



## REVIEW ARTICLE

## A REVIEW ON PASTURE UTILIATION AND MANAGEMENT

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## ABSTRACT

Pasture, comprising mainly grasses with interspersed legumes and forbs, serves as a vital resource for cattle nutrition. However, improper management practices, such as overgrazing and traditional methods like burning, have led to the degradation of pasturelands in Nepal. This article delves into the challenges faced in pasture utilization and management in Nepal, examining factors affecting utilization, grazing management strategies, and the socio-economic and environmental implications. By analyzing existing literature and studies, the article aims to highlight the need for sustainable pasture management practices to enhance livestock productivity, preserve biodiversity, and support rural livelihoods. Moreover, it explores the significance of factors like rotational grazing systems, weed control, fertilization, and stocking rates in improving pasture quality and utilization efficiency. Ultimately, the study emphasizes the interdependence of pasture utilization and management, address the challenges faced in Nepal's pastoral ecosystems.

## KEYWORDS

Pasture utilization, pasture management, grazing management, livestock productivity, sustainability, Nepal.

### 1. INTRODUCTION

Pasture consists mainly of grasses, with an interspersion of legumes and other forbs (non-grass herbaceous plants). Some of the pasture species suitable for livestock are Ryegrass, Lucerne, kikuyu, Para grass, Guinea grass, Napier grass, joint vetch, stylos etc. Pasture can result in cost effectiveness which requires best management of both forage and livestock. Pasture utilization is a measure of the difference between the amount of pasture dry matter grown versus the amount of pasture dry matter consumed. Pasture utilization is expressed as a percentage (%). Pasture management is the process of managing the system to achieve specific goals, such as improved pasture condition, higher forage yields, and animal production with ecological consideration, by combining animal, plant, soil, and other environmental components with grazing strategies (Sevov et al., 2018).

The status of pasture utilization and management in Nepal shows overgrazing, degradation, and encroachment of forested areas. According to the Ministry of Agriculture and Livestock Development, the total area of pastureland in Nepal is around 8.8 million hectares, of which only 44 percent is considered suitable for grazing. This limited grazing land is further degraded due to overgrazing, which has led to soil erosion, reduced soil fertility, and loss of biodiversity. A study conducted by a group researchers in the hills of Nepal found that the average carrying capacity of pastureland in the study area was 1.35 livestock units per hectare, which is higher than the recommended carrying capacity of 1.0 livestock unit per hectare (Adhikari et al., 2019). The study also found that most farmers practiced open grazing, which has led to soil erosion, loss of soil fertility, and reduced biodiversity. Traditional pasture management practices in Nepal have also contributed to the degradation of pastureland. Dahal and Subedi found that traditional pasture management practices, such as burning and grazing during the dry season, have led to the degradation of pastureland and loss of biodiversity (Dahal and Subedi, 2018).

### 2. JUSTIFICATION OF STUDY

The livestock sector is a crucial component of Nepal's economy, providing livelihood opportunities to millions of people (Bhattarai and Shrestha, 2018). Overgrazing, poor grazing practices, and encroachment of forested areas have led to the degradation of pastureland, reducing its carrying capacity and affecting the livelihoods of millions of people dependent on livestock rearing (Ministry of Agriculture and Livestock Development, 2019). Inefficient pasture management practices have resulted in adverse environmental impacts, including soil erosion, loss of biodiversity, and reduced carbon sequestration (Bhattarai and Shrestha, 2018). Understanding the socio-economic and environmental implications of pasture management practices can help policymakers and stakeholders to design and implement effective strategies to improve pasture management, livestock productivity, and rural livelihoods (Adhikari et al., 2019). The study of pasture utilization and management in Nepal can help identify the existing challenges, opportunities, and best practices for sustainable livestock production and environmental conservation (Central Bureau of Statistics, 2021).

#### 2.1 Objective

- To know about the relationship between pasture utilization and pasture management and its concern to animals.
- To understand the factors affecting pasture utilization.
- To be aware of the problems that may occur due to inappropriate pasture management.
- To realize the impact of pasture utilization on nutritive gain of animals.
- To find out the appropriate systems for better pasture utilization and management.

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### 3. PASTURE UTILIZATION

Pasture utilization depends on the balance between removal by animals & pasture decay and pasture production. The amount of pasture utilized depends on livestock type and number, timing of lambing/calving, stocking rate etc. The goal of optimal pasture usage is to leave pasture residue in the best possible condition for quick regrowth while converting the most amount of pasture energy and nutrients into marketable goods (meat). High levels of utilization will maximize animal production per hectare, but if utilization is too high and ground cover declines too far, soil health will be damaged and nutrient recycling will be compromised. Increasing utilization can also improve pasture growth and quality, leading to better feed conversion efficiency, increased beef production per unit area and a decrease in unit cost (Byrne, 2021).

### 4. FACTOR THAT AFFECTS PASTURE UTILIZATION

- Because mature tall grass is difficult for animals to bite off and digest, it will not be exploited to its full potential. When forage is too short (less than 5–7 cm), the animal cannot receive a large bite and must wander farther to obtain sufficient feed.
- Feces or urine-contaminated fodder won't be consumed.
- Less likely to be consumed is forage that has been trampled or lay upon.
- The more appetizing plants will be consumed and the less appetizing ones will be left behind if there is a large variety of plants to graze on. After that, these plants have an opportunity to keep growing and eventually take over the grassland.

