

THE MARIAKANI MILK SCHEME

In 1959 the United Nations' Children's Fund showed an interest in the Mariakani Milk Scheme, and suggested that they should provide new equipment for the Scheme by way of a loan, the repayment of which would take the form of the supply of free milk to school children and nursing mothers, which is one of the Fund's objects.

2. The Mariakani Milk Scheme was established in 1948 by the Veterinary Department to enable the disposal of milk produced by Africans in the Kwale and Kilifi Districts, for which purpose a pasteurisation plant was erected at Mariakani from funds provided by the Development and Reconstruction Authority. In 1950 the Plant was handed over to the Kwale and Giriama African District Councils, though the Veterinary Department continued to supervise its operation.

3. The Plant is fed by a syndicate of traders who bring in milk bought at certain points in the Coast Hinterland which is pasteurised for a fee and then transported by the syndicate to Mombasa for sale.

4. The specific objects of the Scheme, which were achieved, were:-

- (a) to provide a cash income to the people of the Hinterland; and
- (b) to provide a cheap, but healthy milk supply to Mombasa.

5. After operation for a period of eleven years the plant requires the replacement of equipment which has now hardly another year's life.

6. Advantage was taken by the Government of the interest shown by the United Nations' Children's Fund in the Scheme, and a mission was sent out by the Fund in 1960 to examine the project in detail.

7. As a result, a draft agreement between the Fund and Government has been prepared (Appendix A). Briefly the draft provides for the erection of a new plant; with the Government providing the building and certain of the machinery at a cost of approximately £34,500 from the Scheme's reserves which are held in the Scheme's accounts maintained on behalf of the two African District Councils concerned who, as is stated hereafter, are regarded as the owners of the plant. These reserves are estimated to be approximately £44,000 at the end of 1960. The Fund in its turn will supply equipment to the value of \$ 137,100; with possible additional equipment valued at \$ 12,650, or about £56,000 in all. It is expected that the installation will be completed and in operation in July 1961; and repayment (by way of issues of free milk which will be distributed by the Ministry of Health & Welfare) will commence in July, 1962, and be completed over a period of eight years. The plant installed will be the most modern and up-to-date in the Colony. The financial prospects of the project are set out in Appendix B; and show that the project will not only repay its loan from U.N.I.C.E.F. but will fully depreciate the plant at the same time.

8. Some difficulty has been experienced in deciding the best way to administer such a scheme, because of:

- (a) some uncertainty on purely legal grounds as to the ownership of the plant which is however regarded as being held by the present Scheme on behalf of the two African District Councils; and

(b) the responsibilities of the Government for the execution of the project, for the loan and for the distribution of milk. It is not possible to establish a board under local government legislation, neither can the provisions of the Marketing of African Produce Ordinance (CAP.184) be applied if it is to be ensured that the responsibilities of the Government are discharged. The formation of a company would delay unduly the execution of the project.

9. It has therefore been decided, after consultation with the Provincial Administration and with the agreement of the African District Councils, that responsibility for the Scheme will be re-assumed by the Government and that it will be administered by the Ministry of Agriculture with the assistance of an advisory board, the composition of which is given in Appendix A, on which local views will be fully represented. At the end of the period of loan repayment, after which the Government's direct responsibilities would end, the position will be reviewed with a view to the creation of a board or company on which local interests would be represented.

10. The Government now intends to proceed to enter into an agreement with U.N.I.C.E.F. on the lines given in Appendix A.

-----

Ministry of Agriculture, Animal  
Husbandry & Water Resources,

NAIROBI.

19th December, 1960.

The Government of Kenya, hereinafter referred to as "the Government", the United Nations' Children's Fund, hereinafter referred to as "UNICEF", and the Food and Agriculture Organisation of the United Nations, hereinafter referred to as "FAO".

Being desirous of obtaining mutual agreement concerning the expansion and development of a milk processing project in Mariakani, Coast Province, Kenya, particularly with reference to the purposes of the project and the responsibilities which shall be assumed by each of the parties,

Declaring that these responsibilities will be fulfilled in a spirit of friendly co-operation,

HAVE AGREED AS FOLLOWS:

ARTICLE I

The Basic Agreement concluded on 7th October 1953 between the Government of Great Britain and Northern Ireland and UNICEF, and the Basic Agreement concluded on 25th August, 1951 between the Government of Great Britain and Northern Ireland and FAO, provide the basis for the relationship between the Government and the co-operating parties in this project. The Articles of this Plan of Operations shall be interpreted in the light of these Basic Agreements.

