

# Turning liability to livelihood: Stray cattle-based integrated farming model

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*The increasing number of stray cattle roaming around on the streets poses a serious challenge to villages and towns, affecting transport, farming, and public health concerns. Keeping this in mind, Krishi Vigyan Kendra, Begusarai, Bihar pioneered an innovative pilot integrated model that combines stray cattle management with backyard poultry, goatery, vermicomposting, and moringa cultivation. Under this, 16 unproductive cattle were adopted from nearby villages, along with on-farm rearing of 200 Kadaknath birds and 11 goats. Dung and urine produced by cattle have been used for vermicomposting and the preparation of natural farming inputs. Although bearing with the initial loss, the model became profitable in the second year due to resource optimisation and integrated farm outputs. This model demonstrates the financial viability and ecological benefits of managing stray cattle through sustainable farming integration.*

**Keywords:** Backyard poultry, Goat, Sustainable farming integration, Vermicomposting

INDIA has the world's largest cattle population (193.5 million) in the world (FAOSTAT 2021-22). However, the problem of stray cattle is one of the most under-addressed issues in India. A large number of unproductive animals are being abandoned, escalating concern from rural to urban areas. Generally, perceived as 'useless' due to unproductive, diseased or reduced draught purpose use, these animals are left abandoned to roam freely, damaging crops, and creating public nuisances on roads. At the same time, a significant portion of India's farming population comprising around 67% of this rural population owns livestock as a part of a mixed farming system. Integrating livestock, including stray cattle into diversified farming systems may offer them a sustainable livelihood option while addressing environmental and societal concerns.

## Rationale of the model

When the indigenous cattle owned by the farmers are not capable of producing milk or are beneficial for draught purposes, it challenges their economic value to the farmer, forcing them to abandon their animal. However, previous research shows that these animals are still capable of producing milk or progeny which farmers otherwise are not able to maintain due to financial constraints involved in their treatment and management. Along with this, the animals with less production or no production may also be utilised for their dung and urine for various purposes, such as biogas plants, vermicompost, organic fertilisers, biofertilisers, and cow dung-based eco-friendly products. Subsequently, the vermicompost and biofertilisers can potentially be used as organic manure to address the soil health challenge. Promoting the use of cow dung manure will go a long way toward improving the economy of

the country, supporting organic and natural farming, and improving the sustainability of agriculture.

Realising the potential of these animals, this model was conceptualised to develop a sustainable model through the economic utilisation of stray cattle by integrating them with other farm components. The model also addresses soil enrichment using cow dung and urine, supporting natural farming. Thus, this is a holistic model integrating vermicomposting,



Stray cattle unit

**Table 1.** Economic analysis for the first year of the stray cattle-based integrated farming model

| Description                                     | Input cost (₹)      | Income source                                                                              | Revenue (₹)        |
|-------------------------------------------------|---------------------|--------------------------------------------------------------------------------------------|--------------------|
| Cost of stray cattle rearing (16)               | 4,76,240.00         | Milk (4,599.3 kg @ ₹45/kg), vermicompost (11020.8 kg @ ₹6/kg), and urine (4,592 L @ ₹1/L), | 2,77,685.30        |
| Cost of poultry (200)                           | 1,98,780.00         | Eggs, chicks and poultry excreta                                                           | 4,66,000.00        |
| Cost of goat rearing (59)                       | 1,15,572.00         | Sale of the goat and manure                                                                | 2,50,500.00        |
| Labour wage (2) + purchasing of farm equipments | 2,09,700.00         | –                                                                                          | –                  |
| <b>Total</b>                                    | <b>10,00,292.00</b> |                                                                                            | <b>9,94,185.30</b> |

\*House construction cost is included in the capital cost as it was funded by Rashtriya Krishi Vikas Yojana.

backyard poultry, goatery, and moringa cultivation, aimed at turning perceived liabilities into sustainable income-generating livelihood opportunities.

#### Management of stray cows in integration with different components

**Stray cattle unit:** Twelve unproductive stray cattle (age >5 years), including their calves (4 Nos.) were adopted under this project by Krishi Vigyan Kendra (KVK), Begusarai. A cattle shelter has been made in the premises of the KVK where dung and urine of these cattle are collected for better utilisation. Concentrate and roughages are provided at 40:60 ratio for these cattle. The cattle were fed with moringa incorporated concentrate mixture, wheat straw, and hybrid napier green fodder feed as per nutritional requirements to fulfil their physiological and metabolic needs with concentrate, straw, and green fodder at 3–4, 4–5, and 25–30 kg/day, respectively, on a fresh basis. Azolla is also used for feeding as a protein supplement.

