Furthermore, a solution for the management of battery waste needs to be developed to ensure that batteries are properly disposed of or recycled, for example through producer take-back schemes.

Long-term sustainability, replicability and potential for scaling up: Cambodia's approach to advancing low-emission mobility solutions through the uptake of electric motorcycles is sustainable in the long term as it creates an enabling environment for a thriving electric motorcycle market. In economic terms, the operating costs of electric motorcycles in Cambodia are on average 10 times lower than combustion engine motorcycles over a 10-year period. The approach is replicable in other countries as it can be easily adjusted to local circumstances. It also has the potential for being scaled up domestically as it is currently limited to urban areas.

3.1.7. Strengthening climate-resilient agriculture in the Dominican Republic

Participating countries: Colombia and Dominican Republic

Partners: Inter-American Institute for Cooperation on Agriculture

Start of technology uptake process: 2016

Climate technology: SRI

Contribution to NDC implementation: Improved capability to adapt appropriately to climate change and variability in the rice production subsector (Colombia); reduced emissions from rice cultivation through changes in production technology (Dominican Republic)

Further information:
SRI International Network and Resources Center: http://sri.ciifad.cornell.edu.
Project website: https://www.fontagro.org/proyecto/cultivar-mas-con-menos-adaptacion-validacion-y-promocion-del-sistema-intensivo-del-cultivo-arrocero-sica-en-las-americas-como-una-respuesta-al-cambio-climatico.

Climate technology: SRI is an agroecological and climate-smart production strategy based on four key principles: early and healthy plant establishment; minimizing competition between plants; building fertile soils rich in organic matter; and the careful management of water, to avoid both flooding and water stress, and increasing soil aeration. Through this strategy, SRI modifies the management of plants, soil, water and nutrients, thus enhancing resource use efficiency and the productivity of a system while reducing vulnerability to climate change. It is a flexible, knowledge-intensive strategy implemented through practices that are contextualized in response to the needs, priorities and skills of each producer.

Uptake of the climate technology: In Colombia and the Dominican Republic, small-scale farmers play an important role in agriculture and food security. Climate change is causing greater water stress, greater storm damage and increased incidence of crop diseases, all of which impact heavily on small-scale farmers.

SRI was developed by rice producers in Madagascar in the second half of the twentieth century. It is employed by more than 10 million producers in Africa and Asia and is starting to become more known in Latin America and the Caribbean. SRI does not require the use of new seed varieties, synthetic fertilizers or agrochemical crop protection to achieve higher outputs. SRI reduces farmers' needs for seeds and water, and often even for labour, and therefore gives them greater returns from their land, labour and capital. This raises their incomes while also being beneficial for the environment and increasing climate resilience.

Technical experts and farmers from Colombia visited their counterparts in the Dominican Republic to exchange experience on the local context and application of the SRI methodology. The exchange included the participants learning the theory of the SRI methodology and gaining practical insights through demonstrations on a parcel of land. The two sides exchanged data, discussed challenges, jointly identified suitable practices, developed draft protocols for the implementation and monitoring of demonstration parcels of land, and established a process and communication channels for the regular exchange of information. The technical experts together with the farmers then innovated and tested options to identify the most suitable practices for the respective local contexts, recognizing that the change process had to be gradual. Farmers then continued and further improved their tailored SRI approaches. Initial production cycles resulted in increased yields of up to 25 per cent, decreased water use of up to 45 per cent, increased seed use efficiency of up to 96 per cent and decreased production costs of up to 10 per cent. Additional benefits included reduced agrochemical use and reduced crop flattening due to extreme winds. In Tolima Department in Colombia, and in the Dominican Republic, producers experienced up to a 43 per cent and 68 per cent increase respectively in net utility with SRI compared with conventional production.

The endogenous capacities of the technical experts and the smallholders were developed through learning about SRI and applying its principles, including establishing validation parcels of land, making empirical observations and appropriate adjustments, measuring results over time, and communicating the technology to other technical experts and smallholders.

Gender-responsiveness: The project encourages the participation of women in the training and field trips and collects gender-disaggregated participation data on all activities.

Contribution to NDC implementation: The uptake of the SRI technology has been supporting the objective of Colombia's NDC (submitted in 2020) to improve its capability to adapt appropriately to climate change and variability in the rice production subsector. In the Dominican Republic, the SRI methodology has great potential to contribute to the country's NDC (submitted in 2020) target of reducing emissions from rice cultivation through changes in production technology.

Challenges and lessons learned: The many thousands of farmers who have been adapting and implementing SRI in diverse agroecological contexts around the world, combined with the hundreds of peer-reviewed articles published on SRI, have demonstrated that SRI is an effective technology that provides multiple agronomic, environmental and economic benefits. The key challenges to uptake include the need to mechanize production

to ensure cost-effectiveness at larger scales, the need to strengthen the enabling environment, for example to incentivize a reduction in water use, and the need to work with farmers to foster innovation, adapt SRI and facilitate its adoption as it requires multiple changes to conventional production techniques. The latter need is perhaps the greatest challenge.

Long-term sustainability, replicability and potential for scaling up: To ensure the long-term sustainability of the SRI approach, the Colombian National Federation of Rice Producers is committed to integrating SRI efforts into its Broader Massive Adoption of Technology programme, which seeks to increase the agriculture sector's environmental and socioeconomic sustainability in order to increase competitiveness and productivity while reducing production costs. A key challenge to overcome is the need to mechanize production to ensure that SRI is cost-effective, since this requires mechanized planting and weed control. The SRI technology has already been replicated and scaled up across Africa and Asia. Countries in Latin America that have engaged with Colombia and the Dominican Republic on their experience regarding the uptake of the SRI technology, for example Argentina, Chile, Costa Rica, Panama and Venezuela (Bolivarian Republic of), have also started to replicate the experience of their counterparts.

3.1.8. Utilizing ocean energy in Nauru

Participating country: Nauru

Partners: CTCN, Institute of Ocean Energy of Saga University, Overseas Environmental Cooperation Center of Japan

Start of technology uptake process: 2020

Climate technology: OTEC

Contribution to NDC implementation: Achieving water and energy security, and transitioning to renewable energy in the electricity generation sector

Climate technology: OTEC is a technology that produces both energy and desalinated water. Energy is produced by harnessing the temperature differences between surface ocean waters and deep ocean waters. The condensed water resulting from the process is an abundant freshwater source.

Uptake of the climate technology: Nauru is committed to generating 100 per cent of its electricity needs from renewable energy sources by 2050. The country has been increasing its use of solar energy but requires complementary energy sources for achieving its target. At the same time, the country needs to address the increasing climate change induced scarcity of freshwater sources.