

# Applied Research Partnerships with Developing and Transition Countries

## Swiss Universities of Applied Sciences and Universities of Teacher Education

### Project title

## Promotion of small waterbodies networks in the biodiversity hotspot Cerrado (Brazil), for their services to rural activities and to biodiversity

### Thematic focus

Water resource, biodiversity, ecosystem services

### Year

2013

### Project location

Cerrado (State of Goias), Brazil

### Swiss Institution

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(Dr Beat Oertli, Prof HES)

### Partner Institution

Universidade Federal de Goias (UFG), Instituto de Ciências Biológicas, Departamento de Ecologia  
(Dr Paulo de Marco Junior)



### Description

Small waterbodies are presently still widespread and numerous in the Brazilian Cerrado, even if under pressure of a growing agriculture. Ponds and small lakes are mostly artificial as a result of traditional rural activities (animal farming, small farm holdings, fishing). Each farm has its own network composed of several ponds. They provide a crucial water resource to rural activities. Ponds are undoubtedly also critical for maintaining the regional aquatic and terrestrial biodiversity in this world biodiversity hotspot.

### Objectives

- Identify the socio-economic values of small waterbodies in the Cerrado.
- Identify the ecological value of these waterbodies, e.g. their biodiversity and the ecological services they provide.
- Identify the threats on the small waterbodies and their provided services.
- Propose a strategy for promotion of small waterbodies networks, targeted to local (farmers, private owners, schools) and regional (e.g. administrative entities) stakeholders.

### Development relevance

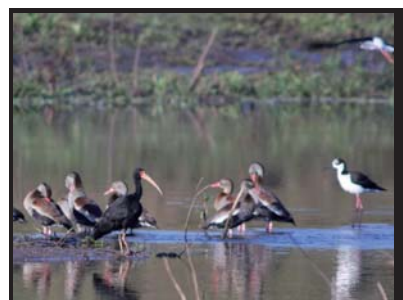
Ponds are used for rural activities and by animals (cattle, horses, wildlife). They satisfy also domestic use and irrigation of small production of vegetables and fruits. They may also be used for fish production consumed by farmers, or to another extend for angling.

The outcomes of the applied project have aims beneficial both for the environment and the society:

- Conservation of biodiversity linked to small waterbodies in the Brazilian Cerrado (one of the 34 world biodiversity hotspot),
- Promote the ecosystems services (of small waterbodies) to the rural communities.



Ponds provide a crucial water resource, for example for cattle



Ponds host also an exceptional biodiversity as birds, but also dragonflies, amphibians, aquatic plants.

# KFH

Rektorenkonferenz der Fachhochschulen der Schweiz  
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Swiss Agency for Development  
and Cooperation SDC

## Main features of the project

Three topics have been investigated in 74 ponds from a representative area from the Cerrado landscape dominated by pasture (625 km<sup>2</sup>, near Goiânia):

- the pond as a structural component of the landscape,
- the biodiversity which depends on the pond and on its surrounding environment (i.e. phytoplankton, aquatic plants, beetles, dragonflies, bugs, amphibians, aquatic birds),
- the socioeconomic component, which includes mostly farmers and its employees, but also others which may use pond in leisure activities.

### Main issues:

1. Pond density is particularly high if compared with others regions of the world. All are artificial: they are small sized reservoirs, near springs, or among or beside streams.
2. The predominant use of ponds is watering of cattle. Other frequent use is fish production, often as a secondary use for leisure. Other uses include: irrigation, protection against erosion, domestic activities (drinking, washing). The landowners expressed always a strong commitment to ponds, in direct link with the provided services. Many expressed also a clear interest in biodiversity.
3. Water quality underlines the good potential of most pasture ponds for hosting biodiversity. Nevertheless fish ponds are often nutrient overloaded.
4. The biodiversity surveys highlighted the role of ponds networks as "reservoirs" of biodiversity in the Cerrado landscape. All ponds hosted many species in the several investigated groups, including endangered species and also species endemic to the Cerrado. Nevertheless, discrepancies were also observed between the taxonomic groups, some being particularly well represented (e.g. beetles, bugs) when other were less rich (e.g. fishes, dragonflies). Amphibians, a group particularly important for the statute of world hotspot of biodiversity, were represented by 10 endemic species.
5. A didactical material (booklet, leaflet) has been produced and disseminated to the local stakeholders (e.g. land owners) and to schools, with the objectives: (i) to inform on basic knowledge on these ecosystems (water quality, biodiversity, functioning), (ii) to provide practical recommendations for "good" practices, enhancing the values, social and economical (targeted on identified uses) and ecological (targeted on hosted biodiversity). Furthermore, each farm owner received a "farm biodiversity portfolio" including general water quality parameters, a list of interesting biodiversity findings and a comparative measure of biodiversity of the other sampled ponds. This portfolio also included basic information about the legislation related to water and suggestions of good practices for promoting pond biodiversity.



Each farmer has built his own pond (or network of ponds) and manages it for the various services it provides.



Training course on "Biodiversity assessment" in a pond near Goiânia.