Definition:

$$\frac{Aboveground\ Biomass}{Nitrogen\ fertilizer}$$

Description:

Benefit: This impact area refers to the total weight of all aboveground, harvestable parts of cultivated plants. It is suitable, where production is to be used for energy and other non-food purposes that can utilize the whole plant. Woody crops and forage crops will show high efficiencies in this impact area.

Resource: Nitrogen fertilizer is considered a stressed resource for several reasons. While the supply of nitrogen is effectively unlimited, its production is highly energy intensive and its application results in emissions of ammonium and nitrous oxide, creating a conflict between nitrogen fertilizer application and climate change mitigation targets.
Depending on the application rate and type of nitrogen fertilizer (in combination with site specific conditions), diffuse pollution and contamination of water resources is also relevant. Diffuse nitrogen pollution may also strongly affect nutrient poor natural ecosystems and alter species composition.
Finally, fertilizer application is a relevant factor in farmers‘ cost calculations.

Correlation with soil management:

[260] Inoculation of rice with dark septate endophytic (DSE) fungi represents a strategy to improve green manure-N recovery, grain yield per plant, and grain quality in terms of micronutrients contents in cropping systems with a low N input

Strength & weaknesses pertaining to measurement of this impact area:

Biomass: Total amount aboveground biomass (production is generally easy to measure.
However, the informative value is limited where they do not account for qualitative differences between types of biomass and are not accompanied by information on site conditions such as local climate or soil fertility. Therefore, comparisons between efficiencies of different production processes with regard to yields should only be made where products and site conditions are similar. In some cases, it may be advisable to select alternative indicators where the type of benefit is more clearly defined (e.g., energetic value, financial benefit).

Can be measured as:

Aboveground Biomass:

- yield, fresh weight [t]
- yield, dry matter weight [t]

Nitrogen fertilizer:

- total nitrogen fertilizer application [kg N]

Sample Indicators

Indicator values from		Survey	
Experiment or direct measurement		Statistical- or census data	
Expert assessment		Literature values	
Model		Maps or GIS	
Stakeholder participation		Not provided	

Table 1: Field Scale

Indicator	**Unit**	**Indicator values from**
[260] Nutrient concentration (%) (Dry matter/N content)	mg plant^{-1} * (mg plant^{-1}) $^{-1}$	

References

ID	**Citation**	**[1]Soil type & texture**
260	Vergara, C., et al. (2018). "Dark Septate Endophytic Fungi Increase Green Manure-N-15 Recovery Efficiency, N Contents, and Micronutrients in Rice Grains." Frontiers in Plant Science **9**.	Haplic Planosol; Sandy soil (3% clay, 5% silt, and 92% sandy)

[1]**Soil type & texture:** If provided, what are type and texture of the soils studied in the paper?