Nature based solutions for water: Real life examples

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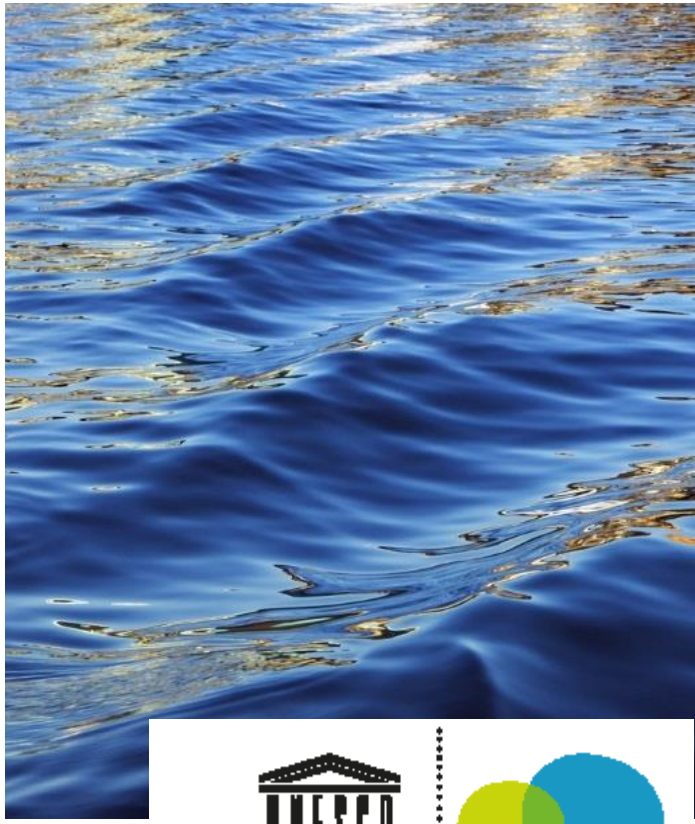


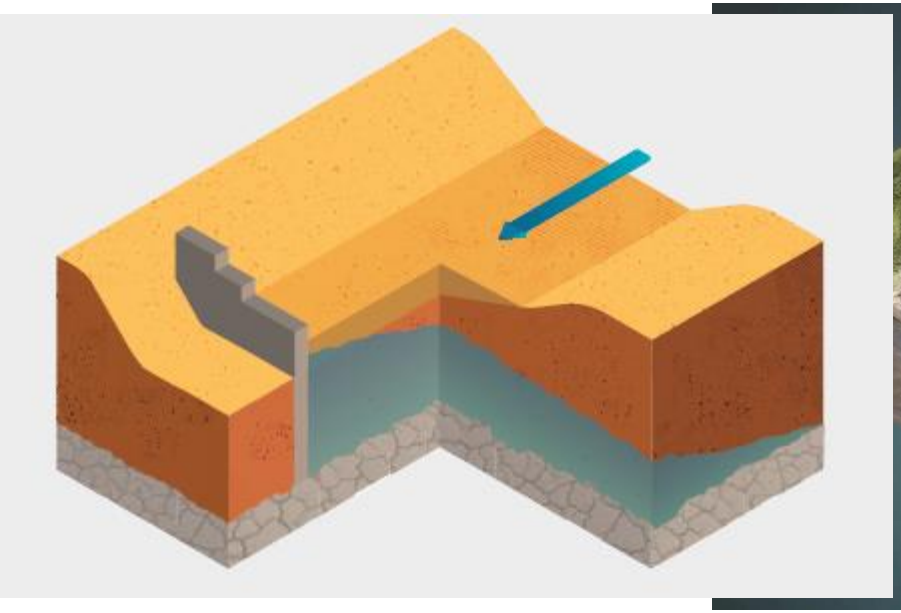
United Nations Educational, Scientific and Cultural Organization

