Post-pandemic/post-disaster Recovery of Livelihoods Resilience and Green Roads for Water

Photo by Simone Verkaart

GREEN ROADS FOR WATER

META META

Flood-Based Livelihoods Network Foundation

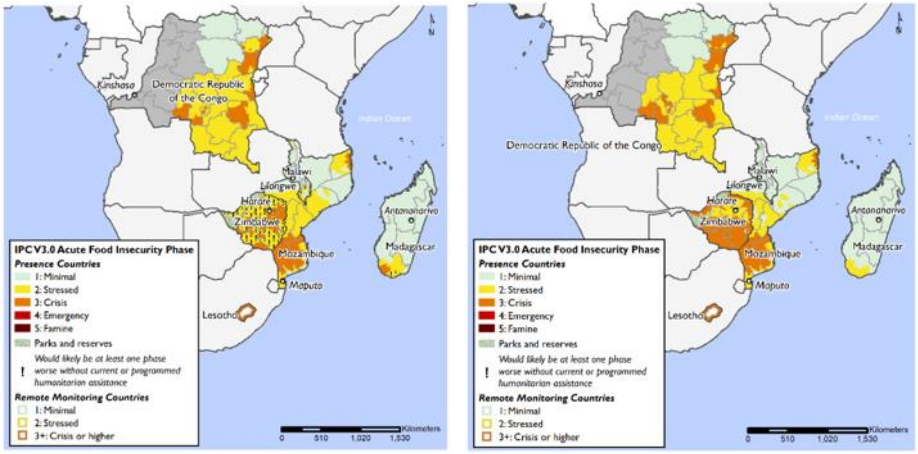
From emergency …

Emergencies (droughts, locusts) do not go away:

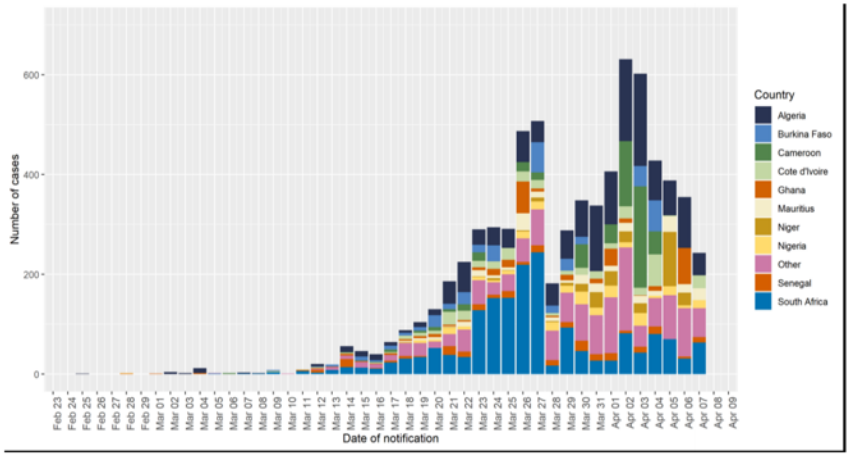
- The rainy season across Southern Africa in 2018/19 was one of the driest on record for nearly 40 years
- The severe drought has resulted in below-average regional cereal output and increasing food insecurity across many countries
- Livestock conditions are poor across southern and central areas of the region
- The number of food-insecure people in Southern Africa is projected to peak at 12.5 million through March 2020
- The significant deterioration in food security conditions is mainly due to reduced harvests that have cut household food stocks

On top of this COVID-19 – infection and quarantining

- Increased morbidity and mortality
- No movement of daily farm labour:
  - Loss of income of most vulnerable group
  - Affects harvested quantities (esp of perishables)
  - More weed infestation – more weed seeds mixed with grains
- Slowed down operations of agri-business and agricultural frontline workers



Predicted food security outcome in Southern Africa, February to May 2020 (left) and June to September (right). Source: FEWS NET



Number of confirmed COVID-19 cases in the WHO African Region by country, 25 February – 7 April 2020. Source: WHO

To recovery….

