

Organic Food & Farming in the Context of Climate Change and Food, Water & Livelihood Security

Publication History

Received: 26 November 2016

Accepted: 31 December 2016

Published: January-March 2017

Citation

Robert Jordan. Organic Food & Farming in the Context of Climate Change and Food, Water & Livelihood Security. *Climate Change*, 2017, 3(9), 518-567

Organic Food & Farming in the Context of Climate Change and Food, Water & Livelihood Security

PRESENTED BY ROBERT JORDAN

**On the Occasion of the International Conference on
“Food, Water, Energy Nexus in the Arena of Climate Change”,
held from October 14 to 16, 2016,
at the Anand Agricultural University, Anand, Gujarat, India.**

Organized by Anand Agricultural University in conjunction with the National Council for Climate Change, Sustainable Development and Public Leadership (NCCSD), Ahmedabad, Gujarat, India.



National Council for Climate Change,
Sustainable Development and Public Leadership



Objective of Presentation

I want to try and show you:

that organic farming systems based on the principles of agro-ecology can be:

- **high yielding even in climate extremes,**
- **more resilient**
- **easily replicated the world over**

that they are **lower cost & very often more profitable** than chemical based farming systems,

that they can **empower farmers** by securing household food supply & **improve livelihoods** by **providing pathways to higher value markets** that reward ecological approaches, and

I want to **encourage decision-makers to access climate finance** to help fund programs that put organic practices and systems at the heart of India's adaptation, mitigation, food security, rural livelihoods and climate justice policies.

India's Agricultural & Climate Challenge



- Few countries in the world are as vulnerable to the effects of climate change as India is with its vast population that is dependent on the growth of its agrarian economy.
- Agriculture is the source of **livelihood for nearly two-thirds of the population.**
- Agriculture is **predominantly rain-fed** covering about 60% of the country's net sown area and accounts for 40% of the total food production.
- **Droughts and floods are frequent** and the sector is already facing high degree of climate variability.
- India is projected to become the most populated country by 2030 and will **need to produce an additional 100 million tonnes of food grains** to feed the large population.
- Adaptation is inevitable and an imperative for the development process and requires immediate action

Source: The Gov of India's Intended Nationally Determined Contribution (INDC) 'Working Towards Climate Justice' submitted to the UNFCCC prior to the Paris Climate Summit in 2015.



Government of India

Climate Change Policy Framework In India

- The broad policy framework on climate change is laid down by the **National Environment Policy (NEP) 2006**, but the
- **National Action Plan on Climate Change (NAPCC)** provides a sharper focus on required interventions.
- 32 States have **State Action Plans on Climate Change (SAPCC)** attempting to mainstream climate change concerns in their planning processes.
- At the international level India submitted its '**Intended Nationally Determined Contribution (INDC)**' to the UNFCCC prior to the **2015 Paris Climate Summit**.
- India's goal is to reduce overall emission intensity and improve energy efficiency of its economy over time and at the same time protecting the vulnerable sectors of economy and segments of its society.
- **Its INDC covers both mitigation and adaptation** and is primarily focused on adaptation in agriculture

Source: The Gov of India's Intended Nationally Determined Contribution (INDC) 'Working Towards Climate Justice' submitted to the UNFCCC prior to the Paris Climate Summit in 2015.

India's Key Agriculture-Related Intended Contributions to the 2015 Paris Agreement



- National Food Security Mission
- National Initiative on Climate Resilient Agriculture (NICRA)
- National Mission for Sustainable Agriculture – being revised to better integrate CC
- The National Policy for Farmers focuses on sustainable development of agriculture.
- **National Adaptation Fund** - for adaptation needs in priority sectors such as agriculture, water & forestry - in addition to sectoral spending by the respective ministries.
- **Paramparagat Krishi Vikas Yojana to promote organic farming practices**
- Soil Health Card for each farmer supported by a national network of 100 mobile soil-testing laboratories

