**[Forestry and carbon offsets](https://www.dawn.com/news/1764777/forestry-and-carbon-offsets)**

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THANKS to the use of fossil fuels, coal, crude and natural gas over the past few centuries, the world has seen a massive release of carbon dioxide into the atmosphere. Politicians and business leaders of the developed part of the world are under tremendous pressure to respond to the calamity of climate change. Rich countries are committing to a net zero world; if they make good on their pledge, they will eliminate carbon dioxide emissions emanating from their societal and business functions by 2050. But policymakers still confront the challenge of removing 2.5 trillion tonnes of carbon dioxide emissions already pumped into the atmosphere over the last 200 years.

Currently, the world has two options to remove these emissions from the atmosphere. One option is nature-based and mainly involves the planting of trees and raising forests to sequester carbon. The other option is technology-based and involves the use of machines and engineering hardware pressuring the air to pass through filters which capture carbon dioxide and release only the remaining gases into the atmosphere. Currently, annual emissions are nearly 40 billion tonnes a year while the world’s largest functional engineering-based carbon-capture plant has an annual capacity of a mere 4,000 tonnes. The advocates of both sides — tech- and nature-based solutions — have their own arguments but it can be safely said that, for now, the only workable option is nature-based.

Carbon credit generated from trees and forests is gaining traction internationally. Recently, the Sindh government through the forest department sold one year of carbon credits from the mangrove forests in the Indus delta, earning millions of dollars. It is a 60-year arrangement and the government can continue to earn revenue from carbon offsets for the next 59 years, according to the yearly credits generated and at the rate prevailing in the international carbon trading market. This has created a unique opportunity, arguably, the first of its kind anywhere, whereby a tree or cumulatively a forest is monetarily valuable while still living.

Farmers working in the irrigated plains of Sindh have known for centuries that farming on their lands cannot be sustainable without forestry. This plain truth is also echoed in their folk songs and local tales. However, international trading in tree-/ forest-based carbon offset has created a unique opportunity for them — one in which local sustainability and international climate change needs have converged. If new and innovative business models can be worked out, both local farmers and international companies can be connected and facilitated in offset transactions with farmers through a tech-enabled aggregator model.

There are two options for removing carbon emissions from the atmosphere. But at present, only the nature-based option is workable.

The modern irrigation network in the Indus basin was installed in the second half of the 19th century and continued till the late 20th century, with the most recent barrages — Kotri and Guddu — in Sindh on the Indus river constructed in 1955 and 1965 respectively. The installation of the irrigation network increased agricultural productivity — at the cost of nature which is not our topic of discussion here. However, bringing supplementary irrigation to the soil makes it unsustainable as the absence of functional drainage raises the sub-surface water table rendering the soil waterlogged and unsuitable for farming. Farmers in Sindh have used forests called ‘hurri’ to manage the sub-surface water table. Hurri forests comprise the acacia tree species which is from the leguminosae family and naturally restores nitrogen and fertility to the soil.

I was an observer in a CSIRO Australian researchers’ study on the acacia tree’s water transpiration rate in the Tando Jam area of Sindh in the mid-1990s. The Australians, with their most modern gadgets pinned to tree trunks, found that a five-year-old acacia tree was transpiring as much as 80 litres of water daily in the hot summer months of May and June. The transpiration rates in winter months fell to as low as 20 litres, concluded the study. This scientific study merely confirmed the benefits that farmers were already availing with excellent hurri economics — in some cases better than cash crop economics.

The irrigation networks of Sindh and Punjab are vastly different, with different implications for sustainability. The latter province, barring a few southern districts, has smaller rivers; even those without embankments have no drainage issue. The province has the added advantage of being an overwhelmingly fresh groundwater zone, where water can be reused for irrigation. Hence there is no issue of a rising water table. In Sindh, on the other hand, 80 per cent of the groundwater area is saline and with embankments on the Indus, natural drainage is blocked. The province suffered massively last year in what was wrongly described as ‘floods’ — a more suitable description would have been ‘blockage’ of the natural drainage. The result is that Sindh has massive sustainability issues and is far more vulnerable to the growing threat of climate change.

Nevertheless, Sindh’s tradition of private forestry in the form of hurri is a boon in this age of climate change where farmers can and should be connected through a tech-enabled platform with potential international buyers of forest or tree-based carbon credits. I was able to rescue my farm which was completely submerged last year solely due to the hurri forests of the adjacent farms. The rainwater dumped into these hurri forests of the neighbouring farmland dried far more quickly, without inflicting damage on these forests or causing the soil to become permanently waterlogged.

Farmers in developing countries can be huge suppliers of carbon offsets but it would require a new business idea and model. It may not be a big issue in this age of satellite and tech-based business models, but would certainly require political and policy support. The Sindh government intends to establish a carbon registry in the forest department and that would be huge step in the right direction.

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