- Roads are vital to reach highly affected areas – focus on durable rural/ community roads
- Access to water key to Public Health
- Labour programmes: build back better – make road water harvesting and road water management part of community road building

To recovery…

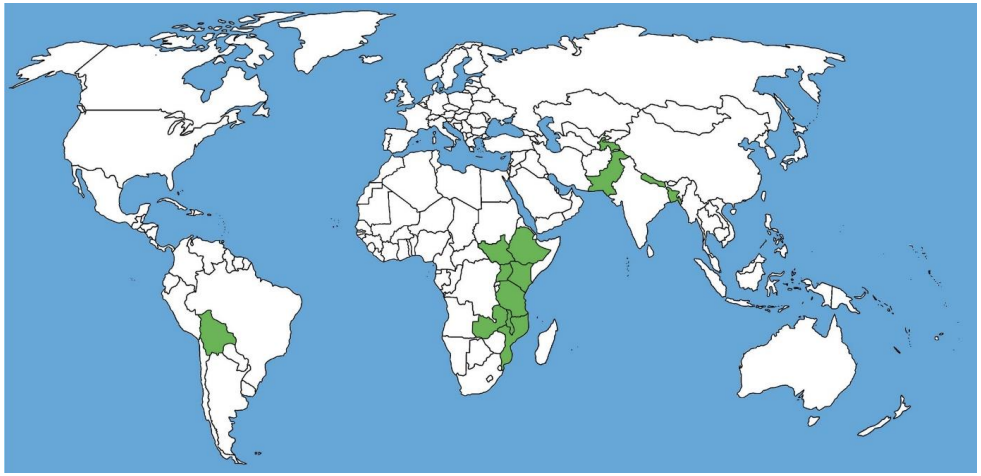
Green Roads for Water

What are the Green Roads for Water?

- ✓ Roads that increase the climate resilience of rural communities
  - Roads that improve the water supply of rural communities
  - Road that are used for flood protection and flood relief
  - Roads that provide employment opportunities to rural communities
- ✓ Roads that have secure transport functions
  - Roads that connect rural communities to foods, services and markets

