I. LABOUR INPUT

Labour input can be divided into three types i.e., family labour, permanent hired labour and casual hired labour.

a) Family Labour

Estimation of labour units of the family workers and their cost estimates is a very difficult task. Such labour is usually unemployed or underemployed to varying degrees. Besides sex, it falls in many age groups. To avoid any over or under estimation, family labour cost can be estimated as follows:

First of all, percent time spent on the farm for crops and livestock by each of the family members needs to be ascertained. These fractions can be converted into adult male units as follows:

Male worker age 16 to 60 years	= 1 adult unit
Male worker over 60 years	= 0.50 adult unit
Male workers between 12 & 16 years	= 0.50 adult unit

Females may be taken as 0.75 of the male in the concerned age groups given above.

The opportunity cost of family labour may be taken to be equal to the earnings of a permanent hired labour if any, or

according to the rates prevalent in the village for the permanent hired labour. A family labour unit can be a perfect substitute for a permanent hired labour unit in an effective and satisfactory manner. Therefore, a family labour unit can earn at least as much as a permanent hired labour unit earns in the village.

b) Permanent Hired Labour

Cost of permanent hired labour employed on the farm may be estimated by adding the following cost items:

i) amount paid as cash;
ii) value of wages paid in kind;
iii) value of food provided;
iv) value of cloths provided;
v) value of shoes provided; and
vi) value of other miscellaneous payments.

Using this procedure, total labour cost (of family and permanent hired labour) can be estimated for the whole year. Total working hours of these two types of labour needs to be estimated by taking into consideration the operations performed and the time spent on each operation for each farm enterprise. The cost of the above labour may be apportioned to various enterprises on the basis of working hours spent on each of them. Cost per working hour can be derived by dividing total labour cost with the total working hours. If per hour cost is multiplied by labour hours spent on each enterprise, it gives the labour cost for that enterprise.

Before apportioning labour cost to various types of livestock, these may be converted into adult animal units using the following rations conversion ratios:

Production Animals	Animal units
Adult cow	0.72
~~Young cow~~	0.54
Adult buffalo	1.28
~~Young Buffalo~~	0.96
Work Animals	
Bullock	1.0
Donkey	0.57
Horse	1.00
Camel	1.57
Other Livestock	
Sheep	0.20
Goat	0.20

c) **Casual Hired Labour**

Actual payment made to the casual hired labour, if any, may be charged as such to the enterprise for which it was engaged.

To arrive at the net cost, value of farm yard manure produced by the animals needs to be deducted from gross costs.

II. CAPITAL INPUT

i) Interest and Depreciation on the Value of Milch Animals

Depreciation charges for milch animals can be computed by taking the difference in their value at the beginning and that at

the end of the year. One major criticism to this method of calculation is that of the increase in the value of milch animals due to appreciation in their prices upto a certain age of milch animals. Another objection to this method is that the value of a milch animal is a function of age and time of parturition. It is quite possible that an animal may be dry at the beginning of the year and turns wet at the end of the year. The time of parturition consequently affect the value of milch animal. In order to overcome these problems, depreciation may be charged at the rate of 5.50 percent on the average value of the animal during the milking period.

In most of the cases, the farmers do not dispose off the milch animals when they go dry, rather they keep them on their farms. On calving again, the animal becomes as valuable as it was at the time of previous calving. There is, therefore, no depreciation in the price of the animals between two calvings. However, maintenance cost for that period is involved. Such maintenance costs during the dry period may be estimated and be taken as the true cost of milk production instead of the depreciation cost.

Interest could be charged at the level of opportunity cost, which in Pakistan ranges between 12 to 14 percent on the average price obtained during the maximum and the minimum prices of the animal.

ii) Interest and Depreciation on the Value of Shed

In rural areas, animals including the milch animals are commonly kept under the same shed. For the purpose of cost estimation, depreciation should be charged at the rate of 2.5

percent and 5 percent of the current construction cost of the "pacca" and the "katcha" sheds, respectively; while the interest is charged at the rate of 12 percent (depending upon the opportunity cost of capital. Animal shed costs can then be apportioned to various animals, on the basis of adult animal units, using the following formula $MF = SC \times \frac{MA}{TA}$

Where

MF = The Shed cost for milch animals.

SC = The total shed cost in rupees.

MA = The milch animal units.

TA = The total animal units.

iii) Green fodder and dry fodder

Total cost of green fodder can be calculated as

$$TCG_f = \sum_{i=1}^{N} FF_i \; PF_i - \sum_{i=1}^{N} FS_i \; PR_i + \sum_{i=1}^{N} FP_i$$

Where

TCG_f = Total cost of green fodder fed to livestock,

FF_i = Area under ith type fodder on the farm,

PF_i = Prevailing price per acre of ith fodder in the village in rupees,

FS_i = Area under the ith fodder grown on the farm but sold,

PR_i = Price per acre received for the ith type of fodder sold,

PF_i = Area purchased of the ith fodder and

FP_i = Price per acre paid for the ith fodder purchased.

Similar procedure can be used for estimating the cost of dry fodder fed to all animals. The share of milch animals can be derived from the total cost on green and dry fodder by using the following formula

$$CMA = TCF \times \frac{MA}{TA}$$

Where

CMA = Cost of green and dry fodder fed to milch animals in rupees,

TCF = Total cost of green and dry fodder fed to livestock,

MA = Milking months and

TA = Total animal months.

iv) Concentrates

The value of cotton-seed cake, cotton seed, ghee, oil, etc., fed specifically to milch animals may be taken as the cost of concentrates.

v) Labour Cost for Maintenance

Labour use for the livestock sector is a function of variables like fodder cutting, chaffing, feeding, watering, milking, etc. Total labour used in livestock sector can be estimated as

$$THL = \sum_{i=j}^{2} \sum_{j=i}^{n} X_{ij}$$

Where

THL = Total hours spent on the livestock sector and

X_{ij} = Total hours spent on livestock sector in the ith season for the jth operation.

Absolute amount of the labour used for milch animals from the common employment of labour for all animals can be estimated by using the following relationship

$$MLH = THL \times \frac{DA_i}{TA}$$

Where

MLH = Labour used for milch animals,
THL = Total hours spent on livestock sector,
DA_i = Standard milch animal months,
TA = Total standard animal months.

Family labour and permanent hired labour cost for wet animals can be derived by using following relationship

$$MLC = LH \times CA.$$

Where

MLC = Labour cost of milch animals,
LH = Total manual hours of family labour and permanent hired labour spent on milch animals and
CA = Cost per man hour.

Actual payment made to the casual hired labour was apportioned to the milch animals in proportion to its use.

vi) Interest on the value of Land

An interest rate of 12 percent (depending upon the opportunity cost of capital) may be applied on the value of land used for tying the animals on a given piece of land. This interest cost should be allocated to different animals categories, following the procedure given for the shed cost.