

# WHAT ARE THE COSTS OF THE MATERIALS OF A SMART SUSTAINABLE COWSHED EQUIPPED WITH A GREEN ROOF?

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# Map

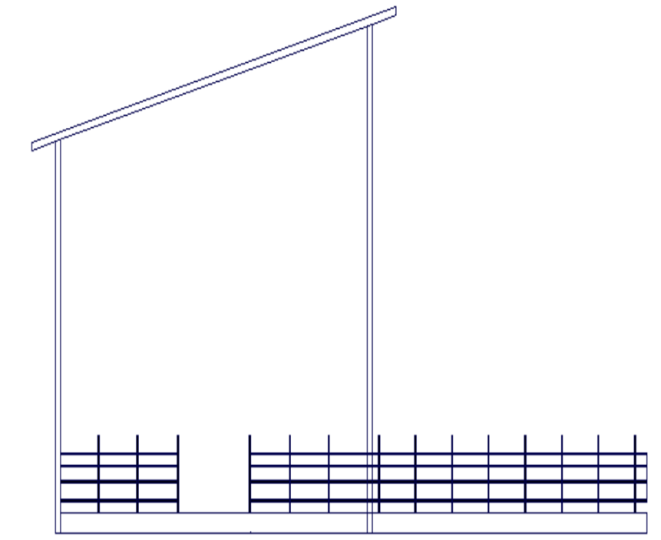
What are the costs of the materials of a smart sustainable cowshed equipped with a green roof?

1.THE SCHOOL COWSHED



2.THE INNOVATIVE COWSHED

3.ESTIMATIVE METRIC COMPUTATION



# The school cowshed

The school cowshed has the following characteristics:

- width: 13m
  - length: 26m
  - height: 10m
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- The school cowshed is a traditional cowshed where production costs are high with a low level of animal welfare.
  - In this project, in fact, we want to analyze the costs that must be incurred for the construction of an innovative cowshed or, better still, an ethical cowshed.