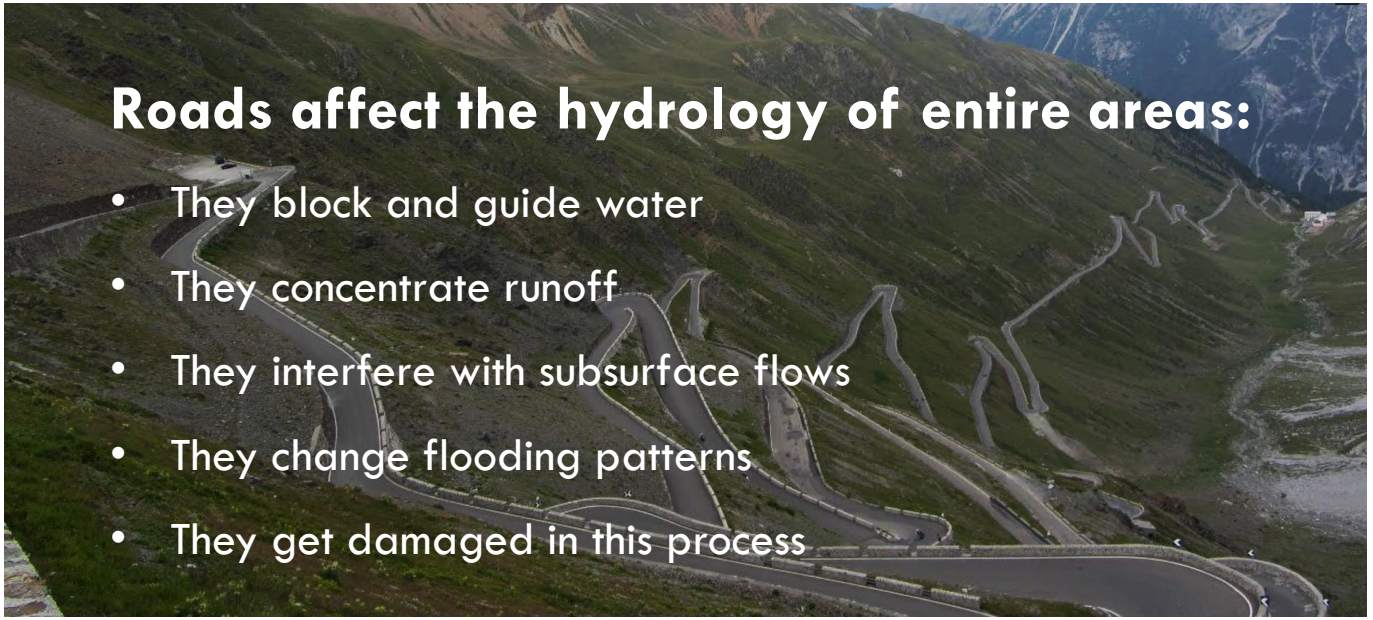
Green Roads for Water Program

- Initiated by MetaMeta
- Aim: To have roads for systematically used for water management, regreening and climate resilience and introduce as standard in at least 50% of countries in Asia/Africa by 2025
- Supported by: The World Bank, GRP, NWO, NERC, RAP3, Blue Gold
- Development of GR4W Guidelines and Guided Learning packages
- Active in more than10 countries
- Outreach > 6 M people



To recovery….

Green Roads for Water



Common problems caused by roads:

- Water logging (loss of crops and health problems)
- Flooding (road damage and limited connectivity)
- Landscape degradation (loss of agricultural land around the roads)

