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Climate smart livestock management and feeding options for small-scale farmers: A review

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Introduction

- The production of greenhouse gasses (GHGs) particularly carbon dioxide (CO_2), methane (CH_4) and nitrous oxide (N_2O) is considered as an important cause of climate change.
- Defined as the change that can be attributed directly or indirectly to human activity that alters the composition of the global atmosphere and which is in addition to natural climate variability observed over comparable time periods.
- Agriculture is not only affected by climate change but also contributes to it in different ways.

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Introduction cont.

- The livestock sector is one of the large contributors of anthropogenic GHG emissions.
- Contribution of livestock production system to global climate change is classified to three main sources.
- These sources are, the enteric fermentation of the animals, manure (waste products) and production of feed and forage (field use).

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Introduction cont.

- In Africa, the agricultural sector constitutes the largest sector of the domestic economy, with livestock, forming an essential component of agriculture.
- Small scale mixed crop-livestock is one of the common agricultural practices.
- Livestock system is composed of cattle, goat and sheep.

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Introduction cont.

- These livestock require good quality pastures to maintain satisfactory animal performance throughout the year.
- Achieving and maintaining the satisfactory animal performance is a major challenge in the wake of climate change.
- Small scale farmers are considered to be the worst affected by changes in climate since they rely heavily on the natural resource base for their livelihoods.

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Introduction cont.

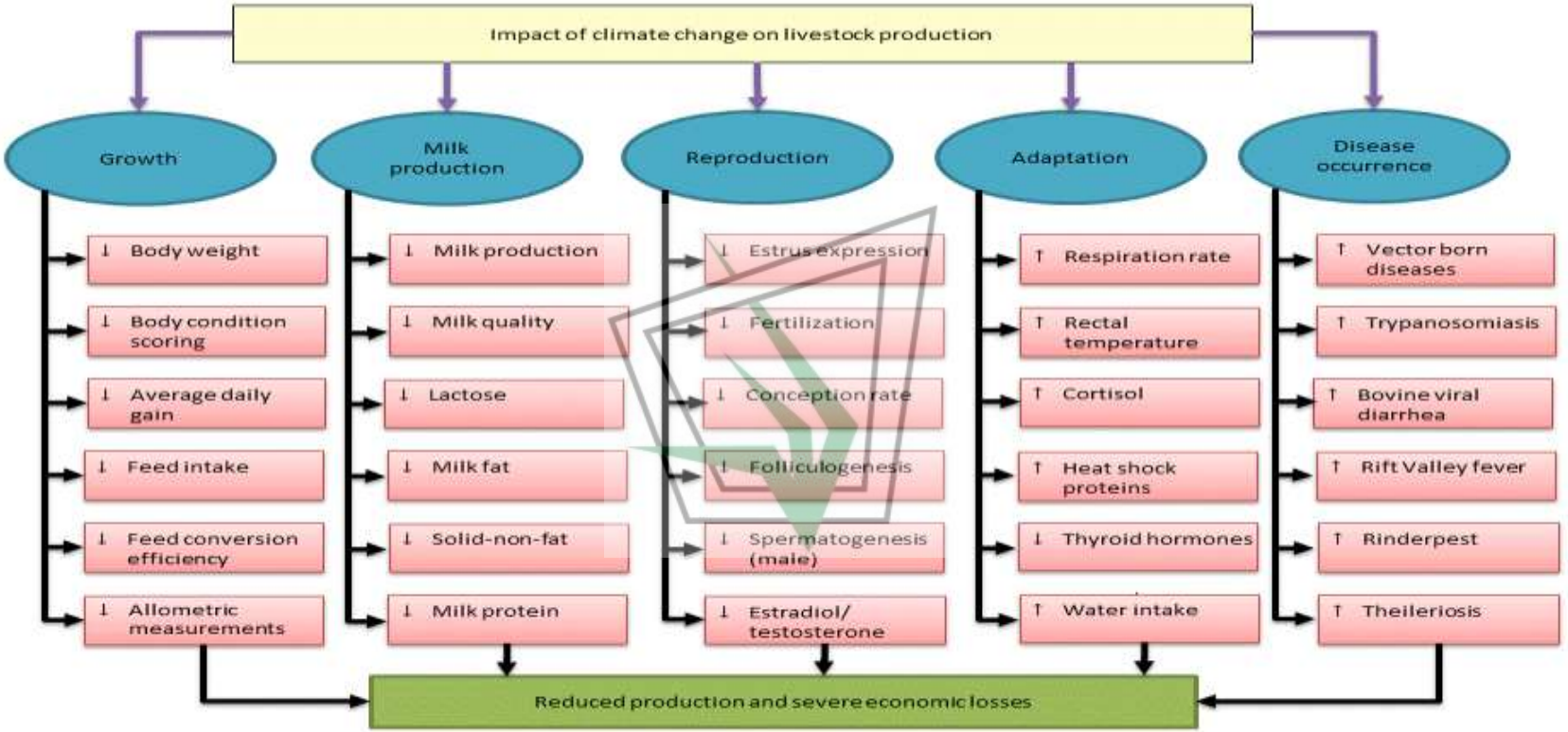

Fig. 1. Impact of climate change on livestock production

Source: Broadening Horizons (Feedipedia).

