Design of Cost Effective Silo Structure

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Abstract- When fodder production falling, the rates of fodder increases. This has forced farmers to ask the government to start fodder camps and every time setting of fodder camps would not be complete solution. In this view study is undertaken at College of Agricultural Engineering Technology ,VNMKV,Parbhani. Design silo survey work of Goushalas undertaken and according to population design diameter fof Silo has worked out. For animal population of Goushalas 62,35,284,216,130,115 & 111 workout diameter of the silo are 4.16,3.19,5.4, 5.67, 5.99, 5.02, & 5.20.The cost estimation for unit I, II, III, IV,V,VI, & VII workout at 156289, 111442, 634500, 448434, 230752, 387664 & 193774.Monogram shows diameter of silo , Cost Estimation of silo and animal population found suitable to work out design for any animal population.

Key words: Silo, Goushalas, Eastimation , Animal Population

Introduction

Silage is fermented, high-moisture stored fodder which can be fed to cattle, <u>sheep</u> and other such ruminants or used as a biofuel feedstock for anaerobic digesters. It is fermented and stored in a process called ensilage, ensiling or silaging, and is usually made from grass crops, including maize, sorghum or other cereals, using the entire green plant . Before design of silo for fodder storage purpose Survey of fodder storage structures at Goushalas in Marathwada region needs to be carried out. With Objective such as Survey and Design Silo for Various Animal population,Cost Estimation for various type of Silo and Performance Evaluation Silo structure for fodder quality and storage period.

Methodology

Design Silo for various Animal Population in Goushalas of Parbhani district.

Table 1. **Animal population in different case**

Sr. No.	1	2	3	4	5	6	7
Case	I	II	III	IV	V	VI	VII
Animal Population	62	35	284	216	130	115	111

Study of fodder management and housing system, CASE-1

1) <u>Name of Goshala</u> - Vedant Bhudeshiya Sevabhavi sanstha

2) <u>Name of Contact Person</u>- Indrajit Ravsaheb Kadam

3) <u>Mobile no</u>. 9657001396

4) <u>Address</u> - Dharmapuri, Tq. Dist. Parbhani.

5) <u>Name of animals</u>-

Sr.No.	Breed	Number of animals
1	Cow	30
2	Cow Bull	5
3	Cow calf	11
4	Buffalo	9
5	Buffalo calf	7

6) <u>Housing structure</u> –
    1. 3 sheds of 60*15 for cow and buffalo.
    2. 1 shed of 30*15 for cow calf and buffalo calf.

7) <u>Housing expenditure</u> – Approx. 10 lacks for all shades.

8) <u>Labour requirement</u> – 5 Labours, 1 Manager

9) <u>Labour expenditure</u> – 5*400 = 2000 per day. Total = 5,00,000

10) <u>Fodder management</u>-

    1. Green maize on 5-acre land.
    2. Dry fodder of jawar and dry harvested crop.

11) <u>Fodder expenditure</u> - 4 Lacks per year.

12) <u>Other expenditure</u>- 30-40 thousand expenditure on medicine per year.

13) <u>Total expenditure</u> - 19 Lacks

14) <u>Total income</u> – 15 Lacks

15) <u>Benefit-cost ratio</u> – 5:9

Design for case I

Animal Breed	Body Wt.	No of Animals	Rate of feeding per kg of body Wt.(Kg)
Cow	450	30	3
Cow Bull	500	5	3.5
Cow Calf	180	11	3
Buffalo	480	9	4
Buffalo Calf	180	7	3

CASE-2

1) <u>Name of Goshala</u> – Gokuldham Goshala

2) <u>Name of Contact Person</u>- Uddhav Gangadhar Giri

3) <u>Mobile no</u>. 9923555155, 8806400835

4) <u>Address</u> – Takli, Tq. Dist Parbhani.

5) <u>Name of animals</u>-

Sr.No.	Breed	Number of animals
1	Cow	15
2	Cow Bull	3
3	Cow calf	7
4	Buffalo	7
5	Buffalo calf	35

6) <u>Housing structure</u> –

    1. 2 Sheds of 50*15 for cow and buffalo.
    2. 1 shed of 30*15 for calf.

7) <u>Housing expenditure</u> – 7 lacks.

8) <u>Labour requirement</u> – 2 labours

9) <u>Labour expenditure</u> – 2*400 = 800 per day. Total = 2,00,000.

