An emission factors-based tool to estimate N and P emissions from agricultural soils in a LCA study

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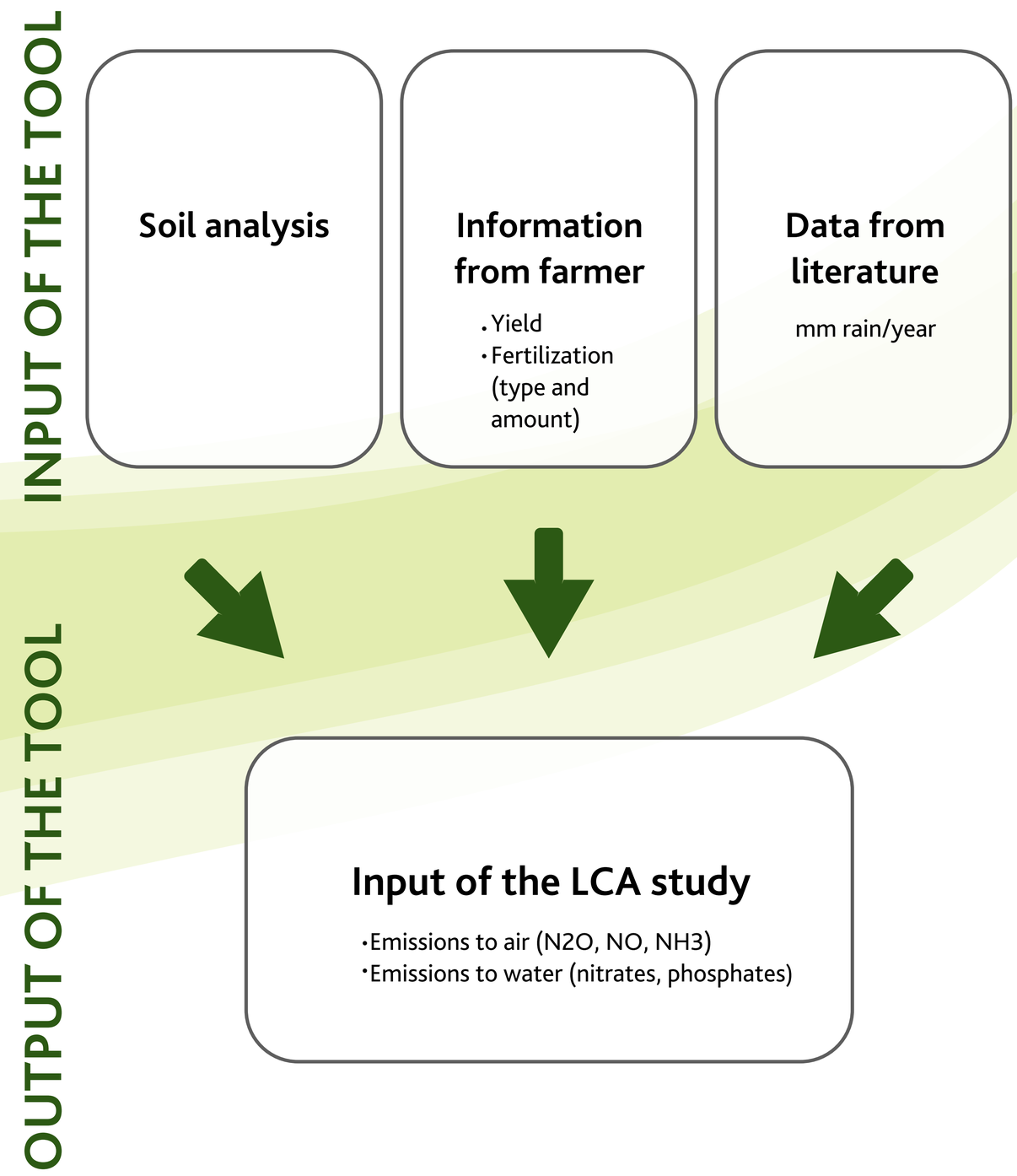
Emissions of nitrogen and phosphorus compounds from soil are among the most relevant sources of environmental impact in the life cycle of most agricultural products. The most important emissions in air are N2O, which has a high global warming potential, NO and NH3 which contribute to acidification. The most important emissions in water are nitrates and phosphates, which contribute to eutrophication of water. Agricultural practices such as fertilization and tillage could seriously affect these kind of emission.

It is often difficult to estimate these emissions because they depends on a multitude of factors such as climate conditions, soil characteristics and cultivated crops. There are models in literature that enable to estimate them with a certain precision but in many cases they are too complicated and require input which would imply money and time efforts that are not always available in a life cycle study. On the other hand it's possible to estimate emissions using emission factors or equations which however are too simplistic and don't permit for example to appreciate differences among different farming systems.

The aim of this study was to identify models that may be easy to handle and in the meanwhile enough accurate to take into account the main factors that influence the emissions. This is important in particular when performing a Life Cycle Assessment on a farm or on a territory level. With the individuated models a tool was then developed to permit the life cycle analyst to get the values of emissions by inserting a few required inputs.

The result of the work was a tool that enable the life cycle analyst to easily get quite accurate estimates of nitrogen and phosphorus emissions from agricultural soils. The development prospect for the tool could be an enrichment in the internal database to make it more specific for determined crops or geographical areas.



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