

Putting water to work

Scientists looking at 'climate-smart' agriculture for cost-effective flood prevention.

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Following the massive flooding last year, leading scientists are taking a more serious look at how to put excessive flood water into the soil as one of the solutions to help solve future flooding in Thailand and some other Southeast Asian countries.

Pumping water back into the soil is possible and could be an alternative to large dam constructions and water retention development, according to Matthew McCartney of the Vientiane-based [International Water Management Institute \(IWMI\)](#).

Scientists at the institute are now working with the Groundwater Research Center of Khon Kaen University to explore the possibility of doing field research in Thailand. They are looking at the upper reaches of the Chao Phraya River about 100 kilometres away from Bangkok for possible sites, Mr McCartney said.

"In the future, there will be more impacts from climate change, and there will be more excessive rainfall and therefore flooding, so water management will be significantly important," he said on the sidelines of Climate Smart Agriculture in Asia, a conference held recently in Bangkok.

"We should also be looking at storing water in the landscape, not just in large dams but also underground."

According to Mr McCartney, dams do have a role to play in water management but they come with large negative impacts on ecosystems and communities. If people can do some other things as part of a package of solutions to flooding, those impacts can be mitigated, he said.

Water retention in farms, meanwhile, has often proved to also be controversial as it needs vast tracts of land to store excess water, and without proper compensation and therefore consent by farmers, the idea is often opposed.

Without a thorough water management strategy and related systems in place, the water stored in farms would become useless.

This is far different from the idea of putting excess water back into the soil, as scientists are proposing.

Under the concept, known as Managed Aquifer Recharge or MAR, excess water is simply diverted in a "recharge basin" and allowed to percolate into the aquifer, according to Mr McCartney.

However, other technical options are also available, noted the IWMI. For instance, water is allowed to go deep through "flooding pits" or shafts, deep boreholes, or even tube wells.

However, in order to make the most effective use of these approaches, institutional support such as compensation schemes or electricity subsidies for pumping water out needs to be in place, Mr McCartney said.

Combined with a good management programme, MAR not only offers a solution to flooding, but also to drought as farmers can pump excess water out to irrigate water-short farms, he said.

The idea of groundwater recharging is widely popular in India although it is for irrigation purposes.

Mr McCartney said the scientists believe the approach could be used in Thailand to help mitigate flooding considering the country's geography and topography. They are also looking at Laos as a possible location to explore the idea.

But before they come to a conclusion, further studies are needed, he said.

"Many things done in the past don't necessarily work for present situations. We are now thinking of a range of options and combinations for the best result," said Mr McCartney.

Jerry Lengoasa, deputy secretary-general of the World Meteorological Organisation, hailed the groundwater discharge idea as one of the tools necessary for adaptation at a time when climate change is accelerating.

As the region, like the others, is facing a changing climate and weather variability, "climate-smart" agriculture is part of the solutions.

He said water storage is in fact ancient wisdom and if people look back in civilisation, they will find water harvesting was part of daily lives. This can be seen from the Mayan civilisation to Indian civilisations.

Unfortunately, a lot of this ancient wisdom and knowledge was lost.

Mr Lengoasa said that while ground water discharge is necessary, people should not forget that it is just one of a number of tools that are needed to help people cope with water problems.

The bigger challenge, he said, is how to get people to work together when it comes to water issues, across borders when necessary, and to share information when needed.

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