



Thailand is ranked as the world's fifth largest rice producer. So, rice production significantly contributes to the Thai economy. However, current rice cultivation may contribute to environmental problems. Key environmental impacts associated with rice farming may include the following:

- **GHG emissions** from flooded rice fields causing global warming
- **Water pollution** in the nearby water bodies attributable to overuse of fertilisers, herbicides and pesticides
- **Water scarcity** for downstream users owing to high upstream water consumption for rice cultivation, and
- **Soil degradation and air pollution** when burning leftover rice straw and stubble.

These environmental impacts can be mitigated by improving the current farming practices (i.e. efficient use of water, fertilisers, pesticides and straw) towards sustainable agricultural production. These environmental concerns have been overlooked and not yet properly addressed for decades due to a lack of technical knowledge and financial support. In this regard, the Thai Rice NAMA project, a project proposal being developed jointly by BRIA and the Rice Department for funding by the NAMA Facility, will seek to transform the existing rice farming into a climate-friendly rice production system.



Many measures to address these environmental impacts are being evaluated. To date, the following four most feasible mitigation technologies have been discussed for implementation by the Thai Rice NAMA project:

- **Alternate Wetting and Drying (AWD)** is a water-saving technology that farmers can apply to reduce their irrigation water consumption in rice fields without decreasing its yield, according to the International Rice Research Institute (IRRI). In AWD, irrigation water is applied a few days after the disappearance of the ponded water. Hence, the field gets alternately flooded and non-flooded. The number of days of non-flooded soil between irrigations can vary from 1 to more than 10 days depending on the number of factors such as soil type, weather, and crop growth stage. AWD application not only reduces water use in the rice paddy fields by 30% but can significantly lower the methane emissions by about 48% compared to conventional practice according to the 2006 IPCC (Intergovernmental Panel on Climate Change) methodology. Moreover, AWD can reduce pesticide use as it increases the resistance to certain pests. As a result, farmers can eventually save their production costs.

- **Land leveling** to equally distribute water in the rice field and further reduce the uses of water, fertilisers and pesticides,
- **Efficient use of fertilisers** to minimise impacts on water quality and further reduce nitrous oxide emissions, and
- **Enhancing rice straw utilisation** to create value for the straw and avoid carbon emissions from the current practice of open burning.

These selected technologies will be promoted to some 100,000 farmers in the six provinces of Chainat, Anghong, Patumthani, Singburi, Suphanburi and Ayutthaya in the central plain of Thailand. By the end of the Thai Rice NAMA project in 2022, the project could potentially contribute to a reduction of GHG emissions of about 1.6 million tons of CO<sub>2</sub>eq. Moreover, the current situation of water pollution in the nearby watersheds, water scarcity for the downstream users, soil degradation, and human health effects from air pollution could be positively improved as co-benefits through the implementation of these selected technologies.



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