ARTICLE II

The Government, with the assistance of UNICEF and FAO, has the following objectives in relation to this project.

1. Long-Term Objectives

- (a) To develop a safe and cheap milk supply and improve the nutrition of the neediest groups of the population, especially of mothers and children;
- (b) to promote a sound national policy of milk improvement based on improved animal husbandry, increased production, improved handling by adequately trained personnel, and quality control of milk supported by suitable legislation.

2. Immediate Objectives

- (a) To implement and expand the Government's milk policy within the districts of Kilifi and Kwale and Mombasa;

- (b) To enlarge and re-equip a milk processing plant at Mariakani to process approximately 24,000 litres of milk daily;
- (c) to develop and extend free and subsidized distribution of milk and milk powder from the Mariakani plant to pre-school and school children and pregnant and nursing mothers through;
  - (i) central and local government institutions, hospitals and centres;
  - (ii) voluntary educational and Social Agencies;
  - (iii) schools and clinics run by Municipality and African district councils.
- (d) to administer the project with the advice of a Board, the composition of which is set out below:

Composition of the Board:

Director of Veterinary Services (Chairman)  
 Provincial Veterinary Officer (Deputy Chairman)  
 Provincial Medical Officer  
 Medical Officer of Health, Mombasa Municipal Council  
 District Commissioner, Kilifi  
 District Commissioner, Kwale  
 African District Council Representative, Kilifi  
 African District Council Representative, Kwale  
 Member at large nominated by the Provincial Commissioner  
 Representative of milk producers, Kilifi  
 Representative of milk producers, Kwale  
 Secretary, Milk Traders' Syndicate  
 A Veterinary Officer nominated by the Provincial Veterinary Officer.

- (e) The Government shall do the following:
  - (i) Employ an efficient executive staff to direct the overall operations of the Mariakani Scheme.
  - (ii) Promote the sale of milk and other dairy products.
  - (iii) Register and license all retailers for whom the authority for registration and licensing is not already vested in other competent authority.
  - (iv) Establish sanitary requirements and recommend means for inspection and enforcement.
  - (v) Determine the overall price structure from producer, through all stages to retailer, most conducive to the promotion of the scheme as a whole.

for animal husbandry, dairy management and milk plant operation.

(vii) Change the operating principles which have existed heretofore and to purchase and own milk in order to fulfill its commitments to UNICEF.

(viii) Promote and establish a producers' co-operative if such an operating procedure appears desirable.

### ARTICLE III

#### Plan of Action

1. The Government from the Scheme's accumulated reserves fund will erect all new buildings required for the enlarged plant and will purchase such essential equipment as is required subject to the understanding that the first charge on the reserve fund shall be the maintenance of the working capital as required under para. 26 of this agreement.

2. During the flush season, it is expected that the Mariakani plant will handle approximately 20,000 litres of milk daily. Of this, about 10,000 litres will be liquid whole milk which will be distributed in bulk or packaged form. The balance will be processed into ghee and skim milk powder at the rate of about 70 tons of powder per year. The packing of whole milk will be developed with a view to safeguarding its quality and facilitating wider distribution through increased retail outlets. It is intended that an improved quality and increased quantity of milk will be produced without increasing the present low cost to the consumer (\*).

3. The possibilities for development of toned or other milk utilisation will be explored in Mombasa, and should such a demand appear to exist, the Government will consider introducing any necessary legislation authorising and encouraging the controlled sale or distribution through health institutions of such low-cost milk.

#### Distribution

4. Beginning after the first full year of operation of the enlarged plant the Government will provide for a period of 8 years, liquid milk and skim milk powder for free distribution through Government, African District Council or Voluntary Agency channels, in accordance with a distribution plan to be established on a yearly basis by the Government. The quantity per annum will equal the value of about 12 $\frac{1}{2}$ % of the

---

\* The average retail price of whole milk 3.5% fat in Mombasa during the year 1959 was four shillings per gallon.

milk powder on the yearly average wholesale price in Kenya, and for liquid milk on the actual cost price ex Mariakani Dairy. This cost price to be established as indicated in Annexe I. It is anticipated that additional quantities of milk may be purchased by the Municipality of Mombasa, and other Government and African District Council bodies, for expanded free or subsidised distribution.

