Technology Fact Sheet for Adaptation

Appropriate Breeds Development [i]

1. ***Sector:*** *To be written by sector expert.*	Food
2. ***Technology Characteristics:***	Adaptation
2.1Technology Name:	2. Appropriate Breeds Development
2.2 Introduction: *low/high Brief introduction to the technology*	Both contribution of certain animals to the climate change and extent to which their productivity is affected by the climate change are need to be addressed. The existing genotypes of agricultural animals are to face the direct and indirect consequences in changing environmental conditions through appropriate technological interventions. Reduction of methane emission to ease the GHG effect, building resistance to diseases, pests and environmental stresses to enhance the productivity of animals and quality, health and nutritional value of products could be the main focus. Therefore, the development of appropriate breeds to produce cross breeds as per the national breeding guidelines suitable for different agro-climatic zones with special reference to high lactation yield, environmental adaptability and resistance to diseases thereby enhancing productivity and health of the of dairy cattle while improving the quality of the products
2.3 Technology Characteristics/Highlights: *Few bullet points, ie. low/high cost; advance technology; low technology.*	• Requires advanced technology (genome mapping, biotechnological approaches and involvements) • High cost intervention (Manages large amounts of experiments and time consuming) • Hard technology • Integrated approach in implementation along traditional method
2.4 Institutional and Organizational Requirements: *How much additional capacity building and knowledge transfer is required for the adaptation option to be implemented.*	Building of resource capacities is required in both at the institutional level, i.e. for increasing research output, and at the organizational level, i.e. for facilitating research and for extension of research findings.

3. Operations and maintenance	
3.1 Endorsement by Experts:	Existing farms in the Up Country and the Dry Zone selected for the purpose needs to be strengthen while expanding holding capacity
3.2 Adequacy for current climate: *Are there negative consequences of the adaptation option in the current climate? Some adaptation may be targeted at the future climate but may have costs and consequences under the current climate.*	Improvement of genotypes for better resilience and capacities for a given general and specific environmental context is an approach that is followed by breeders to increase productivity. The specific conditions are combinations of natural and biological factors determined by the local microclimate. In general breeding for such high levels of specificity and the management of such processes is complex and time consuming process. Hence the technological innovations are very much required
3.3 Size of beneficiaries group: *Technology that provides small benefits to larger number of people will often be favored over those that provide larger benefits, but to fewer people.*	Breed improvement is important to ensure uninterrupted food supply and nutritional security under changing climate scenarios. This would also ensure the preserve the sustainability of current production systems of small-holder low input set-up in which majority of the rural farmers find their living. Hence the interventions will benefit large number of people. Further, the technological interventions will ensure the sustainable utilization of indigenous categories where most the adaptation characteristics are preserved through non-directional selection after generations of domestication.
4. *Costs*	
4.1 Cost to implement adaptation options: *Cost measures*	Rs. 325 million for the improvement of a large ruminant breed. The cost varies according to the type of candidate animal considered in breed improvement The cost involves the application of advanced molecular tools and traditional breeding process in establishing improved breeding stock/s

4.2 Additional costs to implement adaptation option, compared to "business as usual":	Proper implementation of the breed structure is necessary with necessary extension and other veterinary and veterinary support services. The continues supply of breeding materials and the improved management conditions necessary to obtain the expected production standards are the key factors to be looked after in implementing the adaption option.
5. ***Development Impacts, indirect benefits***	
5.1 Economic benefits: **Employment -** *Jobs* **Investment -** *Capital requirements*	Employments - More people are attracted for farming. - Job opportunities in value chain - Jobs in service providing and extension arms Investments - Infra-structure - Service sector - Human capacity building - Improvements in resources and facilities
5.2 Social benefits: **Income -** *Income generation and distribution* **Education -** *Time available for education* **Health -** *Number of people with different diseases.*	Income - Generated at rural level, during value addition - Expansion of services at the laboratory levels. Education - Human resource development in the industry - Improved education at rural level with the better income generation Health - Improvement of health of rural people as a result of increased income levels of small-holder sector
5.3 Environmental benefits: *Reductions in GHG emissions,* *Local pollutants,* *Ecosystem degradation etc*	- Low GHG emission - Reduced costing of environment as a result of improved productivity and high adaptability. - Low release of pollutant to the environment as a result of reduced usage of chemicals and drugs

6. *Local context*	
6.1 Opportunities and Barriers: *Barriers to implementation and issues such as the need to adjust other policies.*	- Slow process of implementation 99% farmers are at small-holder low input system. - High cost involvement - Low affordability by rural farmers
6.2 Status: *Status of technology in the country*	
6.3 Timeframe: *Specify timeframe for implementation.*	Molecular approach in identifying genes needs 2-3 year screening of different genotypes Inserting genes by crossing (long process) or gene manipulations (short process) and stabilizing in a population by selection and breeding 4-5 generation - 10 – 15 years
6.4 Acceptability to local stakeholders: *Whether the technology will be attractive to stakeholders*	Yes.

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