Source: The Gov of India's Intended Nationally Determined Contribution (INDC) 'Working Towards Climate Justice'

Paramparagat Krishi Vikas Yojana to Promote Organic Farming Practices

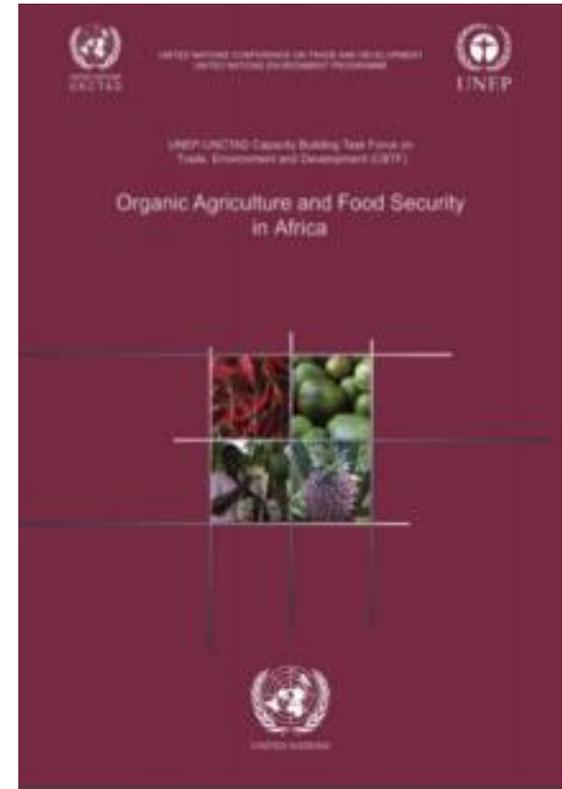


- Groups of farmers would be motivated to take up organic farming
- Fifty or more farmers will form a cluster having 50 acre land
- 10,000 clusters will be formed covering 5.0 lakh acre area under organic farming.
- There will be no liability on the farmers for expenditure on certification.
- Every farmer will be provided Rs. 20,000 per acre over three years for seed to harvesting of crops and to transport produce to the market.
- Organic farming will be promoted by using traditional resources and the organic products will be linked with the market.
- It will increase domestic production and certification of organic produce
- Rs.300 crore was allocated in the year 2015-16 to implement Paramparagat Krishi Vikas Yojana

Source: Government of India's Ministry of Agriculture Press Release Promoting Organic Farming dated 24-April-2015

Organic Agriculture: Climate resilience & Food Security for Smallholder Farmers in SSA

- UNEP & UNCTAD report shows **that training farmers in the use of basic organic practices in drought prone regions of Africa leads to average yield increases of over 100%.**
- Across 114 projects in Africa covering 2 million hectares and 1.9 million farmers *'...the average crop yield was ... 116 per cent increase for all African projects and 128 per cent increase for the projects in East Africa.'*
- They concluded that **organic agriculture can increase agricultural productivity and raise incomes with low-cost, locally available and appropriate technologies** and can be more conducive to food security in Africa than most conventional production systems.



