



Presentation from  
**2016 World Water  
Week in Stockholm**

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# ***The importance of forests for sustainable access to clean water in cities***

*Introduction to “Forests, water and sustainable growth of cities”  
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# 1) Forests conserve and deliver clean water



Forest (trees) maintain organic content in soil to infiltrate rain into the ground...

...where it is filtered and delivered steadily from the groundwater reservoir

## 2) Deforestation degrades soil and creates surface runoff, flooding and silted water



Soil organic matter is depleted and the compacted soil reduce rain water infiltration...

...creating runoff on soil surface and erosion...

...silting water and creating instantly swelling streams and rivers...

...reducing groundwater recharge and thereby less steady water delivery – especially during dry seasons.

### 3) Forest and landscape restoration high on agendas to secure safe water delivery

(among many other ecosystem services and socioeconomic values)



Re/Afforestation restores soil organic matter...

Or the re-introduction of trees (like in agroforestry)

It is really about restoring production of biomass for a healthy soil

**But** theoretical and empirical research say forest (trees) use more water (than any other vegetation) so bringing forest back may worsen the situation!



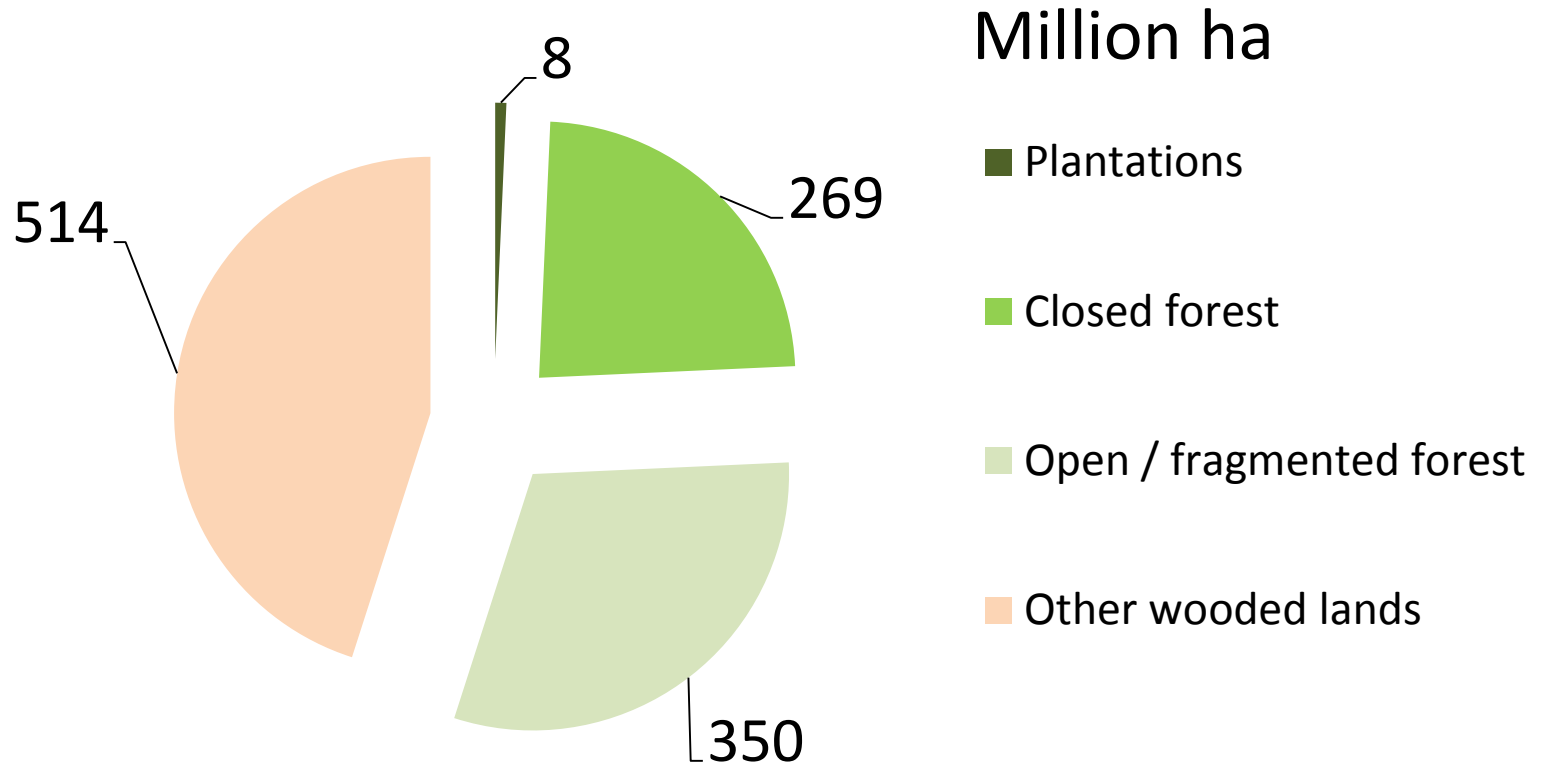
The empirical evidences relate to afforestation with forest plantations, often in areas with long dry season not forested earlier...

