Recycling food waste for animal feed in South Asia: A systematic review of circular practices

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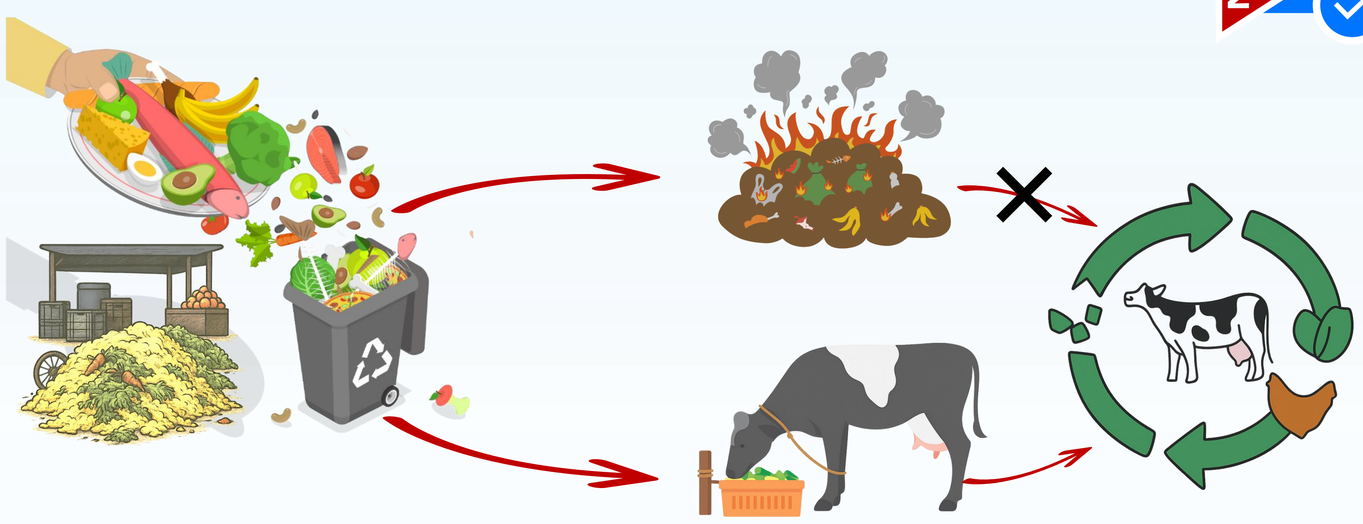
Background

- Abundant food waste in South Asian Countries (SACs)
- Inept waste management worsens pollution
- Food waste emerging as alternative animal feed
- Upcycling recovers nutrients and reduces waste
- Waste as feed supports circular economy



Methodology

Systematic review
Define research scope
Tools: Web of science, Google Scholar, others

Screening
PRISMA
Papers: 512
Selected: 24

Data extraction
Waste generation, managing, reuse, nutrition, policy

Synthesis
Word cloud
Thematic coding
MAXQDA

Aim: Asses the potential of food waste as feed by examining waste generation patterns, identifying barriers to its mainstreaming, and examining existing waste governance and management frameworks with circularity principles.

Results

From 312 coded texts, food waste studies focused mainly on management systems (24.7%), source separation (12.8%), waste types (11.2%), nutritional attributes (9.6%), recycling (9%), and socio-cultural perceptions (9%) (Fig. 1). Most countries still dispose of waste by dumping or burning, while only a few utilize food waste as feed (Fig. 2).

Fig. 1 Word cloud of keywords associated to food waste.

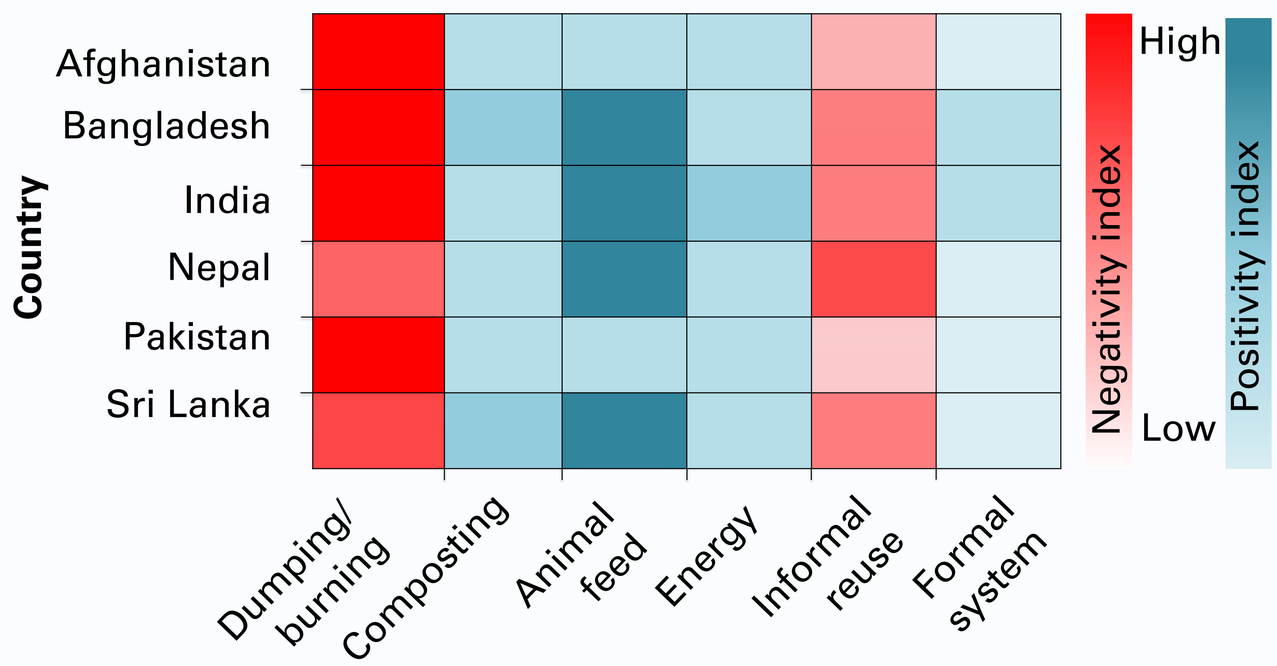


Fig. 2 Treatment practices of food waste across South Asian countries.

Reviewed papers underlined food waste factors: family size, quality decline, and ignorance (17%); sources such as homes, restaurants, and swill feed (38%); nutrient loss (38%); and safety risks from microbes, toxins, and pollution (33%). Source separation (washing, re-cooking, ensiling, processing) was reported in 50% of studies.

Food waste as animal feed

Benefits **vs** Challenges

Benefits	Challenges
Reduced food loss	Microbial hazard
Feed cost reduction	Toxicological risks
Improved livelihood	Physical hazards
Environment	Nutritional imbalance

Highlights

Research gaps

- Lack of nutritional data
- No standards regulations
- Limited scientific evidence
- Lack of coordinated policies

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