5. The Government will undertake the free distribution of the milk which will be made available and which it may purchase additionally in continuation of the present UNICEF-assisted child feeding project for pre-school children and pregnant and nursing mothers through health centres and clinics.

6. The Mombasa Municipal Council will, through its African Trust Fund, continue so long as funds are adequate and attempt to extend its free milk service to schools and will purchase this milk from the Mariakani Milk Scheme at cost price providing milk is not available more cheaply elsewhere. The Municipal Council has set aside a sum of £5,000 for this purpose for the year 1960.

7. Upon completion of the 8-year period of free distribution, the Government will, within the financial limits of the scheme, consider the possibilities of providing up to 30% of its output of milk products at cost price to Government, local government or voluntary agencies for free or subsidised distribution. The Government will, subject to budgetary possibilities, continue these distributions to mothers and children through the school feeding and M.C.H. services.

#### Pricing

8. The price paid to farmers for raw milk and the price at which it will be sold to retailers after being processed at the plant will be determined by the Government.

9. Milk processed by the plant will be sold as cheaply as possible consistent with meeting all the costs of the scheme and any statutory requirements. The Government shall determine the price at which milk shall be sold for free or subsidised distribution to mothers and children.

#### Training

10. Approximately 12 students per year will be trained in animal husbandry and livestock improvement at the Livestock Improvement and Animal Industry Centre in Mariakani, making these students eligible for appropriate employment with the Kilifi and Kwale African District Councils.

11. In addition, refresher courses will be arranged for veterinary scouts already employed by the Kilifi and Kwale African District Councils.

for training can be taken of these practical demonstrations both of animal husbandry and of dairy plant operation.

13. On a territorial scale the Government will develop and co-ordinate its national milk policy through the medium of the Kenya Dairy Board. This will cover progressively all aspects of milk production, processing and distribution, including prices and standards of milk.

#### Target Time Schedule

14. The Government, UNICEF and FAO will, as far as possible, meet the following time schedule:-

Signature of plan of operations by Government UNICEF and FAO	January 1961
Start of new buildings	October 1960
Preparation of contracts by UNICEF	October 1960
Buildings ready to receive equipment	March-April 1961
Installation of new equipment	April 1961
Plant to start expanded operations	July 1961
Repayment distribution to start	July 1962

#### Administration and Assignment of Responsibility

15. The Ministry of Agriculture, Animal Husbandry and Water Resources will assume the overall responsibility for carrying out the objectives of this plan of operations and the Ministry of Health will provide technical co-operation and assistance in carrying out the plan.

#### Reporting

16. The Government will keep UNICEF informed of the progress of the project and, in particular, will forward in duplicate to the UNICEF area office in Kampala the following reports:-

Quarterly progress report covering building construction and plant erection,

Operational reports twice yearly including quantities and prices of dairy products processed.

Quarterly reports of free and subsidised milk distribution.

## ARTICLE IV

### UNICEF Commitments

17. UNICEF will provide within the limits of funds allocated for this purpose by its Executive Board the following supplies and equipment:-

Reception equipment  
Refrigeration equipment  
Pasturisation plant  
Centrifugal clarifiers/separators  
Bulk storage tanks  
Butter churns  
Ghee plant  
Milk powder equipment  
Laboratory equipment  
Yoghourt equipment  
Field cooling units  
Boilers  
(See Annexe II for detailed lists).

18. These supplies will be delivered by UNICEF at the end of ship's tackle at the port of Mombasa, Kenya.

19. The UNICEF commitment pertains only to the provision of the supplies and equipment listed and not to the estimated dollar value thereof.

20. Title of all equipment provided by UNICEF will remain with UNICEF until the milk conservation plant in Mariakani provided for herein is in full operation and the installation has been inspected and found to be operating satisfactorily in execution of this plan. At that time UNICEF will arrange to transfer title to the Government. UNICEF will, however, continue to maintain a technical interest in the plant during the lifetime of this plan of operations with respect to the execution of the plan.