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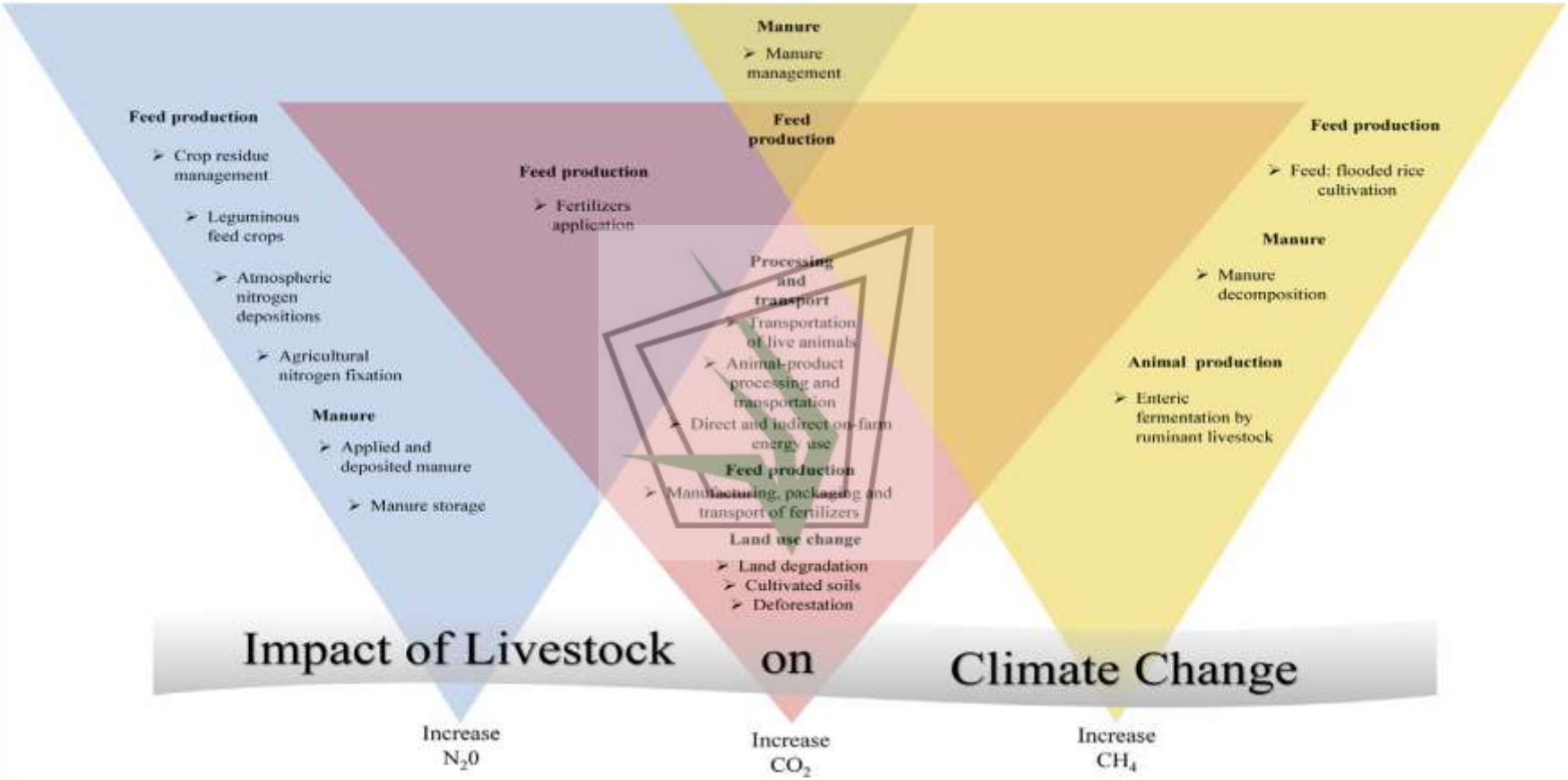
Introduction cont.



Source: Climate Risk Management 16 (2017):145–163.

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SO WHAT ?

- There is a need to explore alternative options for the small scale farmers.
  - One such intervention is climate smart agriculture (CSA), which is one of the most viable and sustainable options.
- Climate smart agriculture offers both mitigation and adaptation measures to climate change.

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SO WHAT ?

- The adoption of CSA as an adaptation strategy is envisaged to assist small scale farmers adapt to climate change by intensifying or diversifying their livelihood strategy.
- This review explores climate smart livestock production techniques which can reduce GHG emissions from livestock production systems and simultaneously improve livestock production.

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Climate smart feed prod. options.

- **Grass-legume intercropping**

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Climate smart feed prod. options

- **Integration of forage legumes into arable crops**

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Climate smart feed prod. options .

- **Fodder cultivation and conservation**

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Livestock production mngmt. options

Herd management

- Switch to keeping breeds, which cope better with tougher climatic conditions.
- Small ruminants - are less vulnerable to warming (requiring less water and food.
- Diversify livestock species.

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Livestock production mngmt. options

Breeding strategies

- Promoting and strengthening the use of local breeds that are adapted to local climatic stress and feed sources or,
- Improving local genetics through cross-breeding with heat and disease-tolerant breeds.

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Discussion and Conclusions

- CSA practices should be adopted and up-scaled as an adaptation strategy that can assist small scale farmers to counter the effects of climate change.
- The promotion and use of CSA to adapt to climate change presents an opportunity to intensify and diversify the livelihood strategy of small scale farmers.
- Climate smart agriculture is one of the most viable, environmentally friendly and sustainable production options.

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Discussion and Conclusions cont.

- Climate smart agriculture offers both mitigation and adaptation measures to climate change.
- Adoption and use of climate smart agriculture can be used as a tool to restore and conserve the natural resource.

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