As a result of improved managerial practices, including reproductive treatment, the body condition and health of cows were improved. After five months, nine healthy cows became cyclic and were chosen for artificial insemination. Out of nine cyclic cows, five conceived successfully through artificial insemination and started producing milk after calving. Milk produced by these cows is sold

to local consumers. Dung and urine produced by cattle are used for the production of vermicompost and different inputs for natural farming like *beejamrit*, *ghanjeevamrit*, *jeevamrit*, *panchparni*, etc. Vermicompost is utilised on the KVK farm as well as sold to the farmers.

**Backyard poultry unit:** A total of 200 Kadaknath birds have been reared for egg production with the integration of stray cattle. To reduce the feed cost of these birds, azolla and maggots are used for feeding them. A hatchery unit with a capacity of 412 eggs is also established at the KVK premises for chick production. The chicks,

manure and eggs produced from backyard poultry units are sold to local farmers and consumers.

**Goatery unit:** The goatery unit was also started with ten multiparous advanced pregnant females and one buck and later expanded to 68 animals. The waste feed of stray cattle, grasses, azolla, and moringa is used for feeding these goats to reduce the feeding cost. The kids and manure produced by this unit are sold to local farmers and consumers.

#### Economics

The poultry, goatery, and vermicompost units generate more revenue than their expenditures. The total economics of this integration model have been calculated for the first and second years and are given in Tables 1 and 2, respectively.

#### Output and impact

The impact of this model was invisible in economic, social and ecological terms. In the first year of the model project, a nominal loss of ₹6,106.70 was observed due to the inclusion of capital costs (except house construction). However, in the second year of the project, a profit of ₹94,015.00 was earned due to integration with backyard



Poultry unit



Incubation of eggs



Goat rearing



Vermicompost unit

**Table 2.** Economic analysis for the second year of the stray cattle-based integrated farming model

| Description                              | Input cost (₹) | Income source                                                                          | Revenue (₹)  |
|------------------------------------------|----------------|----------------------------------------------------------------------------------------|--------------|
| Cost of stray cattle rearing (18)        | 5,81,400.00    | Milk (4,380 kg @ ₹45/kg), vermicompost (19,710 kg @ ₹7/kg), and urine (22995 L @ ₹1/L) | 3,58,065.00  |
| Cost of poultry and chicks feeding (200) | 4,67,080.00    | Eggs, chicks and poultry excreta                                                       | 6,39,000.00  |
| Cost of goat rearing (68)                | 73,770.00      | Sale of the goat and manure                                                            | 3,68,000.00  |
| Labour wage (2)                          | 1,48,800.00    | –                                                                                      | –            |
| Total                                    | 12,71,050.00   |                                                                                        | 13,65,065.00 |

poultry, goatery, and vermicompost units. Therefore, this model became financially sustainable in the second year, from a loss to a profit within one year and started generating consistent revenue. Similarly, it is also generating regular employment for two persons around the year, along with a sustainable demonstration unit for KVK. The KVK serves as a focal point for

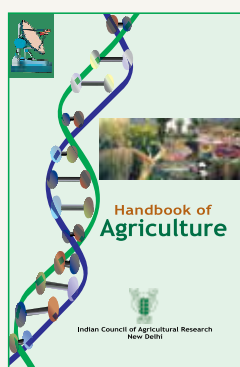
visiting farmers and trainees for this model demonstration, creating an indirect social impact on other farmers. Concerning agro-ecological impact, the use of organic and natural farming practices improved the soil fertility by using dung-based inputs as well as efficient recycling of farm residues and feed resources, leading to a better ecosystem.

## SUMMARY

This model demonstrates that stray cattle, when integrated with a diversified farming component, are not liabilities but become a source of livelihood. Through careful planning, local resource utilisation, and integration with need-based units like poultry, goatery, and composting units, even non-milking cattle can generate revenue, support livelihoods, and promote agroecological sustainability. This model is scalable and replicable, especially in rural and peri-urban areas facing stray cattle issues, provided with appropriate technical and policy support as a viable enterprise across the country.

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