Technology Fact Sheet for Adaptation

Technologies in the arable farming

A.9. Using Intelligent Nutrient Management- Micronutrient gel[1] for crop and tree [i]	
1. Introduction	This is a new technology for water and fertilizer storage with micronutrients for all types of plants. The technology is efficient in terms of water consumption and labour saving and has the potential to be used in agriculture, forestry and vegetables.
2. Technology characteristics	This technology uses a granulate or powder, which has the ability to absorb and store up to 150 times its own weight in water and then pass this on to plants as required. Once in contact with water, the granulate swells up to form a gel, in order to absorb and store water, which would normally be lost in the soil through evaporation or leaching. The gel is enriched with valuable plant fertilizers, which makes it nutritious and allows the continuous supply of the plant roots with both water and fertilizer. Once the water reserve has been gradually consumed, the gel reassumes its solid form and the process can start again from the beginning. Moreover, it can be repeated over several (6) years. The main characteristics of the gel have defined through experimentation: - 1 kg of gel is capable of storing up to 150 liters of distilled water - Plant can absorb stored water and nutrients through its roots - Micro nutrients absorbed in the gel have a positive effect on soil quality. - It will enable application of mineral fertilizers into soil and ground water to be reduced. - It will reduce irrigation frequency. If the gel is applied in 1 kg per cubic meter of area, sandy soil can store 11-15 % more water; loamy sand – 9-18%; and sandy loam – 11-17%. Evaporation rate will be 3 mm per day (3 l/m^2) and stored water can be used for 3-6 days. - It will shorten germination and growth periods, so it can improve plant growth in dry and desert areas - Crop production is expected to increase significantly
3. Country specific applicability and potential	This technology is tested and its standards and quality have been confirmed in the EU. This technology has the potential to be used in the following sectors: • Agriculture • Forestry, tree and shrub planting in cities and towns • Land reclamation and environment restoration • Vegetation restoration against desertification and degradation • Plant transportation and storage
4. Status of	Preparation for testing in Mongolia is being done.

[1] http://www.aquita.eu/en/aquita/nutrient_management/

technology in country	
5. Benefits and impact on the country development ✓ Economic (Job creation; Investment) ✓ Social (Income generation; Education; Health) ✓ Environmental	This technology assists to increase high production in agriculture, forestry and vegetable gardening sectors. Using the technology in forestry, forest strip protection and agriculture can create jobs. The following benefits characterize the technology: - Improve efficiency of water usage by plants - Increase plant growth, making plants larger, stronger and more resistant and enhance survival capacity - Reduce cost of irrigation and fertilization - Improve yields which lead to increased food security Environmental benefits are: - Reduced fertilizer application - Less fertilizer runoff - Environmentally compatible - Improved soil quality - Counteracts desertification and wind erosion
6. Climate change adaptation benefits	This technology can help to reduce negative impacts of climate change such as desertification and water deficits and increase green house gas absorption.
7. Financial Requirements and Costs	It is difficult to estimate t**he total required funding**. Research and testing expense of the technology; and Gel expense is 0.6-1 USD per tree. The diffusion and implementation of the technology would require 3-5 years.
8. Institutional requirements	Introduction of the technology would not require specific skills and resources. Local farmers and enterprises can apply this technology under supervision and guidance from experienced international experts.

[i] **This fact sheet has been extracted from TNA Report – Technology Needs Assessment For Climate Change Adaptation– Mongolia. You can access the complete report from the TNA project website http://tech-action.org/**