MMI-Bangladesh A2F+

Training of Trainers on *Moringa* based Cattle Fattening Value Chain

Venue: ASOD Training Centre, Rangpur
Date: 29 October 2019

Organized by: Food and Agriculture Organization (FAO) of the United Nations

in association with
Sara Bangla Krishak Society (SBKS)

"Animals become what they eat, and we, in turn, become what we eat through them."

- Anonymous

***Moringa* is a healthy, safe, economic and effective feed used for cattle fattening that can increase farmer incomes and improve public health outcomes. MMI is providing training and funds to farmers who are working hard to invest in this gem and bring its benefits to their members and communities.**

Moringa (*Moringa oleifera*), commonly known as "drumstick tree", is found in all tropical countries. In Bangladesh it is popularly known as *Sajina*. It is a fast-growing, deciduous tree and every part of it has beneficial properties. It is used for herbal medicine, spices, food, forage and nectar for bees. For MMI farmers in Bangladesh, the best use of *Moringa* is as a feed supplement for animals. Its leaves are highly nutritious with excellent palatability, digestibility and a balanced nutrition composition of protein and minerals. *Moringa* leaves are readily eaten by cattle, sheep and goats.

Experiments shows that *Moringa* is a good source of vitamins A, B and C, nicotinic acid, riboflavin, pyridoxine, folic acid, beta-carotene, ascorbic acid, alpha-tocopherol, calcium and iron, as well as a main source of the essential amino acids. The plant also has anti-inflammatory, antioxidant, antimicrobial and antitumor properties. It has powerful antibiotic and fungicidal effects and the potential to improve nutrition and support immune functions of poultry and large animals. Moreover, *Moringa* reduces *Escherichia coli* and increases *Lactobacillus* counts in the intestine demonstrating an enhanced immune response. Currently there is an increase in commercial use of dried powdered *Moringa* leaf in pill and capsule form as medicine for human consumption. It is also an effective natural bio-pesticide and thus can be included in integrated pest management (IPM) strategies. While *Moringa* is widely used as herbal medicine for humans, it has manifold advantages for livestock, especially for Bangladesh where pasture land is decreasing gradually.

The Sustainable and Joint Initiative for National Advancement (SAJINA), Bangladesh recently conducated a comparative field-trial study on *Moringa* vs. concentrate-based feed for beef cattle. The results showed that a ration consisting of 8 kg *Moringa* silage, 2 kg concentrate and 10-15 kg grass gave similar results as a ration consisting of 10 kg concentrate and 10-15 kg grass. The average daily weight gain was 1.5 kg for both trials. The use of *Moringa* reduced the cost of concentrate by around 70 percent. SAJINA foundation also observed there was no need to use antibiotic and growth promoters (AGP) and there was no sign of gas formation with the cattles fed with *Moringa* ration.

Antibiotic and growth promoter (AGP)-free beef production: *Moringa* is a complete silage solution for safe meat production especially as there is growing concern among consumers about the use of steroids, antibiotics, growth hormones and other chemicals for cattle fattening. During Eid-ul-Adha as well as winter and spring wedding seasons, cattle-fattening drugs and chemicals are widely available in drugstores at cheap prices. The MMI field team found posters of steroids of the Dexamethasone group such as Decason, Dexamet, Paradexa, Oradexason, Adam-33 and Predexanol; intravenous drugs of the Butaphosphan group such as Catophos and Catasol; digestion and appetite

enhancers such as Digimax and Potash; and other vitamin additives. These drugs, mostly smuggled from India, are sold openly at village shops in the absence of monitoring by government agencies. Experts say steroid variants like Decason, Oradexon, Prednisolon, Betnenal, Cortan, Steron and Adam-33 are usually used as life-saving drugs for critical patients. But when fed to cattle, these drugs damage their heart, kidney and liver, and eventually cause death. If someone consumes the meat of cattle fattened with such drugs, it will surely have a negative impact on their health as well. It may even cause cancer and kidney failure. The Animal Feed Act 2010 prohibits the use of antibiotics, growth hormones, steroids or other harmful chemicals in animal feed. For violating this law, a person can face up to one year's imprisonment or a fine of up to BDT 50,000, or both. Many countries, such as member states of the European Union, have banned imports of steroid-treated meat since 2010.