...trees using more water, but often not having a soil improvement factor...

...resulting in drying rivers in South Africa and India for example.

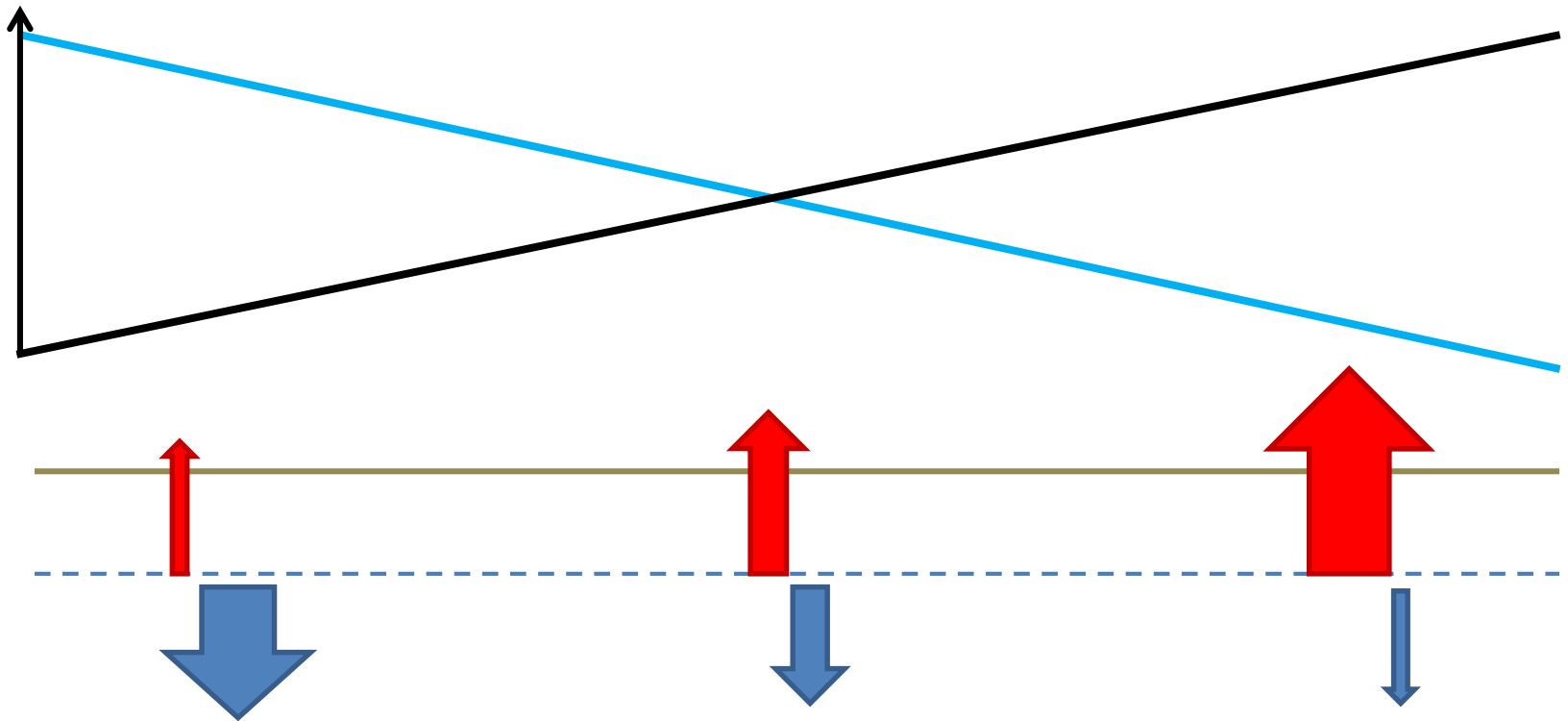
While... (pto)

