

# Science Action in Schools for Sustainable Development (SAS4SD)

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## Introduction

SAS4SD brings together expertise from Swiss, Ghanaian, and Cameroonian institutions to collectively develop and implement secondary school science education that links theory to practice and raises awareness about environmental data and the need for sustainable development.

## Activities

The SAS4SD kick-off workshop took place at ETH Zurich in November 2017. Partners from Switzerland, Ghana, and Cameroon were all present, as was one secondary school teacher from Ghana. In 2018, reconnaissance trips to Ghana and Cameroon took place so that project partners could meet with local stakeholders and learn first-hand about the topics SAS4SD aims to address in secondary schools and communities.

## From data collection to community initiatives

The four pillars of the project are **data collection** from Trans-African Hydro-Meteorological Observatory (TAHMO) weather stations, development of **teaching materials**, **research activities**, and **community initiatives**.

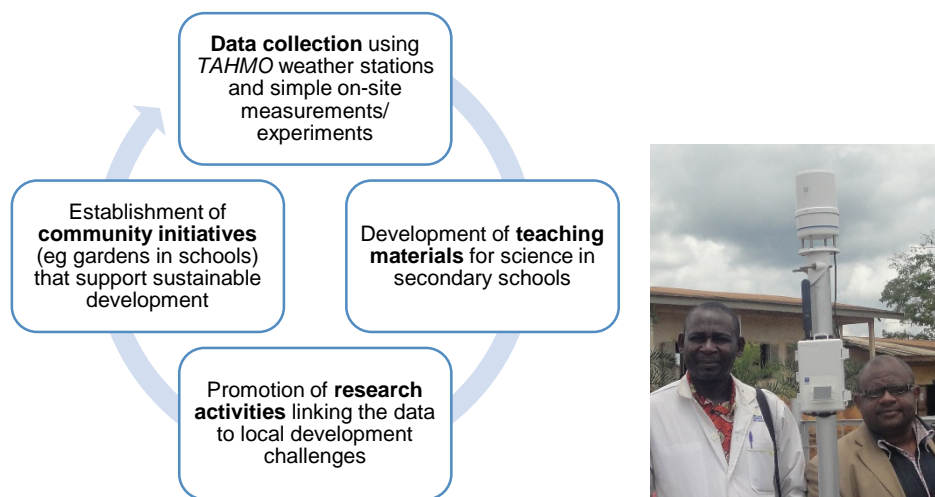


Fig. 1: The 4 pillars of the SAS4SD project



Fig. 2: Installation of a TAHMO station in Cameroon, 2018

The teaching material will address scientific and practical questions linked to climate change, natural hazards, deforestation, and sustainable agriculture and will touch on the following SDGs:



### GHANA – Reconnaissance trip February 2018



Fig. 3: Workshop with farmers, teachers, and students in Ghana (2018)



Fig. 4: Visit to TAHMO station at Bibiani high school, Ghana (2018)

### CAMEROON – Reconnaissance trip September 2018



Fig. 5: Workshop with secondary school teachers and university lecturers in Cameroon (2018)



Fig. 6: Observation of secondary school teaching in Cameroon (2018)

As a result of the reconnaissance trips and SAS4SD partner discussions, one of the key issues that was agreed upon for teaching material elaboration is «**climate smart cacao production**». The teaching material will touch on topics related to agriculture, climate change, water resources, and biodiversity.

Furthermore, the Ghana team expressed an interest in establishing «**live labs**» in secondary school science clubs where theory will be linked to practice, for sustainable development, through **waste management**, **vegetable gardens**, and **bee keeping** activities. The Ghana team is currently elaborating a concept note and plans to apply for further funding to support these activities.

An ETH MSc student, Anna-Lena Rittner, is doing research using data from TAHMO stations that are installed in Ghana and will elaborate SAS4SD teaching material as part of her thesis. She will be in residence in Ghana for 6 weeks, from December 2018 until January 2019.

## Outlook and next steps

**Meteorological data are being collected** at 80 TAHMO stations in Ghana, most of which are installed in secondary schools. The SAS4SD project installed the first 2 TAHMO stations in Cameroon in September 2018. This data collection forms the first pillar of the project.

Teaching material are currently being developed on **climate smart cacao production**, **climate change**, **rainfall**, **runoff**, and **erosion**. The material will include additional simple on-site measurements of environmental variables and processes that the students will conduct as part of experiments in science clubs. These activities represent the second pillar of the project.

Dr. Evans Dawoe, a project partner from Ghana, will spend a 6 month sabbatical at ETH (Jan.'19 - June '19) during which time he will advise Swiss partners on teaching material development, he will **engage in research related to SAS4SD**, and he will help finalize the Ghana concept note for **live lab activities that will link schools to communities**.

A focus on SDGs 2, 4, 6, 12, 13, and 15 will be incorporated into all aspects of the project including teaching material, research, and community initiatives.

## Project partners - Switzerland, Ghana, & Cameroon

UNIVERSITY	INDIVIDUAL	SPECIALIZATION
ETH Zurich (ETHZ)	Prof. Dr. Peter Molnar Prof. Dr. Johan Six Dr. Darcy Molnar	Hydrology, Fluvial systems Soil Sciences, Sustainable Agriculture Water Resources, Climate Change
Pädagogische Hochschule Luzern (PHLU)	Prof. Dr. Dorothee Brovelli Prof. Dr. Armin Rempfler Brigitte Kürsteiner	Natural Sciences, Physics, STEM Geography, Teacher Training Pedagogy, Intercultural Communication
University of Zurich (UZH)	Prof. Dr. Jan Seibert	Hydrology, Climate, Water Resources
Bern University of Applied Sciences (BFH)	Prof. Dr. Christoph Studer Prof. Dr. Jürgen Blaser	Natural Resources, Agriculture International Forestry, Climate Change
University of Cape Coast, Ghana	Prof. Dr. Peter K. Kwabong	Pedagogy, Entomology
University of Education Winneba, Ghana	Dr. Richard Kuffour	Pedagogy, Water Resources
University of Ghana	Dr. Irene S. Egyir	Agricultural Economics
Kwame Nkrumah Univ of Science and Technology Kumasi, Ghana	Dr. Evans Dawoe	Agriculture, Agroforestry
Ecole Normale Supérieure (ENS) Yaoundé, Cameroon	Prof. Dr. Marie-Thérèse Ambassa	Pedagogy
Ecole Pratique d'Agriculture de Binguéla (EPAB) Cameroon	Roland Amougou Etego	Agricultural Education
Ministry of Scientific Research and Innovation, Cameroon	Dr. Wilson Fantong	Hydrogeology expert