

Czech Provincial Reconstruction Team (Logar Province, Afghanistan)

MILK COLLECTION CENTRE CONSTRUCTION GUIDE





Czech Republic Making a Difference in Afghanistan

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INTRODUCTION: DAIRY COOPERATIVE - A COMMUNITY DRIVEN ENTERPRISE

Dairy farming is a common practice in agricultural societies all around the developing world. Milk and dairy products belong to important and full-valued food stuff. In rural communities home produced milk is used as a staple food in farming families.

Milk production is gradually increasing as more and more farmers in Afghanistan are able to produce more than their family consumes. Higher milk production together with increasing demand for locally produced food in urban areas creates a market for rural dairy farmers.

Dairy marketing and regular individual sales of small amounts of milk is difficult and for the majority of rural farmers an impracticable way to sell surplus milk production. A more feasible and sustainable method is through an association of rural farmers under an umbrella of dairy cooperatives. Adairy cooperative founded upon a strong membership base creates a powerful player in the local dairy market.

The FAO program Development of Integrated Dairy Schemes, was one of the most important steps for dairy farming restoration and the establishment of dairy cooperatives on the community level in Afghanistan. This program focused on meeting the urban customer's demand for dairy products from local producers. There have been at least three elemental steps which created a sustainable dairy business in Afghanistan: the construction of a dairy plant in Kabul city; the establishment of a provincial and regional dairy cooperative network; and last but not least, the establishment of a regular and sustainable market for dairy products in urban areas.

Since the beginning of FAO program three dairy cooperatives have been established in Logar Province which collect milk from farmers and send it to the Kabul Guzarga dairy plant on daily basis. These dairy cooperatives are associated under the Kabul Dairy Union.

One more independent dairy cooperative was established in Logar Province but with a different business plan. The dairy cooperative collects milk from farmers on a daily basis, processes it into dairy products (butter, yogurt, cheese) on-site in the milk collection centre, and sells these products in the Kabul market.

Since 2008 Czech PRT has taken over the role of the main donor to agriculture sector development in Logar. The Czech PRT is continuing the already begun process of dairy business development in Logar Province.

During the first year of Czech PRT cooperation with the Logar dairy cooperatives milk collection centre infrastructure improvement was identified as a priority. Capacity of the existing milk collection centres wasn't keeping pace with increasing production and hygienic requirements weren't being met.

The Czech PRT decided to invest in milk collection centre construction projects. The design of these centres was prepared by the Czech PRT together with representatives from the dairy cooperatives and the department of agriculture, irrigation and livestock. All parties did their best to find a simple solution for the construction of community-based milk collection centres.



The objective of this paper is to present the design concept prepared by the Czech PRT and Afghan communities in Logar Province. This design can be used as a guideline for potential Afghan or international donors in the field of dairy business development on how to construct community-based milk collection centres.



1. MILK COLLECTION CENTRE DESIGN

The milk collection centre (MCC) is designed as a U-shaped building closed by a main entrance gate to protect an inner courtyard.

It's composed of two wings. One wing belongs to the administrative section the other to the technology section. Both wings are strictly separated from each other for hygienic reasons. At the end of a corridor the wings are connected by the washroom section.

The central part of the compound is designed as a courtyard large enough to accommodate a medium size truck.

There is a potable water well belonging to the MCC. It's equipped with manual/electric pump connected to the centre's plumbing system. The technology and washroom sections are plumbed and equipped with water taps and stainless steel sinks connected to septic tank with sewage system. There is a water tank on the roof which serves as water storage and to maintain water pressure in the plumbing system.

Each room of the MCC is wired and connected to a diesel generator.



Milk collection centre – inside the old building



1.1 Technology section

The technology section is composed of four rooms:

1.1.1 Milk collection room – registration desk

The milk collection room serves as a milk collection and testing point. Before the milk is purchased, it is tested for freshness (milk acidity), butter fat content, and then weighed. All this information is logged in the dairy book to estimate price. After the milk is accepted, it's poured into a cooling tank.

The room is equipped with a stainless sink and tap with running water in the corner. Right under the window there is marble slab which serve as a laboratory table. This table is at the same level as the sink and connects the sink with the wall next to entrance room.

The milk collection room walls are painted with a washable oil-based paint. The window sill slants for hygienic reasons.

The collection room and storage room are connected by an inner door.

1.1.2 Milk storage room

The milk storage room serves to cool and store the milk before processing or transportation to the dairy plant.

The walls and floor of this room are tiled in white. The window sill slants for hygienic reaons. There is a stainless sink and tap with running water in the corner of the room. There are two doors, the main entrance door leading into the courtyard and the door connecting the collection room with the storage room.

The only equipment in this room is the cooling tank with its electrical Refrigeration unit cooler. Tank capacity is chosen according to the highest daily milk yield during the summer season and the community dairy potential.

The cooling tank is raised above floor level by concrete blocks so that it's possible to accommodate a 40 liter milk can underneath the tank outlet. The outlet is easily accessible to connect to the suction line of milk transport trucks.

1.1.3 Cold technology room

The cold technology room is for cold milk processing: cream separation and butter processing. The room is equipped with a manual/electric cream separator and electricity driven butter churn. Moreover there is a solar powered refrigerator for dairy product storage.