Organic Agriculture and Food Security in Africa 2008

'Push & Pull' System of Staple Crop Production

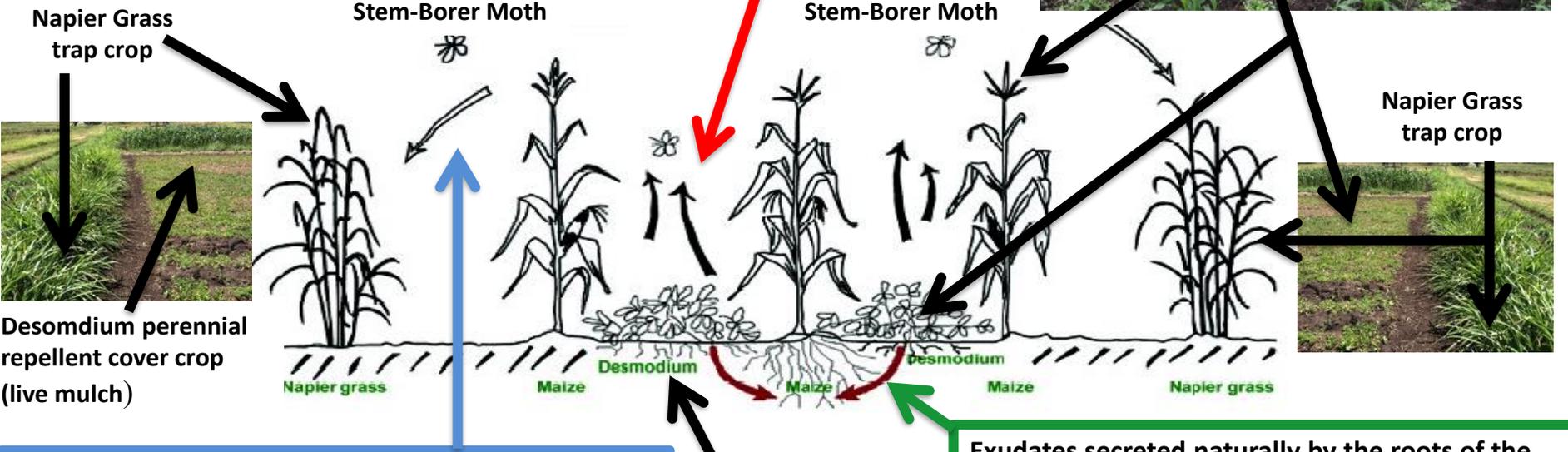
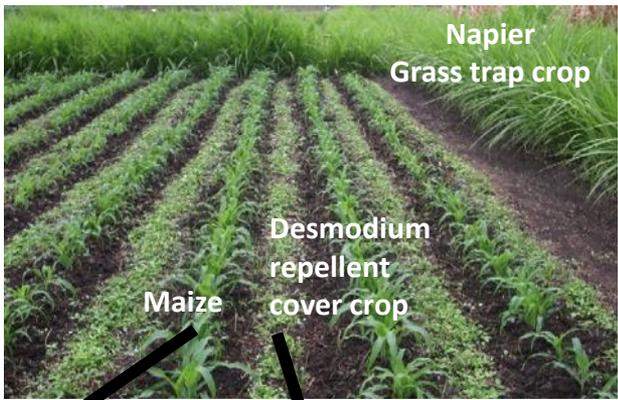
- 'Push-Pull' technology has been **developed for integrated management of stemborers, striga weed and soil fertility.**
- Push-pull was developed by scientists at the International Centre of Insect Physiology and Ecology (icipe), in Kenya and Rothamsted Research, in the United Kingdom, in collaboration with other national partners.
- The technology is appropriate and economical to the resource-poor smallholder farmers in the region as it is **based on locally available plants**, not expensive external inputs, and fits well with traditional mixed cropping systems in Africa.
- To date it has been **adopted by over 131,229 smallholder farmers in East Africa** where **maize yields have increased from about 1 t/ha to 3.5 t/ha, achieved with minimal inputs.**
- **Goal of the Push and Pull Programme: "To end hunger and poverty for 10 million people by extending Push-Pull technology to 1 million households in sub-Saharan Africa by 2020"**

Stem-Borer and Parasitic Striga-Weed - The major Causes of Staple-Crop Loss in Africa

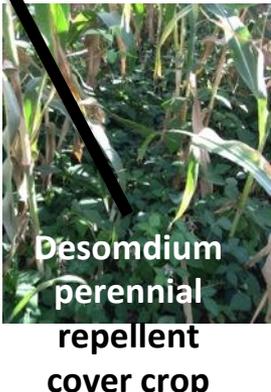
- 
- When the two pests occur together, farmers often lose their entire crop.
 - Crop losses caused by stem-borers and striga weeds amount to about US \$7 billion annually, affecting mostly the resource poor subsistence farmers.