21. UNICEF will provide or arrange for technical assistance and guidance in the installation and operation of equipment provided to the plant.

## ARTICLE V

### FAO Participation

22. FAO will provide additional technical assistance and advice as may be requested by the Government. The Government will place such requests in the highest category.

## ARTICLE VI

### Commitments of the Government

23. The Government will provide or ensure the provision of all personnel, material, supplies, equipment and financing necessary for the execution of this plan of operations except as provided by UNICEF as specified in Article IV.

24. The Government will provide or ensure the provision of:-

- (a) Land for the site of the expanded plant;
- (b) suitable buildings to house the new equipment;
- (c) generators and other plant equipment not provided by UNICEF.;
- (d) labour, materials and supervision for installing all services including steam, water, sewage, electrical power and lighting;
- (e) necessary work surfaces for the plant site such as roads, levelling, fencing, etc.
- (f) erection and installation of equipment, including equipment provided by UNICEF, and local living costs of erection supervisors provided by UNICEF.;
- (g) working capital which shall include a reserve sufficient to cover possible losses during the initial period of expanded operations until the plant is brought into full production.

Recurring items

25. The following shall be considered as integral parts of the basic operational costs of the plant;

- (a) the maintenance of working capital at the level required for meeting normal and unforeseen running expenses throughout the fiscal year.
- (b) The accumulation of reserves for depreciation and replacement of equipment, vehicles, buildings and other capital assets.
- (c) Funds for normal growth and expansion of facilities.

26. The Government undertakes to assure funds for the carrying out of its commitments contained in this plan of operations.

27. The Government will facilitate the import of expendable items required for the operation of the plant, replacement parts for equipment and unforeseen contingency items.

28. The Government agrees to provide UNICEF, at the end of each of its fiscal years for the duration of this project, with a certified statement of actual expenditures incurred in the operation of this project.

## ARTICLE IV

### UNICEF Commitments

17. UNICEF will provide within the limits of funds allocated for this purpose by its Executive Board the following supplies and equipment:-

Reception equipment  
Refrigeration equipment  
Pasturisation plant  
Centrifugal clarifiers/separators  
Bulk storage tanks  
Butter churns  
Ghee plant  
Milk powder equipment  
Laboratory equipment  
Yoghourt equipment  
Field cooling units  
Boilers  
(See Annexe II for detailed lists).

18. These supplies will be delivered by UNICEF at the end of ship's tackle at the port of Mombasa, Kenya.

19. The UNICEF commitment pertains only to the provision of the supplies and equipment listed and not to the estimated dollar value thereof.

20. Title of all equipment provided by UNICEF will remain with UNICEF until the milk conservation plant in Mariakani provided for herein is in full operation and the installation has been inspected and found to be operating satisfactorily in execution of this plan. At that time UNICEF will arrange to transfer title to the Government. UNICEF will, however, continue to maintain a technical interest in the plant during the lifetime of this plan of operations with respect to the execution of the plan.

21. UNICEF will provide or arrange for technical assistance and guidance in the installation and operation of equipment provided to the plant.

## ARTICLE V

### FAO Participation

22. FAO will provide additional technical assistance and advice as may be requested by the Government. The Government will place such requests in the highest category.

## ARTICLE VI

### Commitments of the Government

23. The Government will provide or ensure the provision of all personnel, material, supplies, equipment and financing necessary for the execution of this plan of operations except as provided by UNICEF as specified in Article IV.

A T T A C H M E N T    II

Minimum equipment requirements for re-equipping Mariakani Dairy to handle only bulk pasteurised milk and ghee.

SECTION I:

Reception	\$ 3,000
Pasteurisation clarification	\$ 18,000
Tanks	\$ 5,500
Refrigeration	\$ 18,000
Milk piping, can filler	\$ 3,000
Lab.	\$ 3,000
Steam boiler	\$ 6,000
Diesel generators	\$ 15,000

	\$ 71,500
Freight - 10%	\$ 7,150

\$ 78,650  
=====

Installation

TOTAL	\$ 80,000 =====
-------	--------------------

SECTION II:

Ghee equipment plus freight	\$ 9,000	
Polythene packing	\$ 2,800	
Cold store refrigeration	\$ 3,000	} Freight
Degasser	\$ 2,000	
Transport	\$ 5,000	

