Technology Fact Sheet for Adaptation

 Technologies in the animal husbandry

B.3. Selective Breeding of Livestock (High Quality Livestock) [i]	
1. Introduction	Genetic make-up influences fitness and adaptation, and determines an animal's tolerance to shocks such as temperature extremes, drought, flooding, pests and diseases. Adaptation to harsh environments includes heat tolerance and an animal's ability to survive, grow and reproduce in the presence of poor seasonal nutrition as well as parasites and diseases. Selective breeding is a technology that aims to improve the value of animal genetic diversity. As developments have been made over time in improving measurement techniques and methods for estimating an animal's genetic potential, the power and effectiveness of selective breeding as a tool has also increased. Over the last half century it has helped achieve dramatic improvements in the productivity of livestock species as well as improvements in the health and welfare of livestock and other animals.
2. Technology characteristics	Selective livestock breeding is the systematic breeding of animals in order to improve productivity and other key characteristics. Various methods for selective breeding exist: advanced methods such as artificial insemination, transplanting fetuses and transferring egg-cell etc will be used in Mongolia. Key breeding traits associated with climate change resilience and adaptation includes thermal tolerance, low quality feed, high kid survival rates, disease resistance, good body condition and animal morphology. Livestock producers must be able to incorporate long-term planning into production management strategies. Such measures could include: (i) identifying and strengthening local breeds that have adapted to local climatic stress and feed sources and (ii) improving local genetics through cross-breeding with heat and disease tolerant breeds. In 2011, Mongolia had about 36 million livestock. Professional institutions have estimated that about 3 million animals have optimal characteristics of locally adapted, with maximum survival and high production breeds which are called core herds. The technology aims to improve quality of all animals in aimags and soums based on selective breeding using core herds.
3. Country specific applicability and potential	Major legislation such as the National Livestock Program, 'The State Pro-herders Policy', and 'The State Policy on Food and Agriculture' approved by the Parliament of Mongolia aims to improve income and livelihoods of herders through increased livestock production and quality.

	Animal weight would decrease and production drop in Mongolia due to negative impacts of climate change. The research showed that the weight of matured cow has dropped by 14-16 kg, sheep and goat weight has decreased by 5-6 kg and wool yield of sheep has decreased by 90 g in the last 40 years. About 6-8 years will be required to implement the technology.
4. Status of technology in country	Mongolia focuses on rearing livestock which is resilient to natural disasters such as hot and cold weather, drought and harsh winter and adapted to climate change. Researchers of the Institute of Livestock of Mongolia have successfully implemented 3 innovation projects in this field.
5. Benefits and impact on the country development ✓ Economic (- Job creation; - Investment) ✓ Social (- Income generation; - Education; - Health) ✓ Environmental	According to statistics of 2011, there are 328,000 people in 155,000 herding families. They would benefit from the technology implementation. - Jobs such as livestock experts and herders would be created. - Profit from increased livestock can benefit herders. Training can be done in classes as well as distance learning. - State policy of safe and clean food supply to population will be implemented. - Herders would have fewer animals and higher production. Pasture management would be improved.
6. Climate change adaptation benefits	Herders would own the breeds which are resilient to climate change, adapted to local context and possess the highest production. Animal numbers and composition (ratio between sheep and goats play critical role in pasture degradation) can be controlled. Greenhouse gas emissions would be decreased and herders would have access to carbon market.
7. Financial Requirements and Costs	**The total required funding: 2 million USD** From International donors – 1.4 million USD The State budget - 0.4 million USD Private enterprises – 0.2 million USD
8. Institutional requirements	The legal environment is considered suitable to implement the technology. Because it is within the framework of the National Livestock Program approved by the Parliament. Veterinary/ breeding centers have been established in all 329 soums. The centers are responsible for implementing the state policy towards improving livestock quality. Also trainers have been prepared in each soum in order to build herders' capacity and facilitate trainings. A professional livestock department is operating in each aimag with the aim of managing livestock quality and improving operations. Sustainability is ensured

	based on the above mentioned structure and network of the government in order to increase livestock production and improving herders' income and livelihoods through better livestock quality.

[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/**