In the wake of public health concerns and considering the significant competitive advantages of *Moringa* and its silage for livestock, especially for ethical, natural and safe cattle fattening practices, members of 19 MMI Producer Organizations (POs) decided to invest in *Moringa*-based safe cattle fattening. This was decided through participatory discussions with members and each FO has prepared an individual group business plan using the FAO RuralInvest toolkit.

MMI technical assistance: the MMI project has extended technical assistance to these 19 POs to promote the *Moringa*-based ethical and safe cattle fattening value chain in Bangladesh. The assistance includes training of trainers on Moringa-based safe cattle fattening, demonstration of *Moringa* (leaf variety) production, establish *Moringa* sapling nurseries, launching revolving finance for community-based safe cattle fattening with 19 POs, as well as making linkages with retail chain shops. While the overall objective of the *Moringa*-based cattle fattening value chain is to increase income for farmers, the specific objectives are to:

- demonstrate and establish a model cattle fattening farm following ethical, safe meat production practices (without using antibiotics, hormones, steroids and other unsafe elements for animals and humans);
- showcase revolving finance for community-based cattle fattening enterprises;
- build technical knowledge and skills on integrated production of *Moringa* and cattle fattening;
- promote *Moringa* leaves as an alternative source of nutrition for both animals and humans, and;
- promote the use of *Moringa* as fodder to lower animal feeding costs.

Exchange visit: At the onset of this initiatve, lead farmers of 19 POs participated in one-day exchange visit to a *Moringa* farm on 28 October 2019 at the Northern Development Foundation (NDF) in Parbotipur, Dinajpur. The NDF is a local NGO that has an on-farm trial on *Moringa* cultivation and silage preparation. Since *Moringa* cultivation is new to Bangladesh, this visit was organized with the aim to introduce PO leaders to *Moringa* cultivation, leaf/stem harvesting, chopping and silage making.

Outcomes of the exchange visit:
As a result of this one-day on-farm visit, participants have:

- ✓ understood the basic concepts of *Moringa* which has manifold advantages for livestock as fodder;
- ✓ learned how to cultivate and harvest *Moringa* leaves and stems;
- ✓ learned methods of chopping, feeding and making silage;
- ✓ understood the multipurpose use of *Moringa* leaves for both human and livestock, and;
- ✓ started to build relationships with *Moringa* experts.

ToT on Moringa-*based cattle fattening value chain*: Following the exchange visit, a ToT was organized for members of the 19 POs comprising following sessions:

- Origin and advantages of using *Moringa*
- Use of *Moringa* for human and animal consumption

- Nutrient composition and benefits of *Moringa*
- Procedure of chopping and feeding *Moringa*
- *Moringa* silage making
- Marketing of *Moringa* fodder and powder nationally and globally
- Ethical practices for safe beef production
- Ethical use of drugs in cattle fattening

Outcomes of ToT:

- Increase of technical knowledge and skill
- Promotion of ethical cattle fattening practices and safe beef production
- Encouragement of neighboring farmers to grow and use *Moringa* to increase their family income

Immediate Impact: after returning home, each participant discussed with other members of their PO and established a demonstration plot of *Moringa* by leasing a 50 decimal plot of land. Altogether 19 demo plots have been established, with 6,000-7,000 *Moringa* plants in each plot. The plots will produce 60-70 metric tons of *Moringa* silage annually. With this, members will be able to feed 120 cattles for fattening purposes.