The walls and floor of this room are white tiled. The window sill slants for hygienic reaons. There is a stainless sink and tap with running water in the corner of the room. There is one door leading to the courtyard.

1.1.4 Warm technology room

The warm technology room is for hot milk processing. The room is equipped with a stove and steel pots for simple milk pasteurization.

There are four gas burners, gas cylinders, and canopy digester installed in the room. There is one door leading to the courtyard. Right next to the warm technology room is the power station room with the diesel generator.

The room can be equipped with more sophisticated technology for milk pasteurization in the case of a well developed dairy cooperative.



Milk collection centre – inside the new building



1.2 Administrative section

The administrative section is composed of three rooms:

1.2.1 Guard room

The guard room accommodates the MCC guard.

1.2.2 Management office

The management office is where the daily work of the MCC is done by the management board, finance officers, and people active in milk collecting, processing, and dairy marketing.

1.2.3 Veterinary office/storage room

In the administrative wing of the building there is one spare room which can be used as a veterinary office or storage room.



Milk collection centre – outside the old building



1.3. Washroom section

The washroom section is located at the back of the compound connecting the two wings to form a U-shaped building. There is a milk can washing area equipped with a large trough, tap with running water, two water closets, and one bathroom.

All parts of the washroom section are white tiled.



Milk collection centre – outside the new building



2. INSTALLED EQUIPMENT

The milk collection centre is equipped with a cool storage facility and basic dairy processing equipment. The aim in providing this basic equipment was to decrease dependency of the dairy cooperative on the dairy plant in Kabul and diversify dairy business opportuniiest for farmer communities.



Milk cooling tank

To ensure increased milk shelf life it is necessary to keep it in a cool place. The milk cooling tank is an important constituent of each dairy cooperative. The tank is a practical way to dramatically improve milk hygiene and increase the amount of collected milk.

Dairy cooperatives were able to collect only the morning milking from the farmers due to the challengeof cooling the collected milk. Now farmers in Logar Province are able to sell their surplus from the evening milking as well. Theoretically to the cooperative can double the daily amount of collected milk in the near future by using a milk cooling tank. This fact is important to take in account when estimating tank capacity.

Cream separator

Cream is commonly used in Afghan cuisine. Afghanis obtain milk cream by skimming cream off the milk surface. This is labor intensive and creates a high hygienic risk for the consumer.

The cream separator greatly improves the quality of milk cream and skimmed milk. The MCC in Logar Province was equipped with manual/electric milk cream separator. A capacity of 165 liters/hour was chosen according to the cooperative demand.







Butter churn

Milk cream is processed by shaking fermented cream to get butter. Afghans use different old style shaking equipment with a low hygienic standard.

The MCC in Logar Province is equipped with an electric stainless steel butter churn with a capacity of 50 kilograms.



Solar refrigerator

The solar refrigerator serves as temporary storage for unsold dairy products. It was chosen to reduce the risk of losing product due to electrical outages.





Diesel generator

All milk collection centre electrical appliances together with the lighting system and water pump are powered by a 10 kW diesel generator.



3. BUILDING SPECIFICATION

3.1. Base

Square pad foundations are used to support an individual point load such as a structural column. They are made of reinforced concrete.

Strip foundations (trench fill) are used to support load-bearing walls. They are made of:

- Plain concrete base resting on soil layers. •
- Stone masonry foundation resting on the plain concrete base. •
- Reinforced concrete edge beams resting on the stone masonry foundation. ٠



Foundation Plan



3.2 Super Structure

Structural Elements:

Columns: Reinforced concrete resting on a reinforced concrete base and extending vertically to the level of the ground floor ceiling

Beams: Reinforced concrete resting on the columns at roof level

Reinforced concrete resting on the beams Slab:

Non-Structural Elements:

Walls:	Burnt brick masonry filling the openings between columns
Doors and windows:	First class deodar wood
Floor finishing:	Ceramic tiles or plain concrete covering
Wall finishing:	Painting, plastering and tiling



Ground Floor Plan



3.3 Roof Structure

The roof structure comprises a set of trusses linked by a ridge, top plates and purlins, wooden board, waterproof underlay, roof sheathing, and a GI metal sheet.







Cross Section



4. MCC DRAWINGS







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ABOUT THE CZECH PROVINCIAL RECONSTRUCTION TEAM

The Czech Provincial Reconstruction Team (PRT) has been assisting Logar since March 2008 as part of NATO ISAF. It consists of ten civilian experts (Head of Civilian Team, Project Manager, Agricultural Advisor, three Civil Engineers, Veterinary Doctor, Security Projects Officer, Media Officer, and Finance Admin Officer – all from the Foreign Ministry of the Czech Republic) and 288 Czech Army soldiers.

The Czech PRT is working in conformity with Afghan and provincial core development documents (Afghan National Development Strategy, Provincial Development Program) and in close cooperation with district and provincial authorities. Outside of this, frequent consultations are being held with local communities, elders (shuras) and with development branches of ISAF members, especially the US Army.

The Czech PRT's development strategy is based on long term solutions, which are preferred over quick impact projects. The PRT emphasizes sustainability, Afghan participation, and transparency. Projects are always planned together with the provincial government and on the basis of needs assessments.



Milk Collection Centre Construction Guide



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