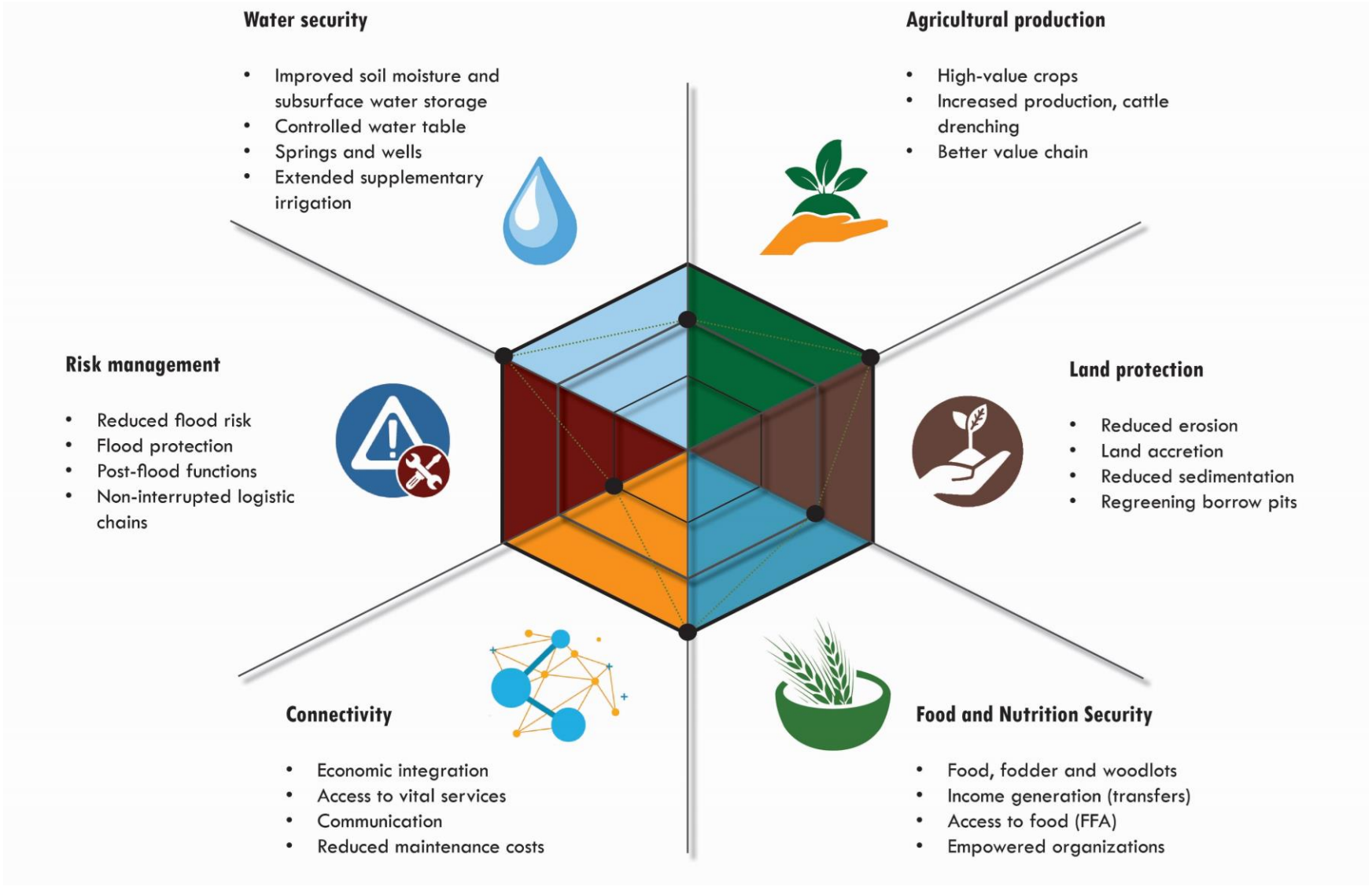


Green Roads can turn things around …

Roads can be systematically used as instruments for water harvesting and as such contribute to **livelihoods resilience** and **water and food security.** By systematically using the excess of water from roads, the **road infrastructure is protected from water damage** and thus can be used by the rural communities all year round (for accessing food, services and markets). The structures that are suggested for harvesting water from roads are low tech which offers **employment opportunities for local communities on road construction and maintenance.**



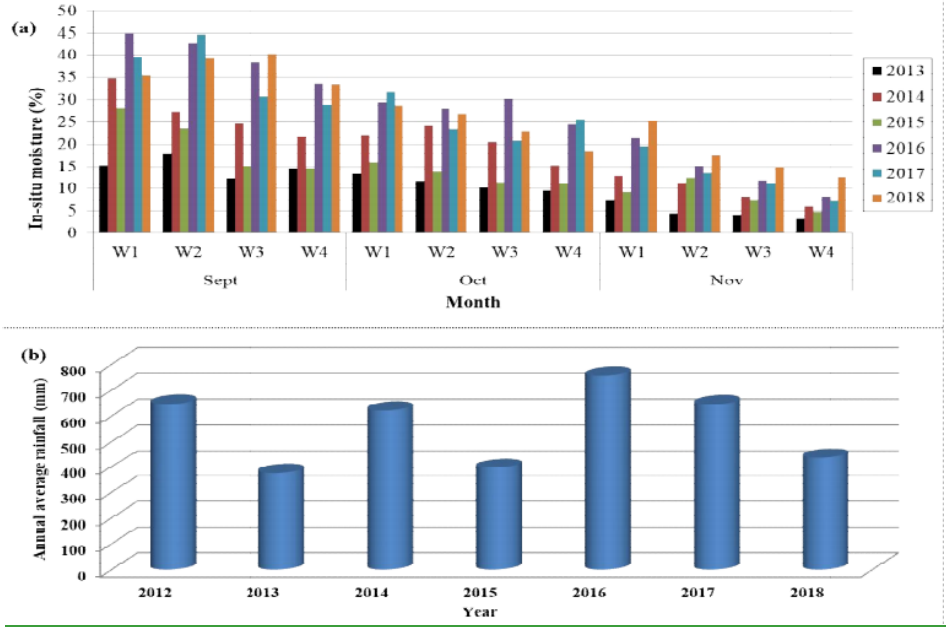
Green Roads for Resilience and Recovery co-benefits