...Ecosystem in drier regions are mostly not closed forests



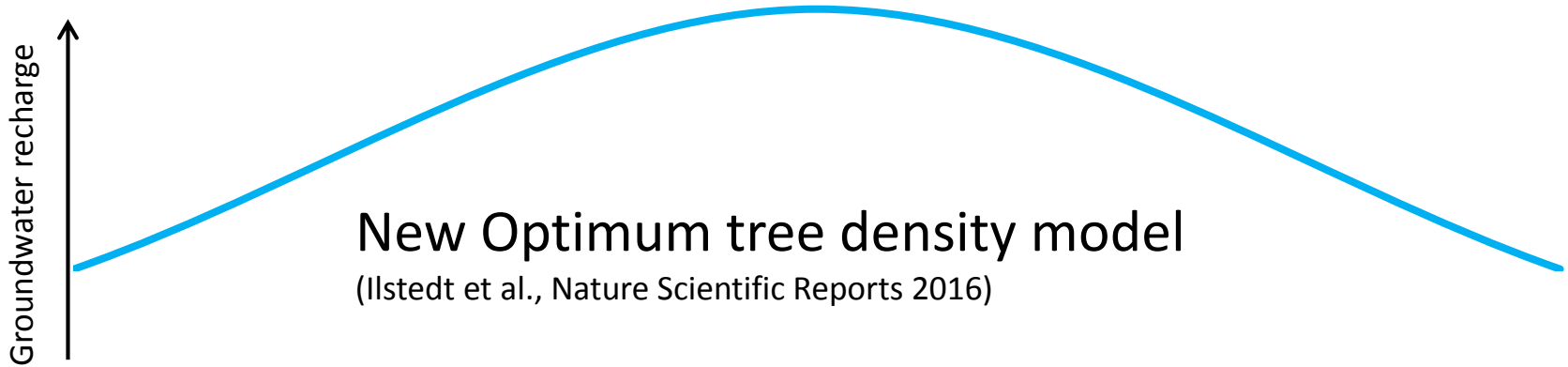
# The old paradigm: "Trade-off model"

■ Carbon   ■ Groundwater recharge   ■ Evapotranspiration





In each situation there is need for an optimum balance between the trees' effect on soil improvement and their water use.



Thus developing and restoring peri-urban landscapes can be many things depending of biophysical setting.

