



# SAS4SD: Science Action in Schools for Sustainable Development

swissuniversities Consortia for Education and Research (COFER)

# SAS4SD collaborating institutions

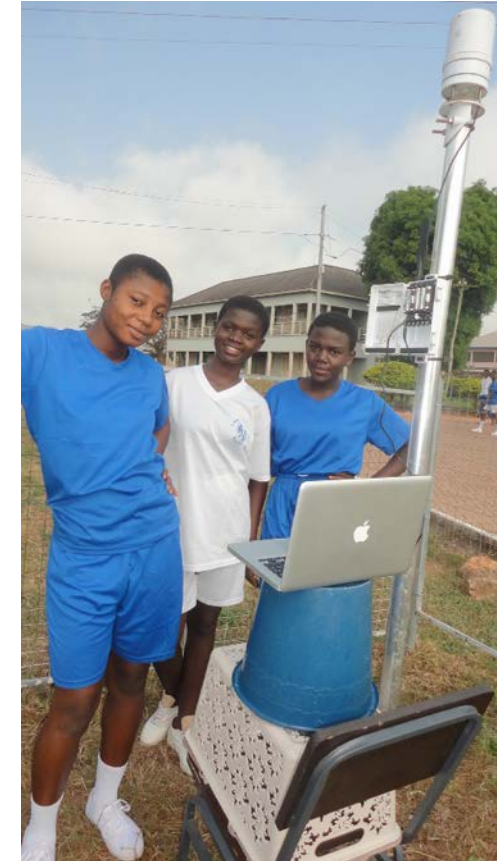
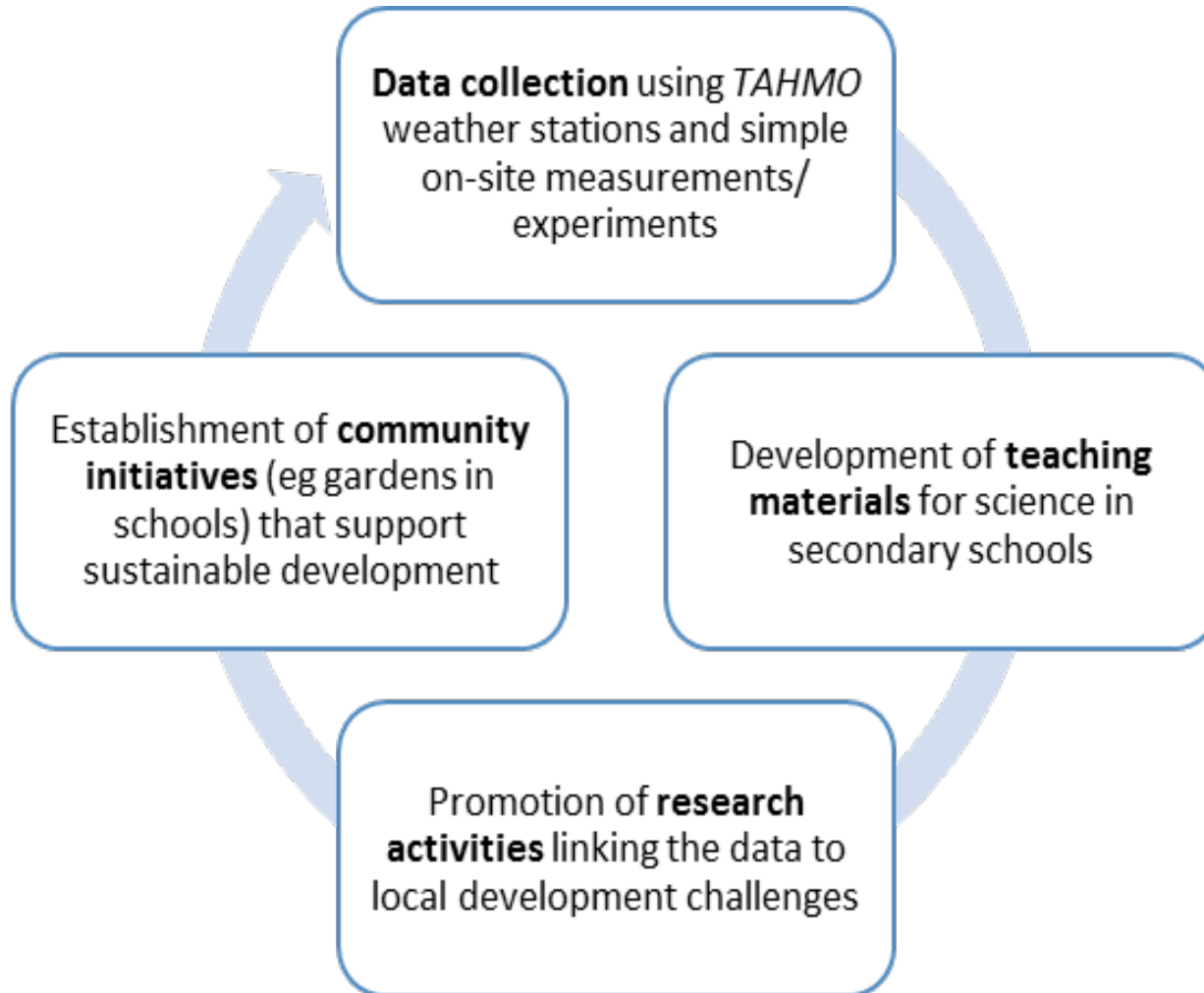
SWITZERLAND	GHANA	CAMEROON
ETH Zurich	Kwame Nkrumah University of Science and Technology Kumasi	Ecole Normale Supérieure de l'Université de Yaoundé 1
Pädagogische Hochschule Luzern	University of Education Winneba	Ecole Pratique d'Agriculture de Binguela
University of Zurich	University of Cape Coast	Ministry of Scientific Research and Innovation
Bern University of Applied Sciences	University of Ghana	

