

MDF: kick-starting a leap in productivity for smallholder livestock farmers in Pakistan

How the MDF programme in Pakistan kick-started a leap in the productivity of small-scale livestock farms between 2013 and 2017.

The initiative developed small-scale production of silage (a non-perishable form of animal fodder). This enabled at least 40,000 smallholder farmers, many women, to significantly increase productivity of livestock and hence incomes.

It involved innovations and investment in appropriately-scaled silage technology and related services, driven by engagement with machinery suppliers, a bank and silage entrepreneurs. This resulted in year-round access to affordable silage and a significant increase in meat production. It also saves up to two hours daily labour for the women who mostly care for livestock.

These changes are being taken up so widely across Pakistan that an entire system of silage entrepreneurs, machine suppliers, rental companies and financial services has emerged.

The market systems perspective

Why livestock farming?

- Livestock is a vital source of food and supplementary income for six million rural households (in which women often play a main livestock husbandry role)
- Urban market demand for meat and dairy products is strongly expanding, with significant potential to substitute imports if reliable year-round production could be established
- Pakistan has the fifth largest livestock population in the world, 80 per cent owned by smallholder farmers, typically with 5 – 10 animals. However, smallholder production and income is low, and massively hampered by scarcity of animal fodder during the two annual dry seasons causing productivity to crash. Animals may lose weight and milk-production literally dries-up for several months.
- Previous efforts to promote year-round access to fodder through ‘silage’ production focused on commercial farmers with large herds and missed the potential for smallholders to participate and benefit

Silage (green foliage crops preserved through fermentation in air-tight bales) is widely used in livestock farming globally. However, conventional bales weigh 300 - 1000 kg and require specialised machinery for production and handling. Until recently, silage-technology (choppers, trolleys, balers, wrappers and related knowledge) and the benefits of affordable year-round access to a non-perishable fodder were unavailable to smallholders in Pakistan.

The underlying reason for this was a failure by machinery suppliers and livestock extensionists to recognise the potential of smallholder livestock farmers (many women) as viable customers, and an unwillingness to take risks to develop and modify technology to suit their needs. They had no strategy or investment plan to reach them.

Interventions that catalysed innovation and behaviour change

MDF Pakistan had a vision for lasting change with widespread impact. This centred on engaging suppliers of silage baling equipment and also relatively local entrepreneurs to produce and market smaller 60 kg silage bales to smallholder farmers. Once the new silage technology, product and business model were proven, MDF looked to engage banks and agri-machinery rental services to further scale up. The three main interventions were:

1. Testing baling technology and the viability of silage production as a business (starting 2015)

Starting in Punjab, and in other provinces after initial success, MDF partnered with small agri-entrepreneurs willing to co-invest in balers, wrappers and the marketing needed to sell small silage bales. A seed company promoting silage-

suitable maize varieties acted as a technical partner, helping new silage makers ensure the quality of their product.

Animal husbandry tends to be a female task, and purchasing silage reduces their workload. Female silage entrepreneurs proved more successful at selling bales to female farmers. Each entrepreneur's outreach was small, hundreds of farmers at best, but the pilot demonstrated the viability of the silage-as-business model.

2. Financial innovation to stimulate investment (from 2016)

Next MDF took a step back. Instead of sharing costs of silage equipment, MDF negotiated a three-way agreement with a leading private bank and Cattlekit (the only small bale silage machinery supplier in Pakistan at that time). Cattlekit reduced the bank's risk by guaranteeing loans for silage equipment, making the loans cheaper for entrepreneurs.

MDF bolstered the agreement by subsidising Cattlekit's rural outreach to engage farmers and promote silage use. This included two rural promotion centres for servicing and providing information about silage-making equipment.

3. Kick-starting machinery rental services for silage-production (from 2016)

Within two years, silage entrepreneurs had started experimenting with the business model: expanding maize cultivation, subcontracting maize farmers, and renting out their silage equipment to increase utilisation rates.

MDF encouraged Cattlekit to enter the machinery-rental business. A small pilot was set up to demonstrate viability and whet appetites, with sets of machinery made available for rent. Demonstrating the rental model through a supplier gave more farmers access to the machinery. Once successful, Cattlekit were well placed to increase the number of machines available.

The logic of how MDF's MSD interventions led to systemic change and impact

MDF's theory of change for this MSD initiative in Pakistan incorporated the following logic:

- MDF's initial partnership with silage entrepreneurs, bank and machinery suppliers demonstrated that small-scale production of silage is a reliable technology and a viable business. This gave all parties involved some insight and confidence.
- The initial success of small-bale silage-producing businesses (and later of machine rental service) in Punjab, led to further growth in fodder supply with significant crowding-in by other silage entrepreneurs and in other provinces.

- › Affordable access throughout the year to nutritious animal fodder enabled farmers to greatly improve animal health, increase productivity of meat and maintain dairy output through the dry seasons.
- › As a result, farmers were able to both expand their herds and increase output per animal. Household incomes increased significantly as sales of milk and meat expanded.

Indicators of lasting market system change and impact

The following results indicate how well MDF's intervention in the fodder sector worked:

Silage producers have become successful businesses

- › By 2017, over 100 small-bale silage enterprises had started operations (copying the initial 12 businesses that MDF supported).
- › These businesses had created approximately 300 new full-time equivalent jobs, just in silage production.

Supplementary feeding has become widespread

- › By 2017, MDF calculated that already 40,000 farming households were using silage fodder to supplement forage during the dry seasons (1.2 million bales sold within two years). Projections indicated this would grow to over 100,000 by 2020.
- › The acreage of land under maize for forage, including land sub-contracted by silage entrepreneurs, had doubled in this time.

Livestock farmers are realising major benefits

- › Milk yields for livestock that are fed silage during the dry seasons typically doubled, with evidence of income benefits going towards additional livestock and household essentials.
- › Women who husband livestock were typically freed from two hours labour each day.

Investment in related farm-activities has increased

- › There was a noticeable systemic impact, with investment by suppliers, a wider range of products (machinery, seed varieties) and services (rental) entering the market, and a diversification of business activities.
- › Farmers are also changing their behaviour, with greater investment in animal welfare, health treatments and nutritional products.

MDF background information

MDF (Phase 1) was a multi-country, market systems development programme, working in Fiji, Timor-Leste, Pakistan, Papua New Guinea and Sri Lanka. It was funded by the Australian Department for Foreign Affairs and Trade (DFAT), and implemented by Cardno Emerging Markets.

MDF supported businesses and other market actors with innovative ideas, investment and regulatory reform that will improve business performance, stimulate economic growth and provide benefits for poor women and men as workers, producers and consumers.

The programme's Results Measurement system was successfully audited as meeting the DCED Standard in 2018.

Achievements in Pakistan (starting from 2014)

- > 24,000 income beneficiary households by 2016
- > Beneficiaries projected to increase to 150,000 by 2020
- > US \$ 13.3 million generated in aggregated net attributable direct and indirect income for farmers, businesses and employees
- > Projected income increases estimated at US \$ 72 m by 2020

- > **MDF (phase 1) programme profile**