

Solar Powered Irrigation Systems (SPIS) in Cocoa Farming in Ghana

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By

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SOLAR GHANA COCOA

german cooperation
DEUTSCHE ZUSAMMENARBEIT

AGI
Association of Ghana Industries

BSW
GERMAN SOLAR ASSOCIATION

PartnerAfrica Project (BSW-Solar, AGI) 'Solar Ghana Cocoa'

Under the Special Initiative Decent Work for a Just Transition of the German Federal Ministry for Economic Cooperation and Development (BMZ)

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Background

- Overview of Ghana's Cocoa Sector

Overview of Ghana's Cocoa Sector

- Ghana is the second largest producer of cocoa in the world, next to Côte d'Ivoire.
- Ghana produced about 689,000 metric tons of cocoa beans in 2021/2022 compared to 811,250 in 2018/2019 and 904,446 in 2017/2018.
- Cocoa directly provides the livelihood of over 1.2million cocoa farmers and additional millions whose livelihoods are generated along the supply and services chain.
- The cocoa industry contributes about 11.9% of Ghana's total export earnings and accounts for about 8% of Ghana's GDP (COCOBOD, 2017).
- Most cocoa farms in Ghana are small (1-5 ha) and run/maintained by small-holder farmers
- Yields are low (average 500 kg/ha). Mortality rate of young planted cocoa trees is about 30% per year during the dry season.
- Research proves that young cocoa trees need 10 liters of water daily and mature cocoa trees need 30 liters daily. If this water requirement is achieved, the cocoa will yield throughout the year.
- This water requirement can only be achieved through IRRIGATION.

02

SPIS in Cocoa Farming in Ghana

- Current status of SPIS in Cocoa Farming in Ghana
- Key results
- Pumptech and FOB SPIS projects

Current status of SPIS in Cocoa Farming in Ghana

- The use of Solar Powered Irrigation Systems (SPIS) in cocoa farming in Ghana is very low
- Many cocoa farmers are not aware of the use and benefits of SPIS
- Currently, the Ghana Cocoa Board (COCOBOD), the state regulator, has installed around 60 SPIS for cocoa famers on a pilot basis
- Other private players such as Mondelez, have also installed SPIS for their farmers

Piloted SPIS installations

EVALUATION OF ANNUAL RETURNS FROM 1HA PILOT COCOA IRRIGATION BY GHANA COCOA BOARD FROM 2019 T0 DATE

	Expenditure (Euro)	Yield (Kg)	Income (Euro)
Non Irrigated	340	500KG	108
Irrigated	504	3000KG	2,133

03

Conclusion

- ESG
- Summary

Solar irrigation is a climate mitigation technology to reduce greenhouse gas (GHG) emissions in agricultural production. Despite its potential, small-scale farmers are currently unable to afford photovoltaic (PV) systems and resort to using the traditional diesel-powered pumps for irrigation.

The project aims to analyze the social, economic, and environmental aspects of introducing solar irrigation systems from the perspective of small-scale farmers in Ghana. Applying socio-economic and environmental analyses to the case, the study found the environmental benefits of solar irrigation in terms of the reduction in GHG emissions and the avoidance of emissions of air pollutants such as carbon monoxide, nitrogen oxides, sulfur oxides, and particulate matter.

Regardless of the rather low awareness of environmental sustainability, most farmers are interested to invest in solar irrigation systems

Summary

- Productivity of cocoa yields in Ghana still remains low due to several factors, not least climate change which has affected rain fall patterns
- There is huge potential for Solar Powered Irrigation Systems (SPIS) to increase yield and improve the livelihood of the smallholder cocoa farmer
- This can also have a ripple down effect on job creation, combating climate change and contributing to Ghana's GDP
- A lot still needs to be done in creating awareness about the benefits of SPIS among cocoa farmers. The PartnerAfrica Project (BSW-Solar, AGI) 'Solar Ghana Cocoa' has held information events for so far 15 cocoa cooperatives to create awareness about the use and benefits of SPIS
- The main barrier to unlocking the potential of SPIS in cocoa farming is FINANCE
- Thus, innovative financial models are required to unleash this potential
- The PartnerAfrica Project (BSW-Solar, AGI) 'Solar Ghana Cocoa' has developed an adapted business model for smallholder cocoa farmers with 1-2 ha of land

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