Push & Pull System for stem borer pest and parasitic weed control in staple crops

‘PUSH’ refers to the repelling of moths by volatile phytochemicals naturally released by the desmodium perennial repellent cover crop preventing stem-borer moths laying eggs on the target crop therefore avoiding caterpillars eating the leaves & boring into the stems of the target crop contributing to severe crop loss.



‘PULL’ refers to the effect that the volatile phytochemicals naturally released by the Napier grass trap crop has on pulling stem-borer moths towards the traps so that the moths preferentially lay their eggs on the grass trap crop rather than the target crop. The caterpillars die on the spiky hairs of the grass trap crop once they hatch from the eggs.



Exudates secreted naturally by the roots of the desmodium cover crop (live mulch) into the root zone of the soil inhibits the attachment of parasitic striga weed seeds to Maize roots by causing the suicidal (early) germination of striga seeds in the soil before the roots of the crop have formed resulting in death of the germinated striga seeds. Desmodium also fixes nitrogen in the root zone, conserves soil moisture in the root zone, & improves soil organic matter.

East Africa: Companion planting for controlling striga weed and stem borer pest in Maize (push and Pull method)

1. Establish perennial Napier Grass trap crop to perimeter of crop area



2. Establish Desmodium perennial repellent cover crop (live mulch) to crop area (50m x 50m).



3. Sow Maize crop into rows in the desmodium cover crop



4. Harvest the Maize

5. Enjoy fresh Maize, store or mill into flour



9. Fertilize the soil with composted animal manure



8. Feed the animals – goats in dry area and cows in wetter areas



7. Slash the highly nutritional animal feed into easily edible pieces



6. Harvest the Napier Grass & Desmodium and store as animal feed especially for dry season



Companion Planting for Parasitic weed control in Maize

Phytochemicals (soflavones) secreted naturally by the roots of desmodium cover crop inhibit the attachment of parasitic striga weed seeds to maize roots and cause the suicidal germination of striga seeds in the soil

Result: massive maize crop fail

Result: Healthy striga-free maize crop.