Impacts of Green Roads in Ethiopia

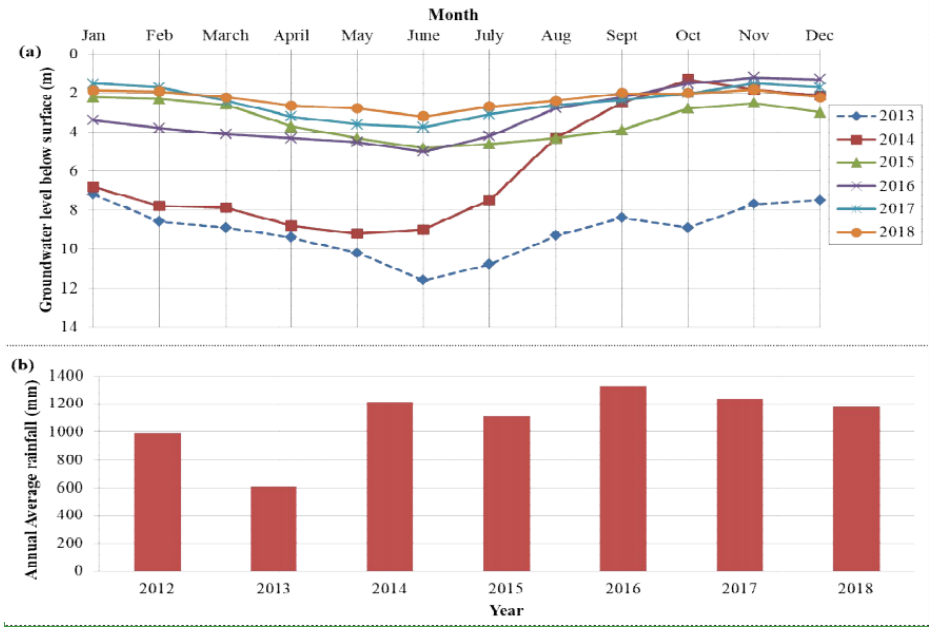
Raised water availability after implementing Green Roads in Ethiopia at a large scale

Additional information on the benefits of GR4W on rural livelihoods. This blog was published by GRP after a site visit at the road-water-harvesting sites implemented in Northern Ethiopia during the GR4W program



(a) In-situ moisture distribution in soils (before and after the construction of structures that divert runoff from culverts into farmlands along the Mekelle road (Kihen), Tigray, Ethiopia. Construction of the diversion structures was done on May-June 2014. Monitoring was done for the period September years 2013 to 2018. (W1= Week one; W2=Week two; W3=Week three and W4=Week four). (b) Rainfall distribution for (ENMSA, 2018).

Source: Kifle, W., Berhane, G., Taye, A., Kebede, M., & Marta, A. P. (2019). Practices and Hydrological Effects of Road Water Harvesting in Northern Ethiopia: Towards Design of Multi-Functional Infrastructures. *Momona Ethiopian Journal of Science, 11*(2), 159-186



a) Groundwater fluctuation in Selekleka area, Tigray, Ethiopia (at downstream of a check-dam which was constructed in the period January is designed to store improved at downstream of the box culvert b) Rainfall distribution for the year 2012 to 2018 (ENMSA, 2018)

Source: Kifle, W., Berhane, G., Taye, A., Kebede, M., & Marta, A. P. (2019). Practices and Hydrological Effects of Road Water Harvesting in Northern Ethiopia: Towards Design of Multi-Functional Infrastructures. *Momona Ethiopian Journal of Science, 11*(2), 159-186

Costs and benefits of Green Roads for Water

	Mechanized method	Hybrid method (Mechanized and HIMO)	HIMO method (high intensity manual labor)
Unit Costs (averages) *for unpaved feeder road construction without GR4W*	39,000 USD/km (baseline)	35,100 USD/km	31,200[1] USD/km
Incremental unit cost with GR4W (one off)			+ 1,800[1] USD/km
Incremental benefit with GR4W (Cumulative Annual Dividend of GR4W)			~+ 17,000[1] UDS/km
Benefits	~ 41 % (baseline)	~ +20% over baseline; or 46 %	~ +25% over baseline; or 51 %