10) <u>Fodder management</u>-

  1. Maize on 2-acre, green grass on 1 acre.
  2. Stored dry harvested material of soyabean and chana.

11) <u>Fodder expenditure</u> - 4 lack per year.

12) <u>Other expenditure</u>- About 10-15 thousand per year for medicine.

13) <u>Total expenditure</u> - 13 Lacks

14) <u>Total income</u> -11 Lacks

15) <u>Benefit-cost ratio</u> – 5:6

Design for case II

Animal Breed	Body Wt.	No of Animals	Rate of feeding per kg of body Wt.(Kg)
Cow	450	15	3
Cow Bull	500	3	3.5
Cow Calf	180	7	3
Buffalo	480	7	4
Buffalo Calf	180	3	3

Diameter of silo for various animal Population

Unit	1.	2.	3.	4.	5.	6.	7.
Animal Population	62	35	284	216	130	115	111
Diameter of Silo	4.16	3.19	5.40	5.67	5.99	5.02	5.20

Monogram of Animal population ,cost Ratio and dia of silo
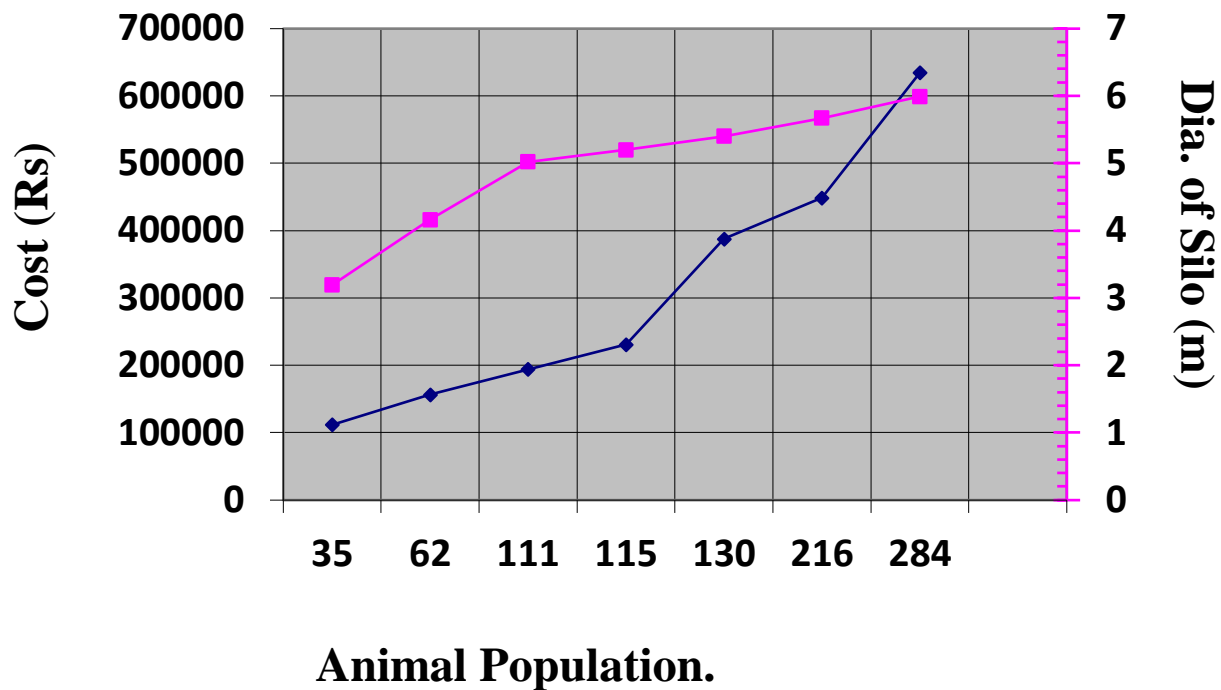
Animal Population.

Conclusion

1. For animal population of Goushalas 62,35,284,216,130,115 & 111 workout diameter of the silo are 4.16,3.19,5.4, 5.67, 5.99, 5.02, & 5.20

2. The cost estimation for unit I, II, III, IV,V,VI, & VII workout at 156289, 111442, 634500, 448434, 230752, 387664 & 193774.

3. Monogram shows diameter of silo , Cost Estimation of silo and animal population found suitable to work out design for any animal population.

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