Maize crop infested with parasitic striga weeds



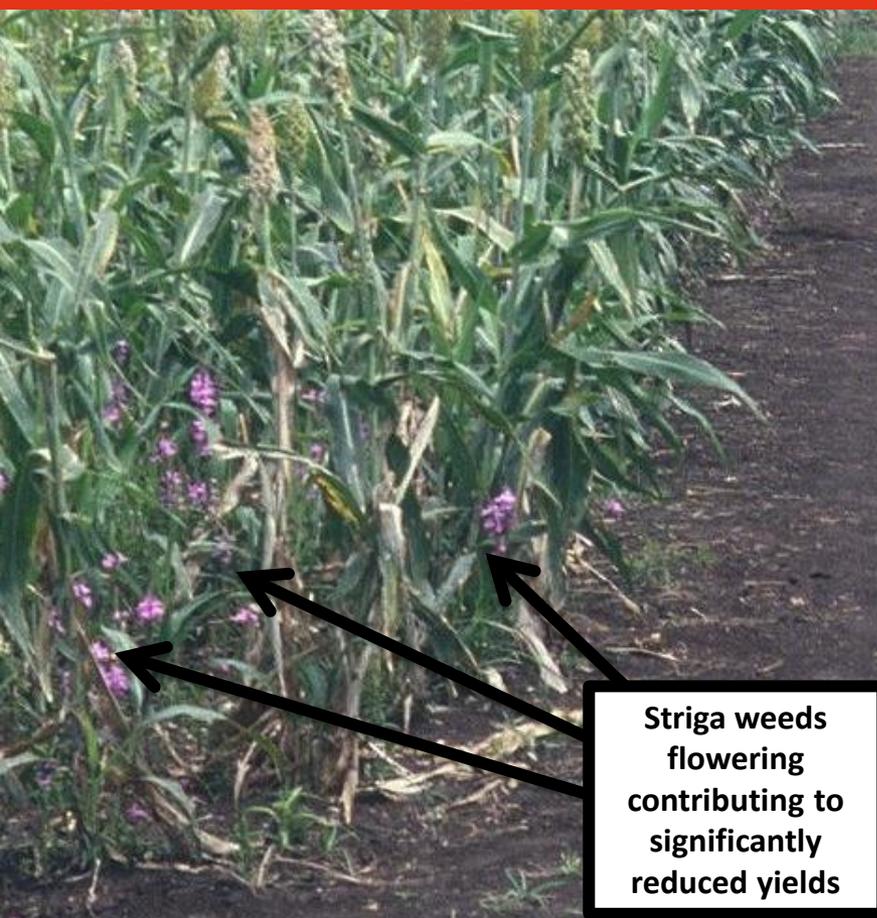
Maize with *Desmodium intortum*

Maize without *Desmodium intortum*

Sorghum Production in Ethiopia with and without Desmodium

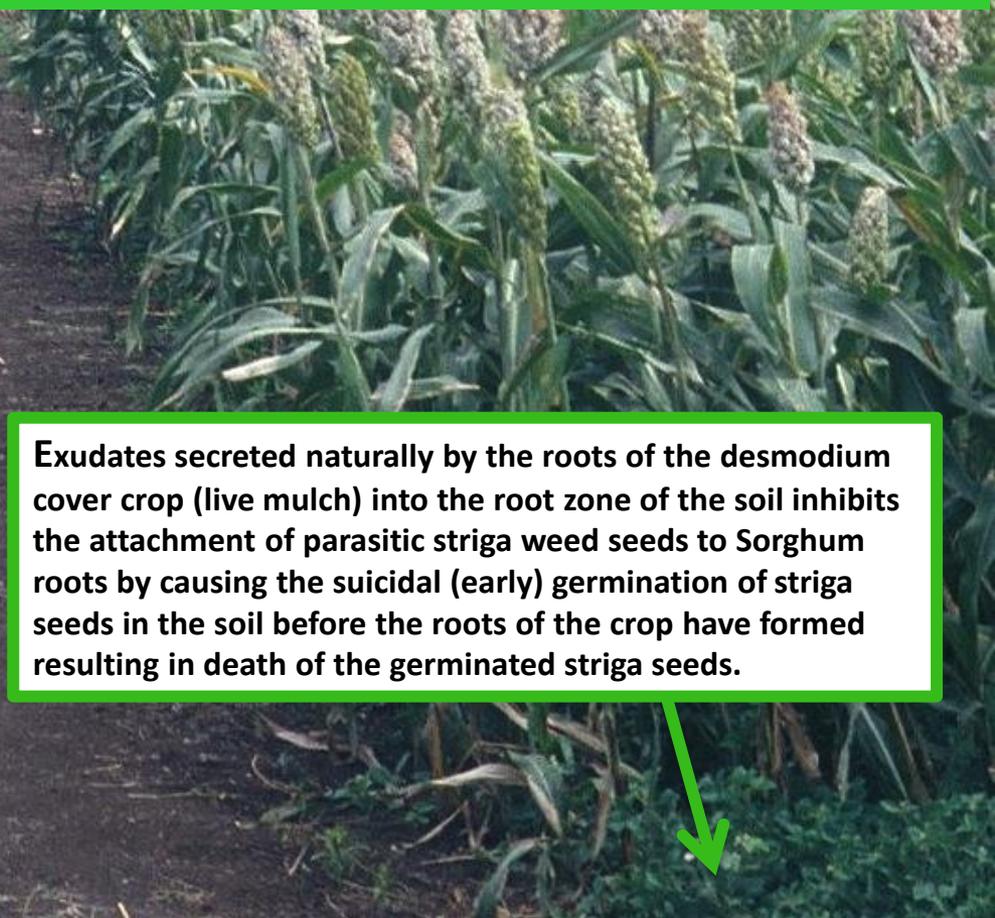
Striga infested Sorghum Mono Crop

Sorghum + *Desmodium intortum*



Striga weeds
flowering
contributing to
significantly
reduced yields

Yield: 1.4 t/ha



Exudates secreted naturally by the roots of the desmodium cover crop (live mulch) into the root zone of the soil inhibits the attachment of parasitic striga weed seeds to Sorghum roots by causing the suicidal (early) germination of striga seeds in the soil before the roots of the crop have formed resulting in death of the germinated striga seeds.

