



# Biochar: Nutrient Enrichment and Release

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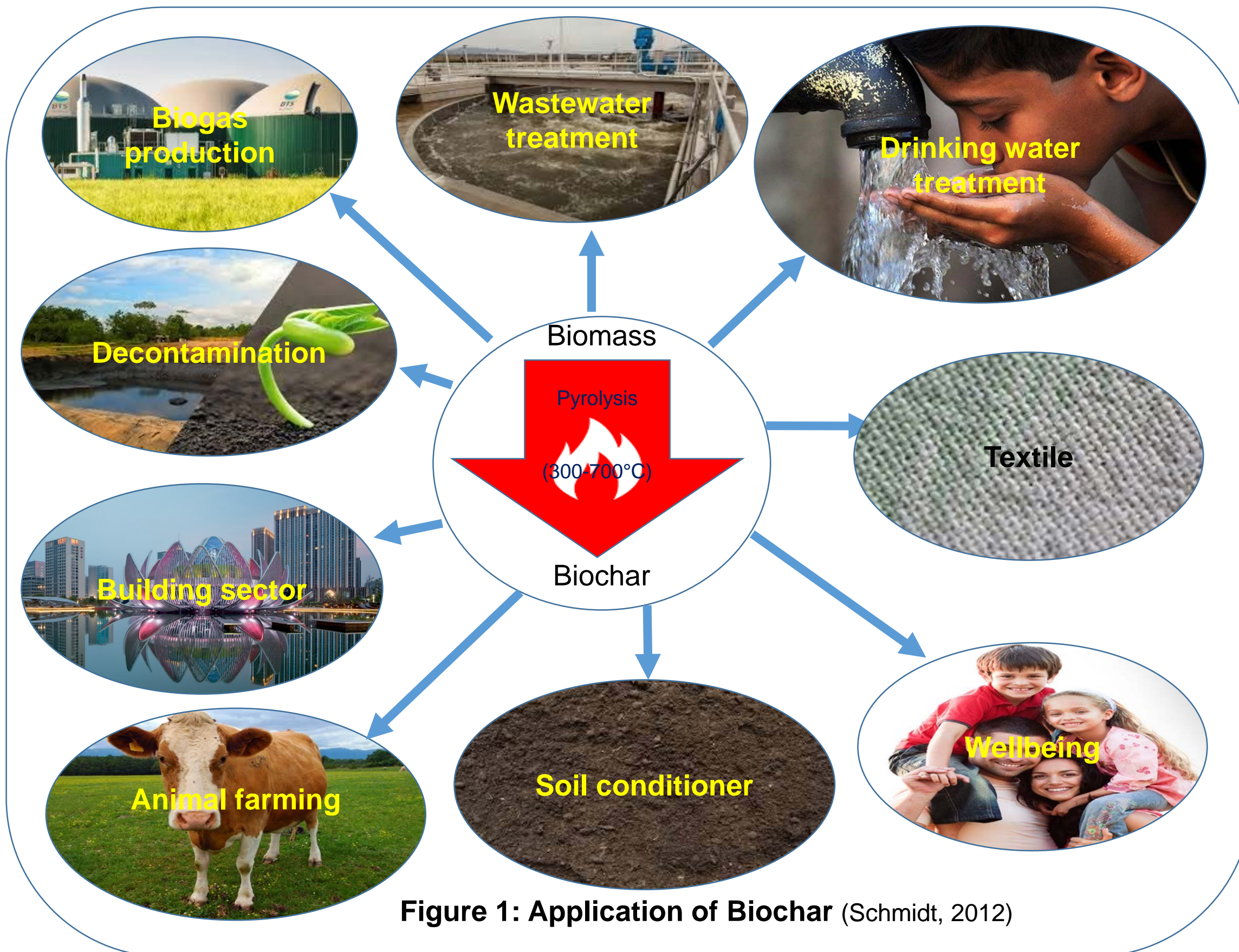
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## What is Biochar?