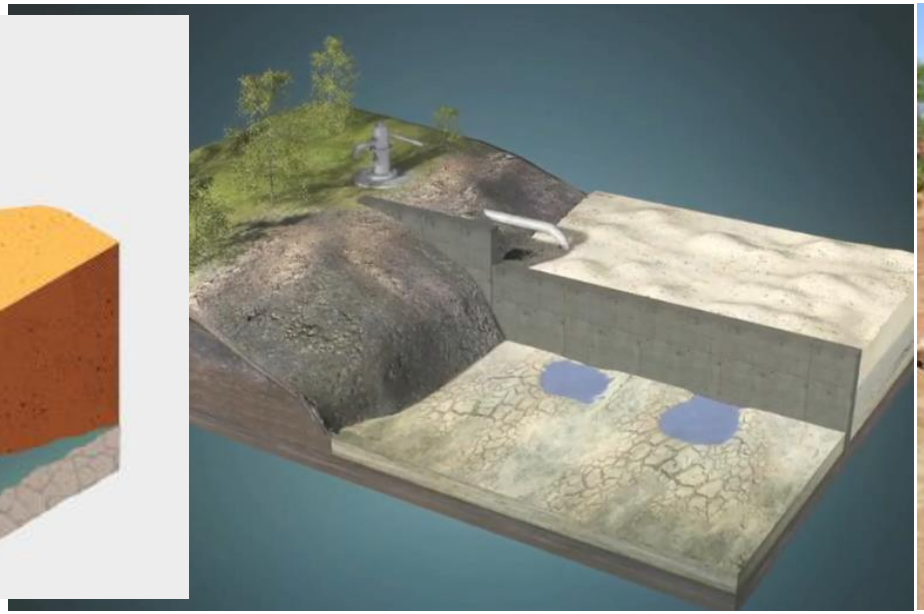
World Water Assessment Programme

Contents

- NBS for water quantity
- NBS for water quality
- NBS for food security / for land management
- NBS in urban settlements
- NBS and Industry
- Reviving indigenous knowledge and supporting local initiatives

1 NBS for water quantity: Sand dams in seasonal rivers





https://thewaterproject.org/sand-dams

http://www.asdfafrica.org/what-we-do/sand-dams

+ Sand dams in seasonal rivers gradually increases the volume of water stored in shallow aquifer.
+ Facilitates access to water / enable farmers to extend the cropping season / harvest a second crop: **Providing opportunities for enhancing income and livelihoods.**
+ Could potentially provide water storage for up to 60,000 km² of irrigated land in Africa.
+ Compare this with the 130,000 km² of irrigated land (in 2010).

NBS for water quantity: underground taming of floods

+ Ponds are for capturing runoff to recharge aquifers
+ Over 3 billion m^3 (almost 30%) of the wet-season flows could be harvested within the shallow aquifers of Chao Phraya River Basin.

+ This would reduce the magnitude and costs of flooding / offset the groundwater decline due to year-round pumping for irrigation/ generate around US$200 million of agricultural income per year: **Boosts the livelihoods of thousands of farming households**
+ Such a project would require converting around 0.1% (200 km2) of the river basin area for groundwater recharge

2 NBS for water quality: Constructed wetlands

Photo: Lina Al Rifai
https://www.slideshare.net/linaAlRifai/water-bioremediation-through-constructed-wetlands-87163574

+ The Litani River (Lebanon) is highly polluted and wastewater treatment plants are either non-functional or only partially operated
+ A constructed wetland system resulted in improved water quality (30% to 90% removal of the pollutant mass)

NBS for water quality: Buffer strips

+ Europe: the Common Agricultural Policy requires establishing buffer strips along watercourses:

  Approximately 1.6 million km² of farmland conformed with the standards.

  Coupled with the EU Nitrates Directive, nutrient loads to rivers have decreased.

+ Africa: US$10 million investment in riparian buffers, reforestation and implementation of improved agricultural practices can return an US$21.5 million.

Photo: https://en.wikipedia.org/wiki/Nature-based_solutions#/media/File:NRCSIA00041_-_Iowa_(2285)(NRCS_Photo_Gallery).jpg

3 NBS for food security: More rice with less water


Regular rice paddy

https://cultivationofcrops.blogspot.com/2016/09/brief-guide-rice-cultivation-system-and.html


System of rice intensification

http://r2da.wikia.com/wiki/File:Rice-fields-bali-indonesia_1152_12943513651-tpfil02aw-23643.jpg

+ Rice is a staple for nearly half the world's population.
+ The system of rice intensification is based on modifications in standard crop and water management practices.
+ SRI can save labour, water (by 25–50%) and seed (by 80–90%), reduce costs (by 10–20%), and **raise paddy output by at least 25–50%, often 50–100%**
+ Climate change adaptation