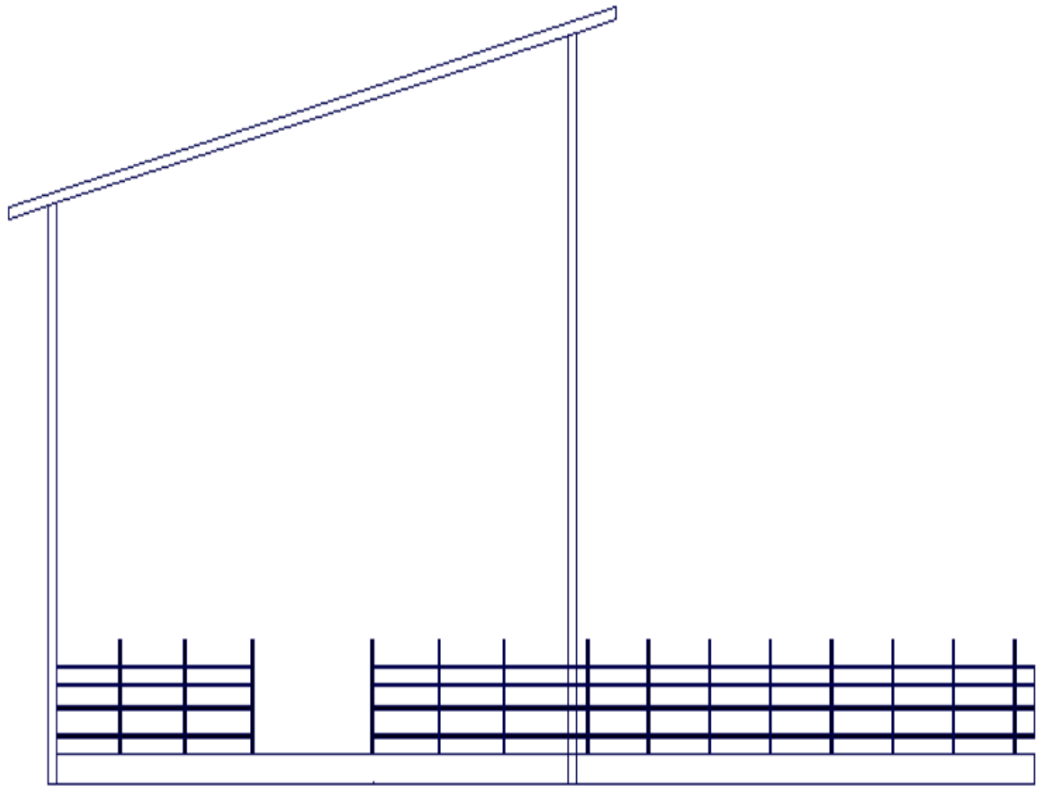
n. 1 – the school cowshed



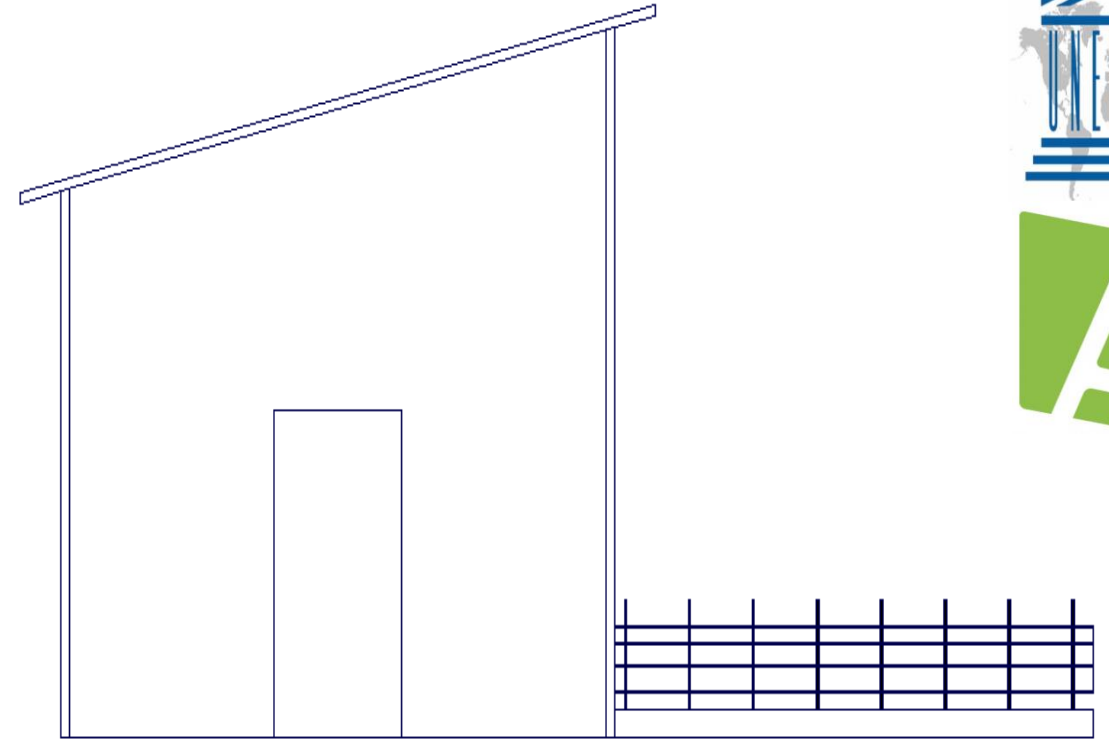
n.2 – the school cowshed

In these two photos it is possible to observe the current school cowshed.  
In particular, in the first one you can see the side part of the cowshed, and the second one is the top view.

