PERILS OF 'CARBON SEQUESTRATION'

G. M. Pillai

These days one hears many voices claiming 'carbon sequestration' to be the panacea for reducing CO_2 emissions. The chorus comes mainly from those opposing carbon emission reduction norms imposed under the Kyoto protocol. Instead of 'source reduction' of emissions, the solution being propounded is, "...never mind emissions, we will capture them and make them vanish." This fond hope is a chimera, because, in most cases, carbon sequestration merely 'hides' emissions, and not eliminates them. So what exactly is this esoteric sounding 'sequestration'? Broadly speaking, carbon sequestration refers to efforts for long-term capture and storage of carbon dioxide (emitted by burning fossil fuels) in the terrestrial biosphere, underground, or in the oceans. The efforts underway can be classified into the following categories:

- Utilising natural terrestrial cycles or their enhancement. Eg. planting forests to absorb carbon, injection of carbon into carbon-depleted soil, etc.
- Capturing emitted CO_2 and pumping it underground in geologic repositories. Eg. abandoned or depleted underground mines, oil and gas wells, etc.
- Enhancing the ocean's natural capacity to absorb CO_2 by artificial trace metal fertilisation of marine phytoplankton and injecting CO_2 into ocean depths greater than 1000 metres.
- Genetic manipulation of genomes of microbes to use them as 'absorbents' of CO_2 for production of hydrogen or methane.

On the face of it, all these appear to be wonderful ideas. But the moot question is: we are producing vast volumes of CO_2, so are such measures long-term and reliable or merely short-term remedies to the problem. The first method mentioned above i.e. afforestation is welcome. But with Amazon rainforests being denuded at an astronomical rate to cater to the 'good life' in certain countries, it is hypocritical to talk of planting new forests. Even the existing carbon 'sinks' (I dislike this term – it makes life-giving fertile forests sound like dustbins) are being denuded all over the world. Burying the gases underground in used gas or oil fields is already being done by the Norwegians. But the economic cost of transportation of CO_2 from the point of capture to the location of such geological 'sinks' could be prohibitive. CO_2 could also be injected into underground rock formations, even though there is no guarantee that it will not leak out. In fact, the reported escape of CO_2 from an extinct volcanic lake in Cameroon in Western Africa a few years ago, resulted in suffocating the entire population of a nearby village. So, subterranean injection of CO_2 has limited applicability and has the potential of causing such fatal accidents in the immediate vicinity, as in Cameroon.

The marine options are only wish lists at this stage. Determination of the feasibility, efficiency, and environmental consequences of this process involves significant technological, economic, legal, and scientific investigations. What is certain now is that the oceans are already absorbing an unprecedented amount of CO_2 with lethal consequences for the marine ecosystem. Research done recently by UNESCO's Intergovernmental Oceanographic Commission and International Council for Science's Scientific Committee on Oceanic Research prove that this is increasing the acidity of the oceans. This could disrupt marine food chains and ocean biogeochemistry in ways not yet understood or predictable. Since the marine ecosystem is the cradle of all biota and the human food chain, the consequences for life on earth could be disastrous.

Knee-jerk solutions like carbon sequestration are symptomatic of the mainstream thinking which aims to secure 'business-as-usual,' ignoring the disasters waiting to happen. Unscientific and misplaced optimism is an utterly foolish recipe for calamity. What we need are not such 'cover-up' solutions, but the will to organise a timely transition away from hazardous and unsustainable technologies; 'source reduction' of emissions, not sequestration. The renewable and sustainability revolution is waiting to happen; but we need to take up the challenge head on, before it is too late.