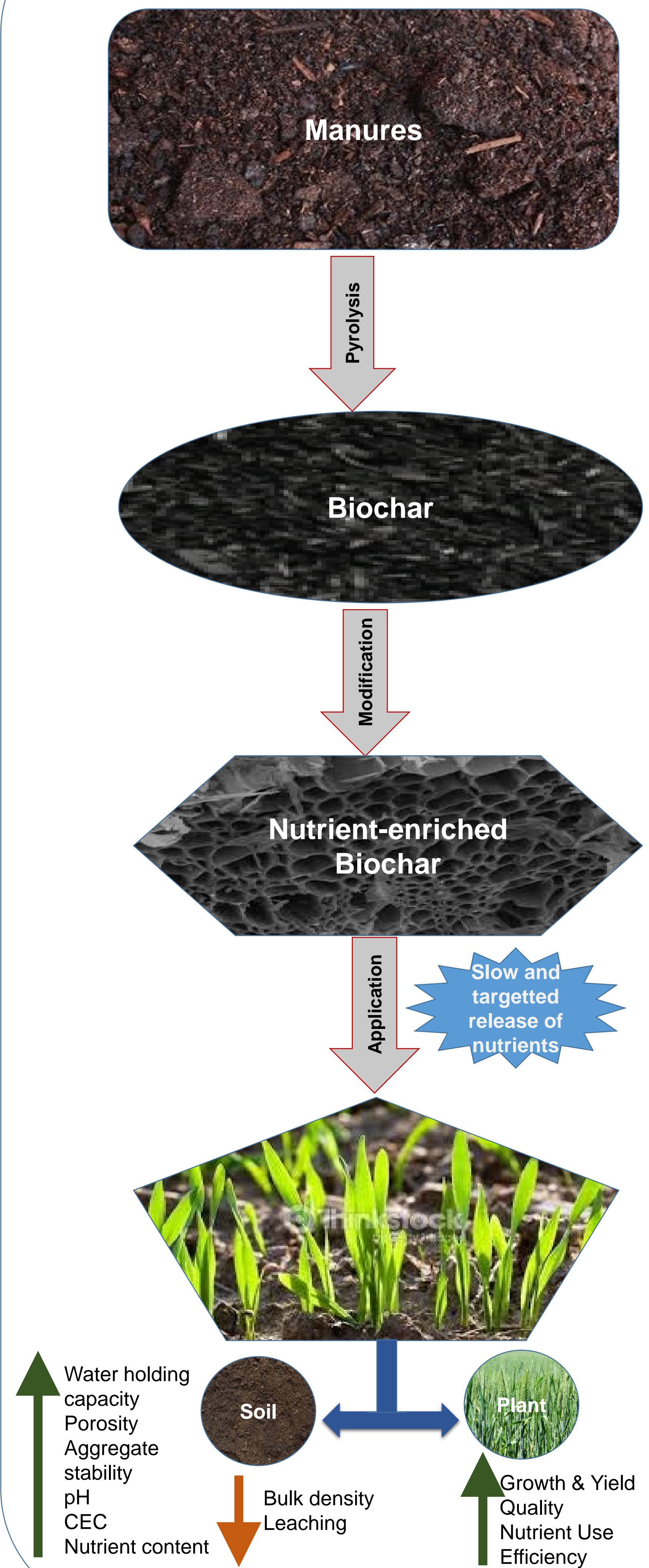
- ❖ Biochar is a carbon-rich by-product of the thermal conversion of organic feedstock and is primarily used as a soil amendment (Igalavithana et al., 2018).
- ❖ The characteristics of biochar are influenced by the feedstock and pyrolysing conditions.
- ❖ Biochar is a stable grained material which contains different types of pores.
- ❖ Biochar contains ash, C, H, S, P, O, N and various mineral components, functional groups etc.
- ❖ It also contains different minerals like sylvite, quartz, amorphous silica, calcite, hydroxyapatite, and mineral phases.
- ❖ In addition, significant amount of trace elements such as, Fe, Cu, B, Zn, Mn and Mo etc. are also present in biochar.



## Biochar and Soil Health

- ❖ Biochar improves soil health by increasing soil fertility, pH in acidic soils, soil CEC and soil microbial activity and nutrient retention.
- ❖ Biochar amendments and crop rotation minimise the adverse effect of long-term biomass harvesting on soil quality.
- ❖ Biochar application has a positive impact of available nutrient contents and bacterial population in the soil.
- ❖ To sustain soil health it requires to modify the biochar
- ❖ Biochar is modified by altering porosity, surface characteristics and alter the functional groups.
- ❖ A number of technologies have been developed to modify biochar:
  - surface oxidation and impregnation of minerals,
  - high temperature ammonification,
  - pelleting and organo-mineral complex,
  - thermal plasma process, grafting and soaking.
- ❖ Moreover, nutrient enrichment can be done by producing biochar from manure, sewage sludge and compost etc.
- ❖ Modified biochar can be used as effective slow-release fertiliser (Wen et al. 2017).

## Biochar enrichment and potential outcome



## My research will focus on the

Characterisation of biochar produced from manures, as well enriching biochar with inorganic nutrients to optimise the nutrient release efficiency

### References

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### Acknowledgement

I would like to thank to the University of Newcastle for providing scholarship to pursue my PhD degree.