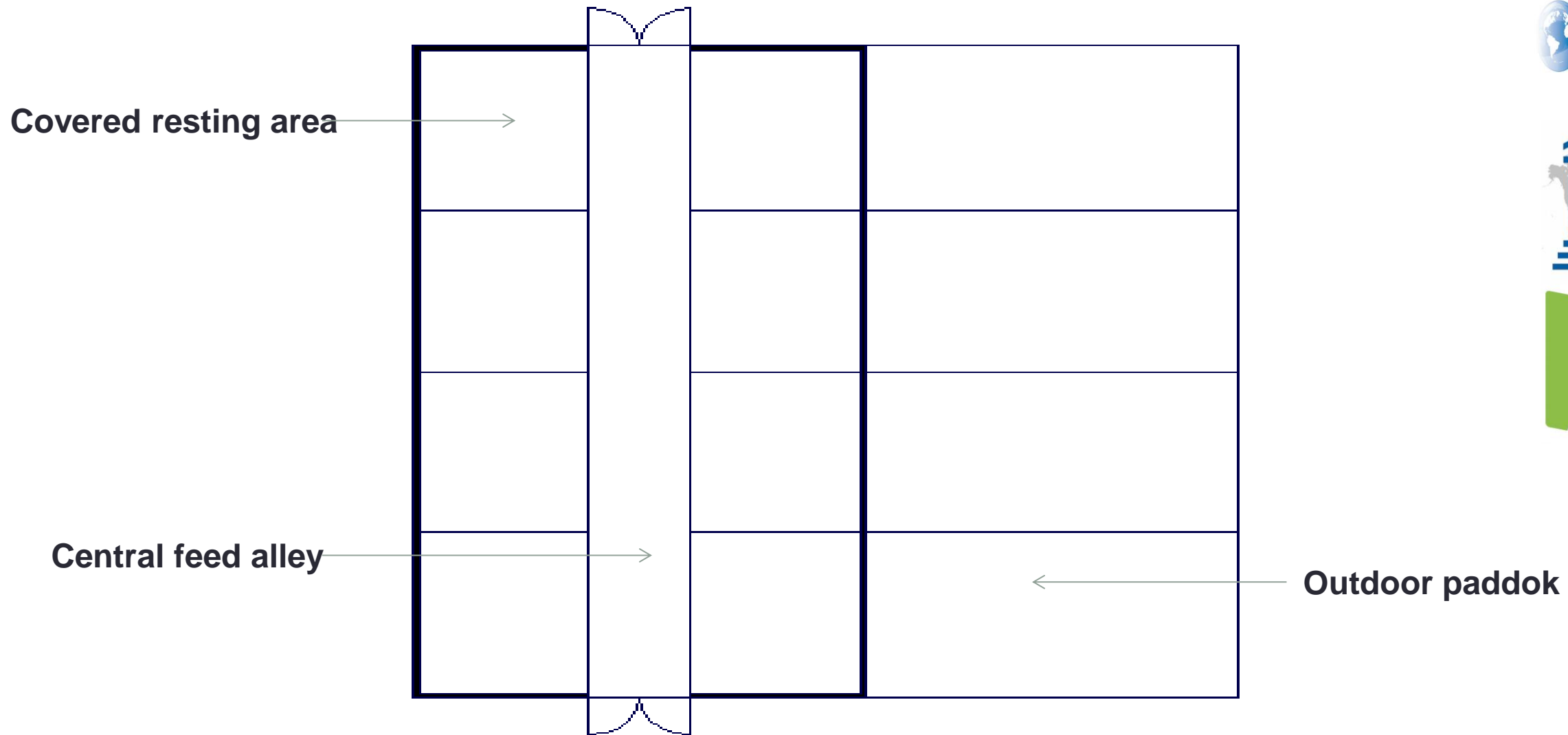
# The innovative cowshed



n.3 – The innovative cowshed







n. 4 – The plan of cowshed

The innovative cowshed has been subdivided into three main areas:

- **Central feed alley**, which serves to administer food
- **Covered resting area**, is a space where cows can show their natural behavior
- **Outdoor paddok**, which guarantees freedom of movement and also allows integration between animals and the external environment.

The **lighting** is natural in order to satisfy the physiological (light / dark) and behavioral needs (reduction of aggression).

The **ventilation system** has been designed to ensure the maintenance of an adequate and constant microclimate inside the cowshed by controlling circulation, temperature, air humidity and gas concentrations produced by the litter box.

Insulated panels were used for the walls.

Moreover we are going to design an **extensive green roof** for this innovative cowshed .



# The green roof: main features



We have chosen an extensive green roof with the following characteristics:

- Biodiversity of plants because it's possible to use many varieties
- Thin organic soil because it improves the development and growth of plants

n. 5 – The green roof





# ESTIMATIVE METRIC COMPUTATION

MATERIALS	UNIT PRICE	QUANTITY	TOTAL
EXSTENSIVE GREEN ROOF	131,34€/m <sup>2</sup>	370 m <sup>2</sup>	48.595,80€
CONCRETE	130,00€/m <sup>3</sup>	67,6m <sup>3</sup>	8.788,00€
POLE IN IRON	30,00€/m	240m	7.200€
INSULATING PANEL	35,00€/m <sup>2</sup>	490m <sup>2</sup>	17.150,00€
AUTOCATTURE	800,00€ a box	8	6.400,00€
ZINC TUBE	5,00€/m	510m	2550,00€
PERPENDICULAR JOINT	3,50€ a piece	125	437,50€
DRINKING TROUGH	30,00€ a piece	8	240,00€
WINDOW	105,00€ a piece	4	420,00€
<b>TOTAL</b>			<b>91.781,30€</b>





n. 6 - Some of the materials that are used for the construction of the cowshed

# Conclusion

- The result is a cowshed model for the breeding of beef cattle in which have been applied the criterion of design, directed at the welfare and health of the animal, the simplification of management activities (cleaning and distribution of food) and at the bottom environmental impact.
- The cost is: **91.781,30€**



# Bibliografhy

- [worldarchitecture.org/architectureprojects/gcnh/modern\\_cattle\\_sheds\\_punjab-project-pages.html](http://worldarchitecture.org/architectureprojects/gcnh/modern_cattle_sheds_punjab-project-pages.html)
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Thanks for your attention