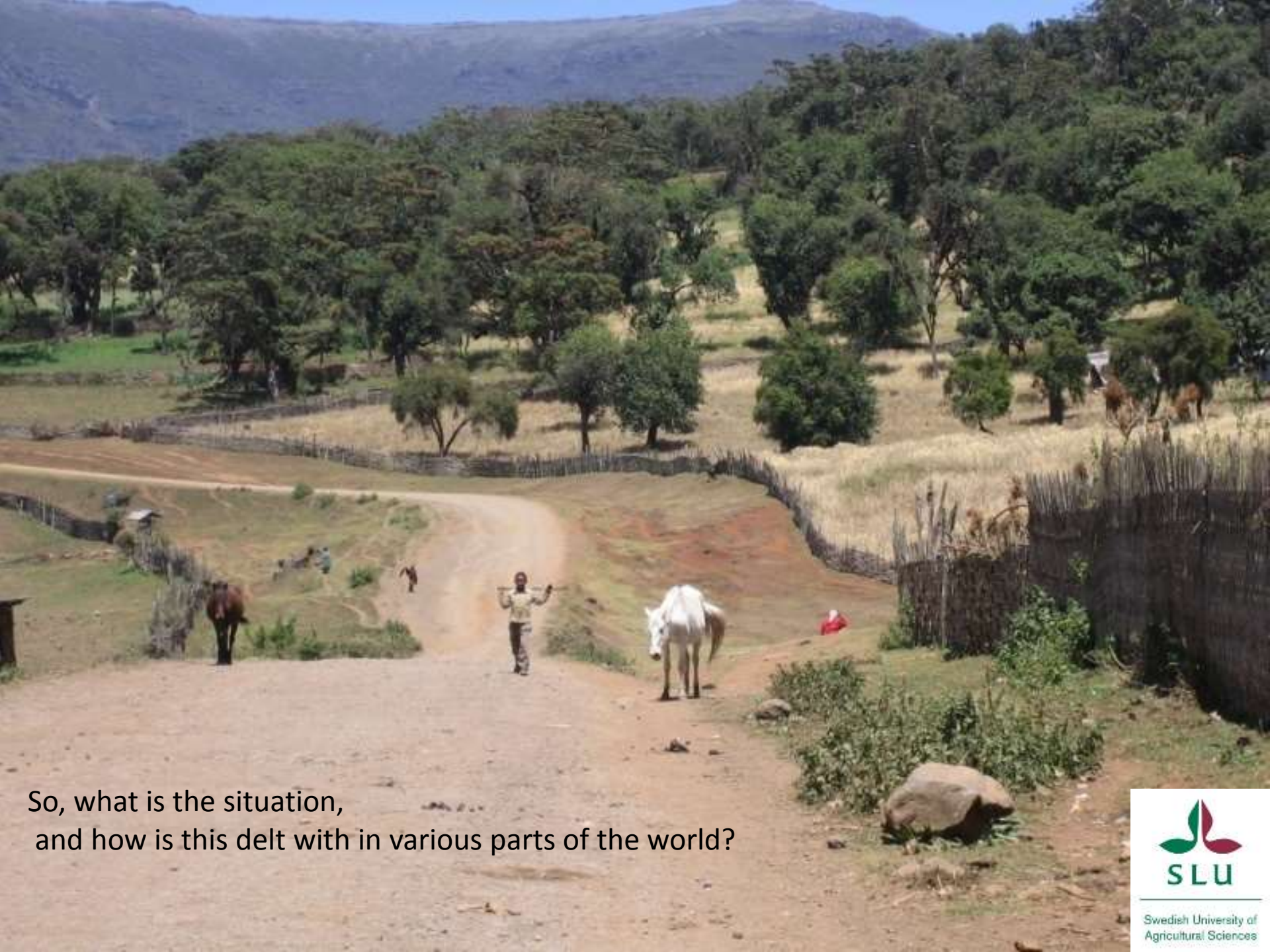


...And depending on socioeconomic setting.

Who, and how many, are living of this land?

How best invest to restore production and soils?

...While at the same time improving livelihoods and producing needs for the city  
(like wood, energi food, etc, apart from water)



So, what is the situation,  
and how is this dealt with in various parts of the world?