[1] World Bank Guidelines on Green Roads for Water

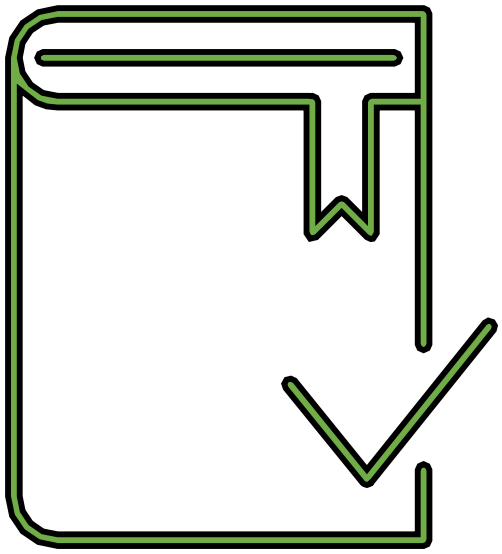
Green Roads for Water **Guidelines**

Supported by: WORLD BANK GROUP

We have developed Guidelines for integrating water management and climate-change adaptation in the design, construction and maintenance of roads.

These Guidelines describe how the negative impact of roads on the surrounding landscape can be turned around and how roads can become instruments of beneficial water management.

These Guidelines are targeted at road planners, infrastructure investors, private road developers – be it at the World Bank, the partner countries or elsewhere. They are also targeted at other communities of practice: those that work in flood prevention, land scape restoration, agricultural development, climate resilience, disaster risk reduction and environment in general.



- Approach
- Geographies
- Techniques
- Governance
- Economics
- Technical
- Annexes

Please access the draft version of the Green Roads for Water Guidelines through this link. The official version will be published soon by the World Bank.

Green Roads for Water: worldwide experience

Retaining water with road drifts

Feeding soil moisture with road drainage

Roadside tree planting

Green Roads for Water: worldwide experience


Gardening with roadside wells


Borrow pit converted to water storage


Road embankment creating storage reservoir

Green Roads for Water: worldwide experience

Harvesting fodder from culvert run-off

Water from spring opened by road construction

Safeguarding wetland functions with low embankment road

Road side recharge structures

Green Roads for Water: worldwide experience

Roads created from storage excavation

Roads leading to flood shelters, roads serving as (post) flood shelters as well

Roads controlling water tables between high and low land

Gated culverts for water management

Green Roads for Water: worldwide experience

Employment opportunities for rural communities on road construction

Way forward

Prepare:

- Connect with national programs, green finance initiatives, academia, united nations, bilateral & multilateral organizations, private sector foundations, contractors and NGOs
- Identify hot spots for GR4W
- Train experts and rural communities

Implement:

- Pilot GR4W
- Scale up

GREEN ROADS FOR WATER

Connecting with (in progress):

National Programs

- Ethiopian Roads Authority
- KeRRA – Kenya Rural Roads Authority – Opening up Rural Kenya
- ANE – Administração Nacional de Estradas
- Nepal
- Bangladesh

Green Finance Initiatives

- gef – Global Environment Facility – Investing in our planet
- Green Climate Fund
- ADB – Asian Development Bank

Academia

- Mekelle University
- SEKU – Arid to Green
- WEC
- Biomedical Engineering

United Nations

- WFP – World Food Programme – wfp.org
- IFAD – International Fund for Agricultural Development

Bilateral & Multilateral Organizations

- Ministerie van Buitenlandse Zaken
- DFID – Department for International Development
- Sida – Swedish International Development Cooperation Agency
- IFDC – Developing Agriculture from the Ground Up

Private Sector foundations

- The Rockefeller Foundation
- H&M
- IKEA

Contractors

- ABB – Power and productivity for a better world™
- VolkerWessels

Main NGOs

- Helvetas
- International Federation
- JustDiggIt
- ZOA – Hulp | Hoop | Herstel