Municipal solid waste landfills - intermediate or final “sinks” for Phosphorous in transition economies?

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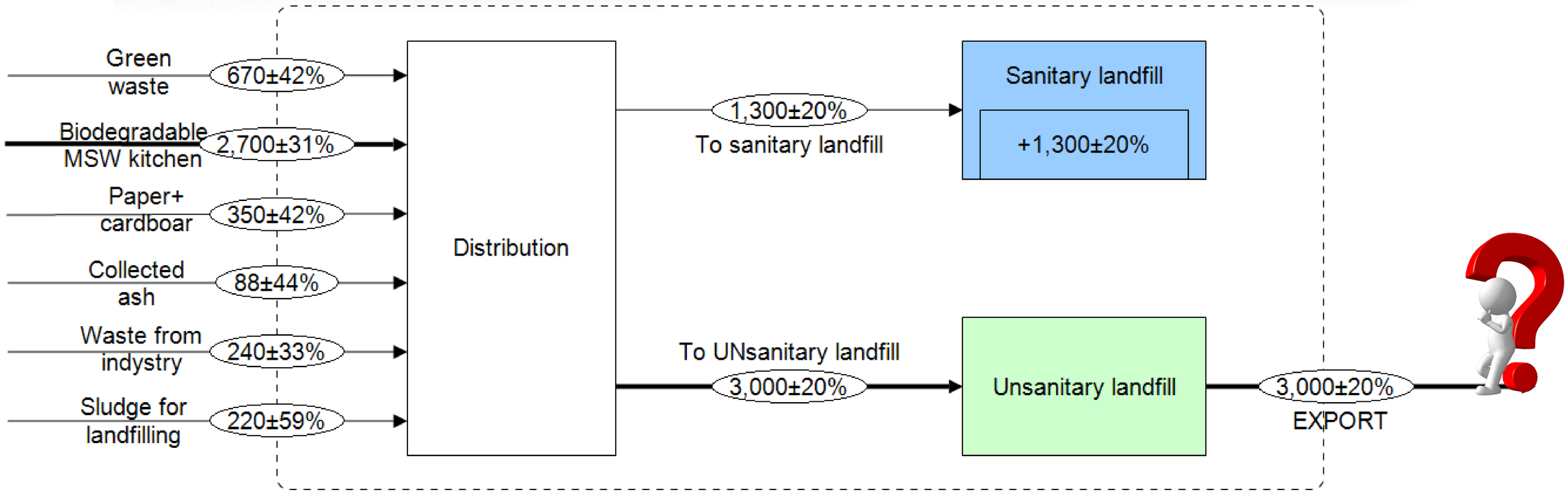
Serbia generates 2.5 million tons of municipal waste annually and this amount is increasing. Although the composition of the waste was changing during the years, the share of biodegradable waste represents the highest share of about 45% - 55%.

Landfilling of waste is still predominant solution and it is estimated that about 90% of it is disposed of without pre-treatment. There are only 10 sanitary landfills, on which about 30% of the total waste is landfilled, while other landfills are not constructed according to the EU regulations and cause emissions into the environment. 2170 such landfills were registered, where it is estimated that over 43 million m3 waste have been disposed.

Phosphorous is as non-renewable and essential resource with no substitute. Large the share of the biodegradable waste component which end up on landfills contained most of the nutrients and impact on loss in the phosphorus cycle. About 4000 tones of phosphorus originating from MSW are disposed on landfills each year. Phosphorus is hardly soluble his concentration in landfill leachates are very low, and main quantity will remain in waste.

Import: 4,300±20% t/a dStock: 1,300±20% t/a Export: 3,000±20% t/a



Phosphorus in landfill system

The aim of research is to:

- evaluate phosphorus quantity in landfills,
- analyze options for recovery and
- estimate the amount that can be extracted.

One of option for phosphorus recovery from waste streams is through biological treatment of biowaste and reuse residue as fertilizer. In this way, only new separate collected biowaste is treated, and it is not solution for accumulated phosphorus in already disposed waste. Other solution is waste incineration and recovery of phosphorus from ash. In this way it is possible to include old and new waste.