# CO-BENEFITS

EbAs can offer multiple co-benefits for mitigating flood risk, protecting livestock and crops, and alleviating poverty, such as

- Climate change adaptation and mitigation
- Socio-economic development
- Environment protection and biodiversity conservation
- Contribution to sustainable economic development
- Improvement of soil quality and nutrient preservation
- Limitation of pollutants entering from river runoffs

# LIMITATIONS

- Requires large amount of land use: can be costly and completely disruptive to the livelihoods of stakeholders, particularly community members and local farmers.
- Land ownership issues: placing an EbA on private land is complicated in areas where it is not clear who owns the land. Gaining owners' approvals to place an EbA on their land can also be difficult. Placing an EbA on public land requires government approval.
- System of maintenance: may require personnel and ongoing funding for upkeep
- Destroyed in the event of major flooding: in catastrophic flood events, such as the floods of 2010 and 2018, EbAs may not be able to stop these floods entirely due to extreme flow rates that would rip planted vegetation out of the ground


WPI giz Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ) GmbH

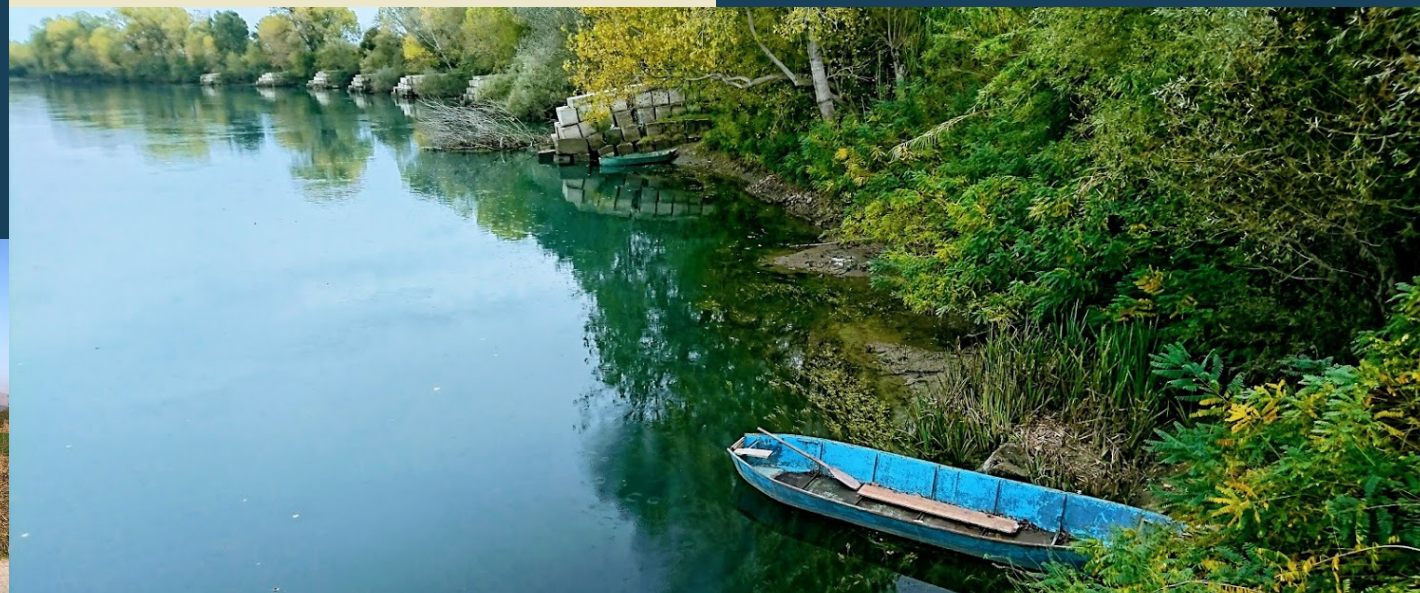
info@giz.de

https://www.giz.de/en/html/index.html


# PROPOSED ECOSYSTEM-BASED ADAPTATIONS

## FLOOD RISK MANAGEMENT

## SHKODËR, ALBANIA



https://www.mailordertrees.co.uk/products/carpinus-betulus-hornbeam-tree

https://www.first-nature.com/trees/populus-alba.php

# VEGETATION

The best types of species to use for a riparian buffer are species native to the land. Factors to also take into consideration are the sustainability, cost and time for them to grow. The species of vegetation for both proposed EbA includes:

- Fraxinus ornus
- Carpinus betulus
- Populus alba
- Populus canadensis
- Salix caprea
- Salix alba
- Quercus robur

These species have been conformed by ecologists to absorb large amounts of water and would also work well in a wetland location.