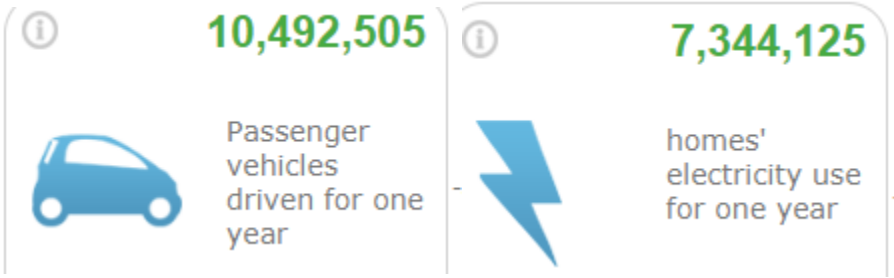
NBS for water quality and reduced erosion: Land management

+ Conservation agriculture:

The life expectancy of the Itaipu dam has been increased from 60 years to ~ 350 years :
WIN-WIN scenario for farmers and the hydropower production

+ Decrease in pollution of surface waters and lower CO_2 emissions:

The Conservation Reserve Program (US):
more than 110,000 km² of wetlands have been restored, soil erosion was reduced by 180 MT/year and carbon sequestration of average of 49 million tonnes of CO_2 equivalent per year.



https://www.epa.gov/energy/greenhouse-gas-equivalencies-calculator

4 NBS in Urban Settlements

http://www.chinadaily.com.cn/opinion/2017-09/26/content_32491069.htm

+ Sponge cities in China:

    - installation of green to collect runoff and remove certain pollutants.

    - ensures water availability for irrigation and cleaning purposes.

16 pilot 'sponge cities' will be constructed with a total investment of about US$1.25 billion

https://nacto.org/publication/urban-street-stormwater-guide/stormwater-elements/green-stormwater-elements/bioretention-swale/

5 NBS and Industry: Mining quarries

https://www.earthrangers.com/wildwire/take-action/dr-scotts-adventure-to-a-holcim-quarry/

https://www.ossga.com/multimedia/9/rehabilitation2010.pdf

+ Quarry areas become wetlands ,recreational areas, conservation or agricultural lands.

6 Traditional knowledge and local initiatives

Middle East

+ Himas in Jordan:

- Results demonstrated an increase in economic growth,
- Included in National Strategy

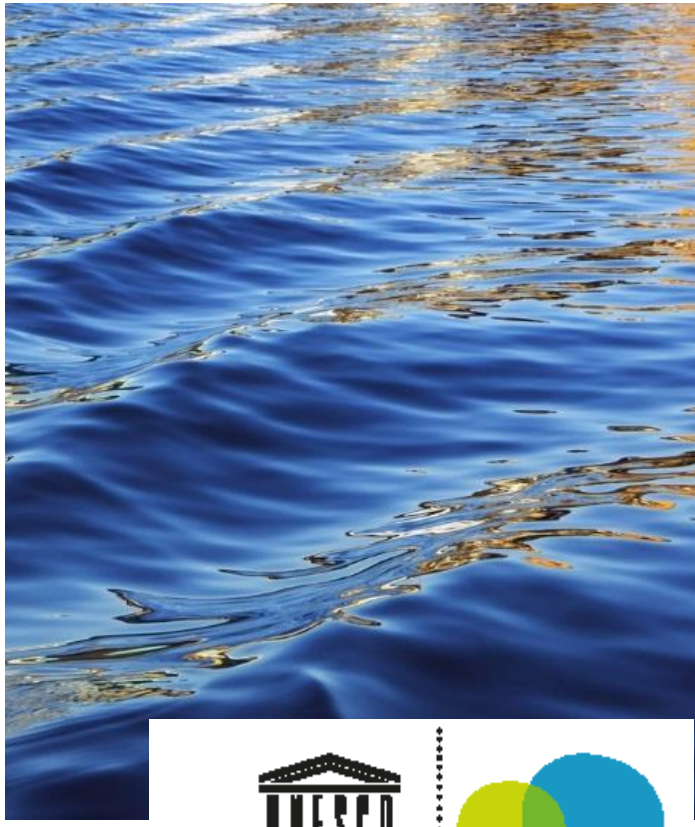
Photo: http://www.spnl.org/hima/hima-upper-akkar/

Africa:

- Nigeria: Ancestral water management systems and rehabilitation of the native vegetation,
- Reduced erosion, channel siltation and helped reconnect fragmented stream sections and native vegetation reserves.

For more information download WWDR2018 (EN/FR/SP/CHI/ARA)

http://www.unesco.org/new/en/natural-sciences/environment/water/wwap/wwdr/2018-nature-based-solutions/



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