TOTAL	\$ 22,800 =====
-------	--------------------

TOTALS OF SECTIONS I & II: \$ 102,800  
=====

If possible to be supplied by UNICEF:-

1 degasser		₹ 2,000
Extra lab. equipment		₹ 2,000
Cheese vat - 2,000 litres		₹ 2,000
Transport:		
1 Land Rover	)	
1 1½ ton pick up truck		₹ 5,000
		<hr/>
		₹ 11,500
Freight - 10%		₹ 1,150
		<hr/>
TOTAL		₹ 12,650
		=====

B. Scheme Investment

I. Buildings etc.	£20,000 =	₹ 56,000
II. Electrical fittings ) piping, etc. )	£ 6,000 =	₹ 16,800
III. Diesel generators, 2 x approx.120 Kw.	£ 7,500 =	₹ 21,000
IV. 2 polypack machines	£ 1,000 =	₹ 2,800
	<hr/>	
	£34,500 =	₹100,000 approx.
	=====	<hr/>

Mechanics subsistence Allowance : ₹ 750

---

Contingency allowed for by trading  
in existing diesel engines £2,000

Depreciation and loss of interest  
on this capital:-

4% on £20,000 = £800

10% on £ 6,000 = £600

15% on £ 7,500 =£1,125

30% on £ 1,000 = £300

Average interest  
loss 2% = £690

---

£3,515

=====

A T T A C H M E N T I

A. Equipment proposed to be supplied by UNICEF:

1. Reception:		
	Dump tank - 2,000 litres	} \$ 8,000
	Can washer - $\frac{3}{4}$ per minute	
	Drip Tray	
	Roller conveyors	
2. Pasteurisation:		
	Pasteuriser - 5,000 litres/h.)	} \$ 19,000
	Clarifixator	
	Separator	
	Steam chest	
	Cleaning unit	
3. Storage tanks:		
	2 x 10,000 litres )	} \$ 9,000
	1 x 5,000 litres )	
4. Refrigeration:		
	2 x 90,000 k.cal/h	\$ 18,000
5. Milk piping and Can filler		\$ 6,000
6. Lab. equipment		\$ 3,000
7. Drying equipment, 1000 litres/h.:		
	Preheater plus pump )	} \$ 18,000
	Milk piping	
	Balance tank	
	Condensate pump	
	Roller grinder	
	Knife grinder	
8. Butter/Ghee equipment:		
	Cream vessel - 2,000 litres )	} \$ 8,500
	Churn - 500 litres working capacity	
	Cream pump	
	Ghee pot - 500 litres	
9. Yoghurt processing vessel - 2,000 litres		\$ 2,500
10. Cold store refrigeration - 9,000 k.cal/h.		\$ 3,000
11. Steam boilers, 2 x 80 H.P.		\$ 18,000
13. Field cooling		\$ 8,000
		\$121,000
	Total	\$121,000
	Freight,	
	10%	\$ 12,100
	P.M. Installation	

TOTAL: 284.9  
=====

NOTE:

1.	Cost price pasteurised milk	267.67	cts/gallon
2.	Delivery and general costs	31	cts/gallon
		<hr/>	
3.	Cost price Mombasa	298.67	cts/gallon
4.	Proposed selling price	300.00	cts/gallon
5.	Margin	1.33	cts/gallon

---

Depreciation, amortisation loss of interest	32.5
Preprocessing of milk (steam, electricity, water, labour, milk losses, maintenance, field cooling)	17.7
Drying steam	18.8
Drying electricity	2.4
Drying labour	3.4
Drying packing (bags)	4.5
Drying maintenance etc.	2.0
Total	<u>81.3</u>

C. Costs on ghee per gallon in cents

Depreciation etc.	8.7
Cost of packing in tins	4.5
Steam	0.5
Labour	3.3
Electricity	0.15
Maintenance and Water	0.85
Total	<u>18.00</u>

D. Extra costs for packing milk:  
(over pasteurised milk)  
in cents per gallon

Polythene	42.4
Depreciation, etc.	19.0
Labour	2.5
Operating cold store	3.0
Maintenance	2.0
Total	<u>68.9 = 70 cts/gallon</u>