## Presenting today:

- Dr. Darcy Molnar, ETH
- Dr. Richard Kuffour, UEW
- Dr. Evans Dawoe, KNUST



# SAS4SD – from data collection to community initiatives



*TAHMO (Trans-African HydroMeteorological Observatory) station in Ghana*

# SAS4SD and the SDGs



Climatic data is used to assess measures to **ensure food security and sustainable agriculture**



**Responsible consumption** is promoted through learning and school based actions



Educational material **enhances scientific and mathematical skills**



Data provides an **understanding of local climatic conditions and vulnerability to climate change**



Meteorological data provide **insight into the available water resources**



**Behavioral changes regarding the exploitation of natural resources** is promoted through learning and school based actions

## SAS4SD activities – to date

- 2018 Reconnaissance trips to Ghana and Cameroon
  - Meetings with local partners and stakeholders
  - Visits to secondary schools
  - Assessment of the needs and conditions for science action in schools
- 2019 Dr. Evans Dawoe 6 month sabbatical at ETH Zurich
- 2019 Teaching material development
  - Module 1: Climate change adaptation and mitigation
  - Module 2: Climate smart cocoa production
  - Available at <https://sas4sd.ethz.ch/education/educational-material.html>
- August 2019 Teacher training in Ghana
  - 40 secondary school teachers
  - 2 pilot schools



