

Preservation of dry forest vegetation and tree planting measures to support the ecological and agricultural development of Valley View University (Accra, Ghana)

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The Project: Valley View University (V.V.U), a private university operated by the Seventh Day Adventist Church lies within the dry forest zone of the Accra plains; an area strongly affected by urban sprawl and characterised by low annual rainfall of ca. 700 mm. The campus covers 120 ha. Considerable portions of it are yet undeveloped and covered with either native dry forest stages or shrubland composed of exotic species.

In 2001, the V.V.U has committed itself to a holistic, ecological and sustainable development. Framed within a BMBF-project, V.V.U started in 2003 with the introduction of rain-water harvesting, waste-water management and the usage of human excreta as fertilizer on the university's own agricultural fields. The further development of the campus was designed in a detailed 'Ecological Masterplan', which prepared V.V.U for the envisioned increase of student numbers in the upcoming years. However, further development will include extensive building activities that will finally claim large portions of the yet-undeveloped land.

As part of a recent project within the German Climate-Change Initiative, we carried out a floristic survey to judge the relevance of the dry forest and thicket stages with respect to the preservation of local biodiversity and ecological sustainability. Additionally, the project includes the planting of a large quantity of trees on campus.

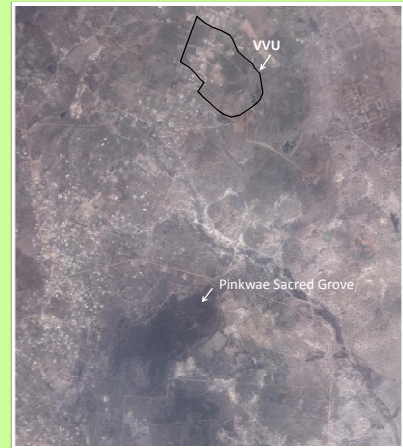


Fig. 1: Satellite image of the V.V.U campus situated between sprawling residential areas and grazed savannah. The only remnant stand of natural vegetation is Pinkwae Forest. The Distance between both is ca. 4 km. (Google Earth)



The Accra Plains cover ca. 2800 km² in south-eastern Ghana bordered by the Volta River, the Akwapim range and the Gulf of Guinea. The plains have distinctive climatic features (low rainfall, moderate temperature, high humidity – known as Accra-Togo coastal climate) and an according distinctive natural vegetation comprised of savannah and forest species¹.

Only small portions of natural vegetation are left in the Accra Region. Larger areas of relatively undisturbed shrubland and dry forest are so far only preserved at the Pinkwae Sacred Grove^{1, 2} and in the Shai Hills Reserve³ (Fig. 1).

The Floristic survey revealed 117 plant species in the shrubland of V.V.U campus. Among them were a few common weeds and some introduced, invasive and dominant species like the Neem (*Azadirachta indica*) and Leucaena tree (*Leucaena leucocephala*).

Ninety-five species, however, have to be considered as species native to the Accra plains and typical of the natural wooded savannah. Among them are 26 shrub species, 23 climbers (lianas) and 26 tree species. Many of the recorded tree species on campus were only found in small numbers and as juvenile or coppiced individuals. Due to regular, unauthorised firewood chopping by rural dwellers and occasional fires started by hunters, full-grown trees do not occur for most of the species. 27 species found on campus are listed as 'endangered medicinal plants' on a national scale^{4,5}. Most of them are rare due to habitat destruction and overexploitation for medicinal purposes.



Rourea coccinea - Connaraceae

Tapinanthus bangwensis - Loranthaceae

Psychotria sp. - Rubiaceae

Milletia thonningii - Fabaceae, the characteristic tree species on campus.

Gardenia ternifolia - Rubiaceae

Uvaria globosa - Annonaceae

Sarcocephalus latifolia - Rubiaceae



Fig. 2: The designated Preservation Areas, Tree Islands and Fruit tree plantations on campus. TI: Tree Island; red: already existing plantations.



Ximenesia americana - Olacaceae



Clausena anisata - Rutaceae



Flacourtia indica - Flacourtiaceae

References

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Project outcome:

- The results of the floristic survey show that it is essential to preserve larger portions of the still existing natural vegetation to ensure ecological sustainability of the future development of V.V.U.
- Designated areas (18 ha) have been proposed for preservation. The interference with future development according to the masterplan will be only minor (Fig. 2).
- Some smaller areas, heavily disturbed by fire and/or firewood gathering will be planted with native tree species (Tree Islands).
- The planting of 3500 orange trees and other fruit trees will increase the agricultural value added on campus.
- Approx. 1500 shade and ornamental trees will be planted in groves and avenues to improve microclimatic conditions in the developed areas of the campus.



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