

## Technology Fact Sheet

### Plant genetics/plant breeding<sup>i</sup>

#### 1) Technology description

- *High-productivity crop varieties.* Genetic modification and species selection are usually carried out in parallel with the production process. Scientists have been searching for years for new varieties that produce higher yields than the existing ones.
- *Halotolerant crop varieties.* By selecting local salt-tolerant species that thrive in year-round saline habitats, scientists can breed and/or select the genes that define salt resistance in mangrove plants for breeding or revigorating existing mangrove species to create salinity-resistant species.
- *Flood-tolerant varieties.* Partial inundation due to rainfall or sea-level rise occurs very often in northern mountainous valleys, northern and central coastal zones, Southeast and the Mekong River Delta because of the low-lying terrain or inadequate drainage systems. Therefore, it is very important for developing flood-tolerant plants which can adapt to this condition.

#### 2) Socio-economic benefits

- Developing new crop varieties to maintain or improve productivity is an optimal solution to secure food security and respond to climate change.
- Experiments show that salt-resistant crops are able to maintain the same productivity while tolerating higher salinity. From the OM5464 variety created by Tran Thi Cuc Hoa (2011) and Nguyen Thi Lang et al. (2011), three high salt-tolerant crop varieties were developed, namely OM5629, OM5981 and OM7368.
- It is important to carry out sufficient research on the selection and development of flood-tolerant species that can adapt to local conditions to maintain productivity or even increase in constantly inundated areas.

#### 3) Environmental benefits

- High-yielding varieties have higher photosynthetic efficiency, thus increasing crop yields and biomass, which helps to capture more carbon dioxide from the atmosphere.

#### 4) Status of technology

- Some salt-tolerant rice varieties have been created in Vietnam, such as OM5629, OM5981 and OM7368.

#### 5) Application potential

- This technology has been widely applied over the last decade and proved to be effective. In the future, it will be applied for 8.1 million hectares of annual crops and 938 thousand hectares of perennial crops.

## 6) Barriers

- Requiring fast-track implementation on the basis of a long-term development plan that incorporates climate change.
- Inadequate infrastructure due to a low science and technology (S&T) background and unfocused development strategy with too many priorities.
- Lack of genetic materials, hence limited inputs for basic and long-term research.
- Little international cooperation and experience sharing, thus limiting the application of global achievements in Vietnam.
- Developing a new crop variety is very time-consuming. This is considered the most challenging barrier.

## 7) Costs

Implementation and technology application costs

- The cost of construction, procurement of laboratory equipment, research staff.

Incremental costs to adapt to climate change (compared to conventional technology)

- The cost of additional studies of genetic materials suitable.

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<sup>i</sup> This fact sheet has been extracted from TNA Report - Adaptation for Vietnam. You can access the complete report from the TNA project website <http://tech-action.org/>