

## Analysis: How Circularity Powers Sustainability

Extensive (Grazing) Systems (Circular system of production)	Intensive (Sedentary) Systems (Linear system of production)
Optimizes use of biomass / vegetation on Common Property Resources (CPRs), in forests, on crop fields & uses minimal agricultural land for fodder cultivation.  Therefore, the system is low input and low carbon & water footprints.	Major dependence on markets for specialized feeds, concentrates, protein rich diets & uses large tracts of land for cultivation of protein rich fodder crops.  Therefore, high dependence on markets, high inputs systems, high water and carbon footprints.
Low risk system - as animals walk to the feed resources and can cope with fluctuation in feed availability. Since there are multiple species within these systems it enables diversified products.	High risk system - Intensive livestock systems rely on transporting feed from distant locations, creating an increased dependence on markets and are hence vulnerable to feed availability fluctuations.  As the focus is on one species, the output is limited to one or two products.
High social integration with other communities where exchange of services and commodities occurs - this interconnectedness reduces input costs, helps in managing risks, and enhances the system's resilience to external shocks.	No social integration with other communities where exchange of services and commodities occurs - this isolation increases input costs, elevates risk, and reduces the system's resilience to external shocks.
Low to nil environmental impact.	High environmental impact.
Extensive Systems are reliant on animal and herd intelligence and the role of the animals goes beyond food production.	Animals are just feed converters and limited to food production.

## Conclusion

Livestock production in India which is predominantly extensive in nature, is often misunderstood and branded as a low-output, inefficient, and high methane emitting system.

Extensive systems exhibit inherent circularity where livestock grazing provides several services to keep ecosystems and agriculture resilient. What goes unnoticed is that livestock in extensive systems are intrinsically linked to land use land cover where a mosaic of land resources contribute to 60% of the feed requirements of India's livestock, unlike in the West.

Extensive livestock production uses very little land, water, and energy resources for feed cultivation and livestock production - making them ideal for small and marginal farmers, a majority in India.

Hence, promoting systems with inherent circularity is also a pathway to sustainable food production.



# Understanding Circularity in Livestock Production Systems

## Extensive Livestock Systems vs. Intensive Livestock Systems



To connect, please write to:  
[rlnsecretariat@gmail.com](mailto:rlnsecretariat@gmail.com)



## Introduction

Rapid transitions to more specialized and intensive systems are taking place across India concerning livestock production.

Led by the thought that food needs to be available for all at a more affordable rate.

However, this approach has inadvertently led to several issues, both social and environmental - but most importantly: decreased the circularity in food production in Indian livestock production systems.

## Intensive Livestock Systems



Intensive & Specialized Livestock systems, despite high level of food production, involve high risks as they are less diversified, have high costs of production, depend extensively on markets for inputs, and are subjected to high market price fluctuations.



As they are specialized system - they produce only 1 or 2 products; and thereby are susceptible to high risk and do not ensure food and nutrition security unless the income is secured.



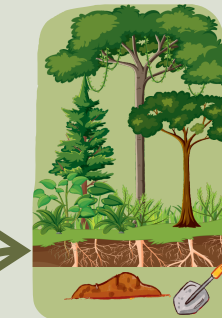
Intensive & Specialized Livestock Systems are heavily depended on markets as they are a high input - high output systems.

They consume high levels of water and energy resources for production & have high carbon and water foot-prints - and often leading to environmental and social impacts over time.

Intensive & Specialized Livestock Systems need dedicated land, water and energy resources to meet feed & water and continue production.

## Extensive Livestock Systems

Healthy ecosystem and livestock manure enhances soil fertility, keeps soil carbon level high and helps in maintains agricultural productivity.



Livestock grazing provides several services to ecosystems to keep them resilient and productive - nutrient cycling, germination etc.



Reduces risks, inputs costs, dependence on markets.



More integration between crop & livestock farmers for exchange of services.



Extensive systems use a mosaic of land resources to meet feed & water requirements. They are hence low input systems and have low carbon foot - print. They are often diversified livestock systems that provide multiple products, income streams and services to communities; and thereby reduce risk and ensure food and nutritional security.