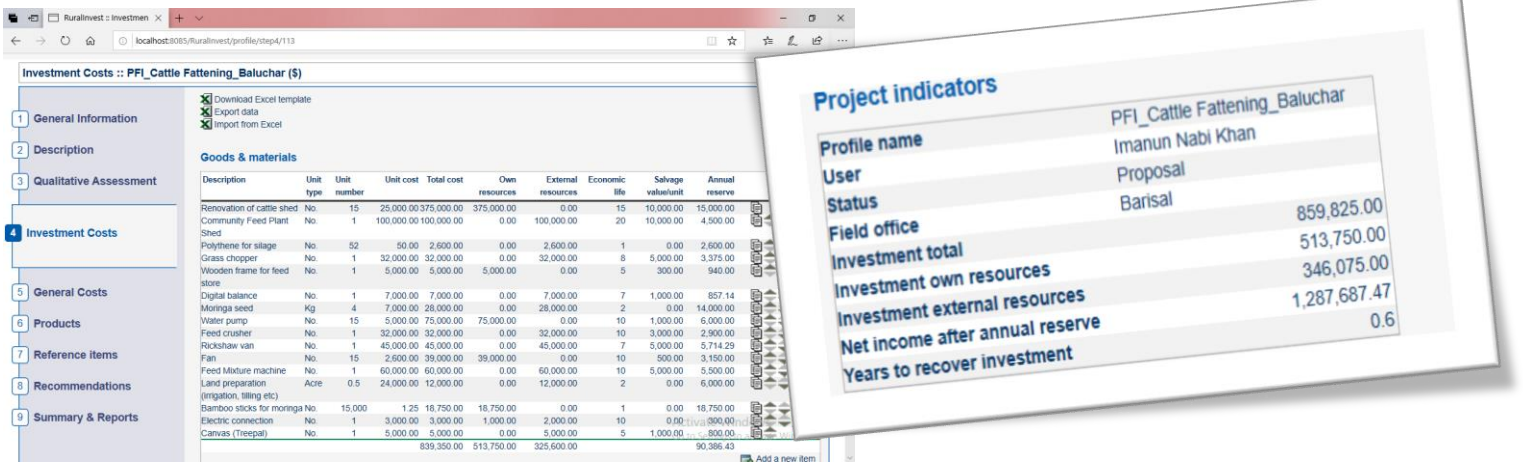
Preparation of business plans: all 19 POs have now developed business plans on *Moringa*-based safe cattle fattening using the RuralInvest toolkit. RuralInvest estimates a return on investment in less than a year. Capital investments will be needed for the establishment of a community based *Moringa* plot, *Moringa* silage unit and mini-feed mill for concentrates. Each PO has applied for a revolving fund of BDT 1,680,000 from the MMI project. Ten percent of this amount will be spent for investment costs and the rest will be revolved among 20 producers for one year. Each PO will rear 40 cattle for fattening per cycle, with 3 cycles in a year. Therefore, in one year they can rear 120 cattle.

Diet Chart for One Cattle in Moringa-based safe Beef Cattle Fattening Program

Days	Concentrate (Kg)	Moringa grass (Kg)	Napier grass (Kg)	Rice straw (Kg)	Other items	Remarks
1-7	1	3	8	2	Deworming (2 tablet)	-Weight record on 1st day -Quarantine for first 7 days
7-15	2	4	10	2	FMD vaccine	-Subcutaneous injection
15-30	2	5	10	2	Appetizer tablet (2 tablet/week)	Weight record on 30th day
31-60	2	5.2	10.2	2	-Appetizer tablet (2 tablet/week) -Liver tonic (20 ml/week)	Weight record on 60th day
60-90	2	5.2	10.2	2	-Deworming (2 tablet) -Probiotic 2 (tablet/week)	Weight record on 90th day
90-120	2.2	5.5	10.5	2		Weight record on 120th day

Feed ingredients amount and nutrient composition for 100 Kg Concentrate

Ingredients	Amount (Kg)	Metabolizable Energy (Kcal/kg)	Crude Protein (%)	Crude Fibre (%)	Ether Extract (%)	Calcium (%)	Phosphorus (%)
Maize	37	1228.4	3.33	0.74	1.48	0.0037	0.0925
Wheat	20	600	2.4	0.48	0.36	0.01	0.062
Rice polish	8	248	0.96	0.4	0.96	0.0048	0.104
Broken rice	10	290	0.4	0.1	0.4	0.015	0.012
Broken gram	11	256.3	3.85	0.55	0.165	0.0275	0.0715
Til/Sesame oil cake	10	213	3.45	1.15	0.85	0.071	0.1
DCP	2	0	0	0	0	0.76	0.23
Common salt	1	0	0	0	0	0	0
Vit-Min. Premix	1	0	0	0	0		
Total	100	2835.7	14.39	3.42	4.215	0.892	0.672



Year-long supply of safe beef to premium outlets of retail chain shops