# SAS4SD August 2019 teacher training Kumasi, Ghana



Day 1: 40 teachers from 30 schools





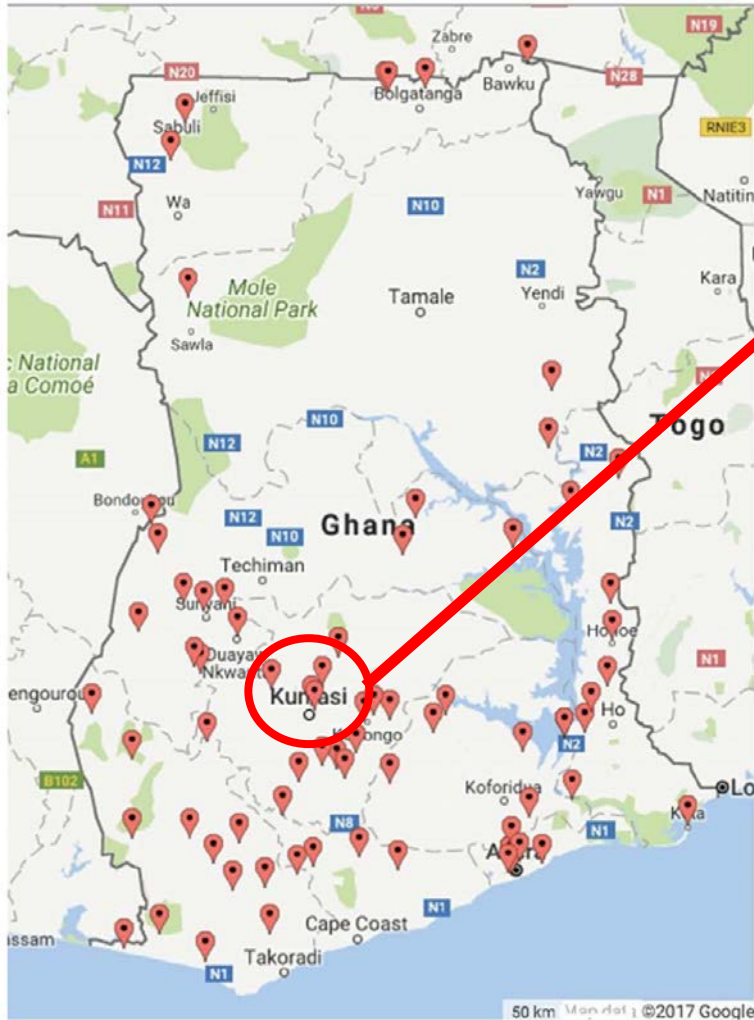
# SAS4SD August 2019 teacher training Kumasi, Ghana