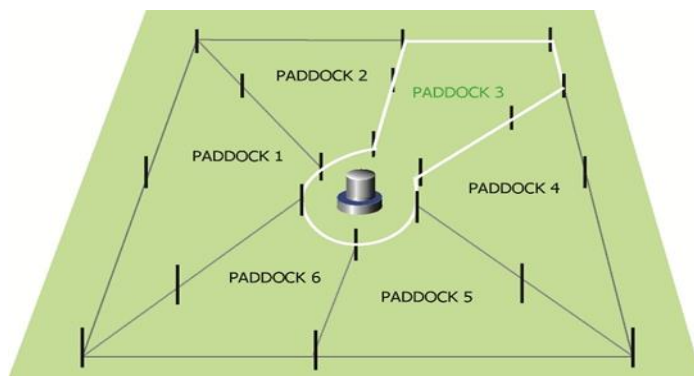
### 5. WAY TO INFLUENCE PASTURE UTILIZATION

- Reduce the area and quantity of grass that is accessible at any given moment; this allows the animal to have access to a larger percentage of fresh grass.
- Smaller paddocks promote resting and grazing while reducing walking and tramping.
- Consider harrowing to spread out large manure patties that are not breaking down and hasten their breakdown if there is a lot of them.
- Provide water in the paddock to reduce the amount of time spent away from the grass you want them to consume. When cattle graze on grass that is optimal for their performance, their dung will be loose and not in dried patties.
- Clipping mature plants, including weeds, can enhance use.
- When cattle graze on a "new" or "fresh" paddock, they concentrate on eating, fill up more quickly, and relax more during the day rather than scavenging for more tasty grass to nibble on.
- Consuming high-quality forage is preferable to low-quality because of the slower digestion caused by greater ADF, which lowers consumption.

### 6. PASTURE MANAGEMENT

- To lower the risk of pathogen infestation, deterioration of the grass cover, and soil erosion, pasture management should be done properly.
- A well-run pasture management program can result in a more varied, dense, and long-lasting pasture as well as increased soil fertility and grazing season length (Lemus, 2015).
- To maintain pastures in good condition, use the proper stocking density to prevent overgrazing and undergrazing while keeping an eye on the pastures to determine the ideal recovery period between animal use (Grazing and pasture management for cattle, 2021).

### 7. WAYS FOR GOOD MANAGEMENT OF PASTURES



#### 7.1 Appropriate Grazing System

Rotational grazing techniques enable grasses to replenish the energy stores needed for growth, they increase pasture productivity. At least once every cycle, which lasts two to three months, pasture should be rotated. The animal should be entered into the pasture when pasture attains 7 to 10 inches height and only let them graze up to 3 to 4 inches.

#### 7.2 Mowing

If most of the grass species in the pasture are short, fine-bladed species like bluegrass and perennial ryegrass, then when you mow, keep the forage height between two and three inches and mow to keep the height of 3 to 5 inches for taller, higher-yielding plants like timothy or orchard grass. The mowing advantage is reducing weed establishment, improving roots growth and preventing disease and insect.

#### 7.3 Reduce Weed Pressure.

Weeds compete with forages for space, nutrients, light, and water which result in the failure of pastureland. Curly dock is an example of a perennial weed that chokes out grasses and degrades pastures' forage quality. So, it is most important to reduce the weed pressure in the pasture.

#### 7.4 Fertilization and Liming

Pasture development totally depends on the nutrient for forage growth and quality. Nitrogen governs the dark green color and vigorous growth whereas phosphorus improves forage quality and root development. The ability of the plant to increase the absorption of the nutrients and water from soil completely depends upon a well-developed root system. Potassium increases a plant's resilience to stressful situations, such as drought or bitterly cold winter weather. A lack of potassium is shown in stunted development, decreased resilience to illness, and decreased hardiness against cold. Add the lime at least half a year before sowing.

#### 7.5 Stocking Rate

Increasing stocking rates increases pasture utilization, and the amount of pasture consumed/amount of pasture offered, often referred to as grazing efficiency. Proper stocking rates also increase overall sward quality by encouraging uniform defoliation closer to the plant growing points resulting in the promotion of new tillers. The short, uniform defoliation promotes new growth, which increases the total production of herbage per area (Baker and Leaver, 1986).

### 8. CONCLUSION

Pasture utilization and Pasture management go hand in hand so these two must be synchronized with each other. Establishment of confinement areas during dry month, adoption of appropriate grazing systems, fertilization of pastures, lengthening the duration of grazing period, inclusion of legumes are some of the improvements that can lead to substantial increases in productivity per acre, with-out the need to resort to expensive and novel aids. The aim of grazing management should be to maximize pasture energy and nutrient conversion into marketable products while maintaining the greatest possible condition for pasture residue to regenerate quickly. Up to 60% of the green pasture grown in an area can be utilized with careful management of the pressure exerted by grazing and the structure of the herd throughout the entire grazed area. Adopting a grazing management strategy based on anticipated seasonal plant growth patterns increase pasture utilization.

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