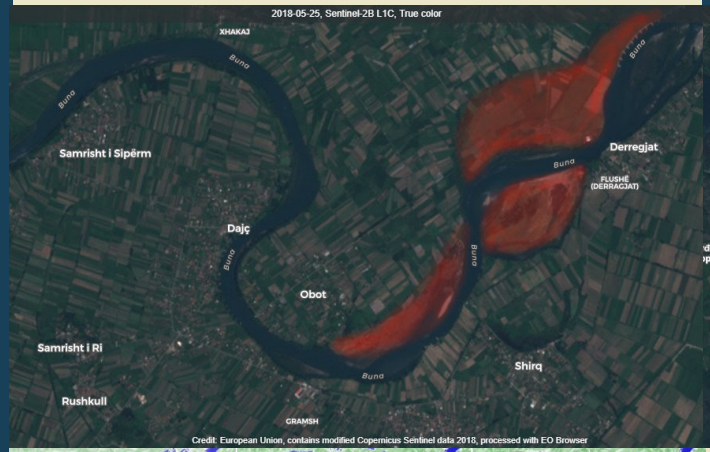
## The Need for EbAs

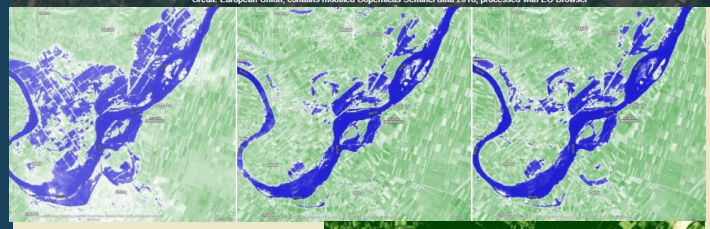
Through the use of online satellite mapping systems known as the Sentinel Hub, areas that are frequently flooded were identified. The data from the maps show these locations are flooded annually, not only in the events of catastrophic floods such as in 2010 and 2018. When it comes to extreme events, these locations are also where the floods start first. The different vegetation indicators show that floods have also severely affected the soil quality for agriculture after flooding events.

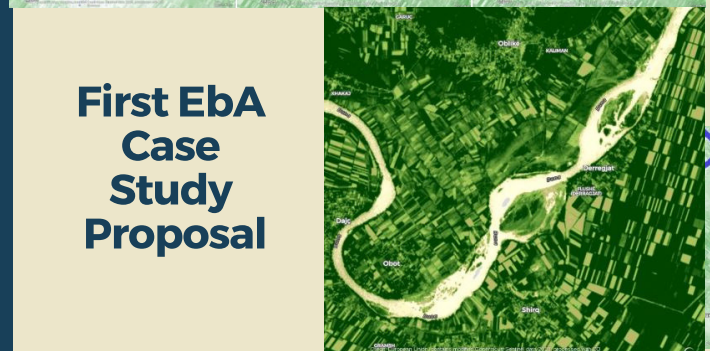
## First EbA Case Study Proposal

### Riparian Buffer Located Along the Buna River in Obot and Shirq

The first section of the EbA will be placed south-east of Obot i Vjete along the Buna River bend. The second section of the EbA is located in Urela, north of Shirq and southwest of Flusha along the opposite bend of the Buna River. These locations can be seen highlighted in red on the map below. The purpose for a riparian buffer EbA in this location is to reduce peak flow, erosion, and sediment and absorb overflow of water through the planting of vegetation along riverbanks.





## Second EbA Case Study Proposal

### Wetland Reforestation and Restoration Located in Dajc

The location of this EbA is south-east of the Belaj and Suka-Dajc villages, alongside the hills that can be seen in red in the map below. The purpose for a wetland reforestation EbA in this location is to replant and preserve forests with water absorbent vegetation to decrease soil moisture through transpiration. The roots of the trees also mitigate erosion and help disperse overflow of water evenly throughout the land.