Day 2: 10 teachers from our 2 pilot schools



# SAS4SD – Ghana pilot studies – testing of teaching material



Bibiani SHTS and St. Monica's SHS



TAHMO stations in Ghana

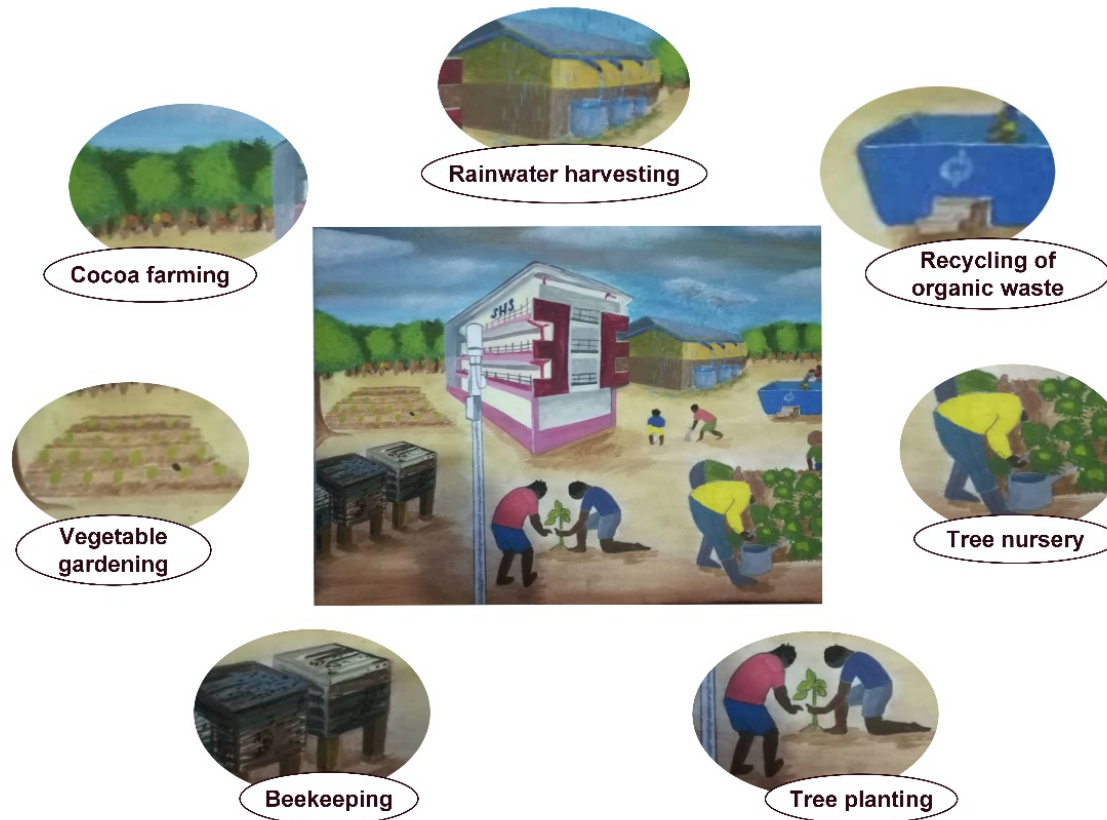


# SAS4SD Teaching Materials – next steps

- **Testing Phase:** Testing of SAS4SD teaching material in secondary schools (2019/2020). WhatsApp teacher group for communication.
- **Refinement Phase:** Refinement of SAS4SD teaching material based on secondary school teachers' input and evaluation forms (early 2020).
- **Dissemination Phase:** Training of future secondary school teachers at teacher education universities in Ghana & Cameroon (summer 2020).

# SAS4SD Community initiatives – next steps

- Collaboration with the Ghana Youth Environmental Movement (GYEM) for the implementation of after-school club activities focusing on **waste management, rainwater harvesting, vegetable gardens, tree planting, and bee keeping.**
- Search for sponsorship of “Green School” initiatives in secondary schools in Ghana.





# SAS4SD Research initiatives – next steps

Development of research projects in collaboration with KNUST (Kumasi, Ghana) through the CLOC West Africa Network for Water and Life (NEWAL).

- Winter school in Kumasi, February 2020
  - 20 university students from Switzerland and West Africa,
  - Identification of joint research activities,
  - Focus on Zero Hunger (SDG2), Clean Water and Sanitation (SDG6), and Climate Action (SDG13).
- Summer school in Switzerland, August 2020
  - Sharing of research results and elaboration of future joint research activities for 2021 and beyond.

THANK YOU FOR YOUR ATTENTION  
**QUESTIONS?**



# Contact information & links

**Dr. Darcy Molnar** - ETH Institute of Environmental Engineering, [darcy.molnar@ifu.baug.ethz.ch](mailto:darcy.molnar@ifu.baug.ethz.ch)

**Dr. Richard Kuffour** - University of Education Winneba (Ghana), Department of Environmental Health and Sanitation Education, [rakuffour@gmail.com](mailto:rakuffour@gmail.com)

**Dr. Evans Dawoe** - Kwame Nkrumah University of Science and Technology Kumasi (Ghana), College of Agriculture and Natural Resources, [elkdawoe.canr@knust.edu.gh](mailto:elkdawoe.canr@knust.edu.gh)

<http://www.sas4sd.ethz.ch/>

<https://sas4sd.ethz.ch/education/educational-material.html>

<http://tahmo.org/>

<https://school2school.net/> (access to TAHMO station data)

# TAHMO (Trans-African HydroMeteorological Observatory) stations

## TAHMO Station specifications

- Solar charger with 6-month backup battery
- Hourly GPRS reporting with 5 minute readings
- Soil moisture and groundwater sensors available upon request.
- Sensors: Anemometer, Rain gauge, Pyronometer, Barometer

Parameter	Range	Resolution	Accuracy
Wind speed	0-60 m/s	0.01 m/s	3 %
Wind direction	0-359°	1°	3°
Temperature	-40-80 C	0.1 C	0.5 C
Relative humidity	0-100%	0.1%	3%
Vapor pressure	0-47 kPa	0.01 kPa	0.3 kPa
Precipitation	0-230 mm/hr	0.014 mm	5%
Solar radiation	0-1,750 W/m <sup>2</sup>	1 W/m <sup>2</sup>	5%
Barometric pressure	49-109 kPa	0.015 kPa	0.4 kPa

*Weather station at Bibiani SHTS, Ghana*