REVIEW OF OPERATION IN MILLION

CENTS

1. Pay to producers: 1,100,000 at 150 gall. cts. = 165 ==	1. Cost price pasteurised milk 900,000 x 267.07 gall. cts. = 240.9 =====
2. Costs: Processing Pasteurised milk 900,000 x 60 gall. cts. = 54	2. Selling Milk Powder (200,000 gallons) 150,000 x 120 lbs. cts. = <u>18</u>
3. Costs: Processing ghee and milk Powder 200,000 x 100 gall. cts. = <u>20</u>	3. Selling ghee (at 4%) 80,000 x 325 pounds = <u>26</u>
4. Pay to Trader: 900,000 x 51 = <u>45,9</u> 200,000 x 0 = <u>0</u>	

This is to be distributed as follows:-

On pasteurised milk	£8,500
On drying	£2,500
On ghee/butter	£ 800
On packed milk	£ 250
	<hr/>
	£12,050
	<hr/>

C. On \$ 100,000 Scheme capital:

Per year £3,515

This to be distributed as follows:-

On pasteurised milk	£2,000
On drying	£ 750
On ghee	£ 65
On packed milk	£ 700
	<hr/>
	£3,515
	<hr/>

D. Capital costs per year per gallon of milk in cents

1.	On pasteurised milk:	23.3	on 900,000 gallons
2.	On drying:	32.5	on 200,000 gallons
3.	On Ghee/Butter:	8.7	on 200,000 gallons
4.	On packed milk extra over 1:	19.0	on 100,000 gallons

#### PROCESSING COSTS

A. Costs to process pasteurised milk per gallon in cents:

1.	Depreciation, amortisation and loss of interest	23.3
2.	Management	6.7
3.	Administration	7.8
4.	Milk Losses	5.0
5.	Steam, electricity, water and labour	8.7
6.	Maintenance, detergents, etc.	3.0
7.	Field cooling on 20% of milk	1.0

Total ..... 

---

55.5

Allowance . 

---

4.5

---

60.0 ct/gall.

## OF THE PROPOSED NEW MARIAKANI MILK PLANT

1. Capital investment to construct and equip a modern milk processing plant at Mariakani (Kenya).

### PLANT SPECIFICATION:

The Plant to handle, initially, 5,000,000 litres (1,100,000 gallons per year) with a daily intake varying from 10,000 - 20,000 litres per day (2,200 - 5,000 gallons per day).

Allowance is provided for emergency intakes of up to 30,000 litres (6,600 gallons) per day.

Initially the milk to be processed into:

- (a) 800,000 gallons pasteurised milk (bulk despatched).
- (b) Packed pasteurised milk (100,000 gallons) in polythene bags (if this type of packing proves to be suitable).
- (c) Yoghurt and white cheeses if desirable.

The seasonal milk surplusses, initially 200,000 gallons, to be processed into ghee, butter and milk powder.

The design of the building allows for future extensions.

Equipment for trials on milk cooling on the intake routes, with the object of improving the milk quality and extending the milk intake is included.

### INVESTMENT:

UNICEF approximately:           \$ 150,000 = £53,570  
Dairy Scheme approximately:   \$ 100,000 = £35,700

For details see Attachment I.

### CAPITAL COSTS PER YEAR

#### A. Basis of Calculation:

Depreciation on machinery and equipment	10%
"          " diesel generators	15%
"          " buildings	4%
"          " electricals, piping, etc.	10%
"          " polypack machines	30%
Amortisation Unicef capital	12.5%
Average loss of interest on scheme capital	2%

B. On \$ 150,000 Unicef Capital:  
Per year \$ 33,750 = £12,050

Final Provisions

29. This plan of operations shall come into effect upon signature by the parties and will remain in effect from the start of expanded production in the plant, it being understood that the objectives stated in Article II remain the Government's permanent objectives with regard to this project.

30. This plan of operations may be modified by mutual consent of the Government, UNICEF and FAO.

DONE IN SIX COPIES IN ENGLISH.

At \_\_\_\_\_ on \_\_\_\_\_  
For the Government of Kenya

At \_\_\_\_\_ on \_\_\_\_\_  
For the United Nations'  
Childrens' Fund

At \_\_\_\_\_ on \_\_\_\_\_  
For the Food and Agricultural  
Organisation of the United  
Nations