Yield: 2.6 t/ha

Farmer Comparison Trial – Maize Production (Post Harvest) in Kenya with and without Push and Pull



Maize with Desmodium & Napier Grass
(with Push & Pull)

Maize without Desmodium & Napier Grass (mono-crop)
(without Push & Pull)

Napier Grass
Trap Crop

Biological Control of Insects in Cotton Farming Systems in Egypt



- Sekem's work on using biological pheromones to control insects in their organic cotton fields led to a ban on crop dusting throughout Egypt.
- Pheromones are hormonal substances secreted by female insects, used by organic farmers to trap and eliminate male insects.
- **By 2000, the use of pesticides on Egyptian cotton fields had fallen by over 90%.**
- **Today 80% of Egypt's cotton is grown without synthetic insecticides, and average yields have risen by nearly 30%.**



System of Rice Intensification (SRI)



"SRI can raise irrigated rice yields to about double the present world average without relying on external inputs, also offering environmental and equity benefits" Norman Uphoff, Cornell University, 2003





System of Rice Intensification (SRI)

More production on the same land, but based on ecological processes not on agro industrial inputs and capital

1. Use young seedlings to preserve growth potential [however -- DIRECT SEEDING is becoming an option]
 2. Avoid trauma to the roots -- transplant quickly, shallow, no inversion of root tips that will slow growth
 3. Give plants wider spacing – one plant per hill and in square pattern to achieve 'edge effect'
 4. Keep paddy soil moist but unflooded – mostly aerobic -- not continuously saturated, then
 5. Actively aerate the soil -- as often as possible
 6. Enhance soil organic matter as much as possible
- Practices 1-3 stimulate plant growth; while practices 4-6 enhance the growth and health of roots and soil biota

- Seedlings are planted singly and spaced optimally to permit more growth of roots and canopy and to keep all leaves photo-synthetically active.
- Rice field soils are kept moist rather than continuously saturated, minimizing anaerobic conditions - this improves root growth and supports the growth and diversity of aerobic soil organisms.



Globally: System of Rice Intensification (SRI)



Cuba: Two plants, same variety (VN 2084) and same age (52 DAP)



Indonesia, Lombok Province: Rice plants of same variety and same age



Cambodia, Takeo Province: rice plant grown from single seed, with SRI methods and trad. variety



India: Punjabi farmer showing difference in rice phenotypes

Organic Low / No Till Conservation Farming in the USA – without herbicides & GMOs



- A dense, uniform cover crop is needed to create a mulch capable of suppressing weeds to avoid or greatly reduce the need for additional weed control throughout the season.
- A front-mounted, Cover-Crop Roller allows farmers to knock down a weed-suppressing cover-crop mat and plant through it all in one operation.
- No-till cover crops supply nutrients, build organic matter, prevent soil erosion and avoid herbicide & GMO use.

Organic Cover Crop Vegetable Production Systems in the USA – without herbicides

- Cover crops are killed mechanically by mowing or rolling
- The mulch can suppress weeds for 6 weeks or more. During this time, tomatoes, broccoli or other vegetables can be transplanted and established so that later-emerging weeds have little impact on yield.
- Enables greater cover crop biomass production (since it is allowed to grow until a week or so before vegetable planting)
- **Cover crops suppress weeds, curbs weed seed germination, adds organic matter and nitrogen, mobilizes nutrients, conserves and improves the soil, and provides habitat for ground-dwelling predators of insect pests.**

“Cover crop systems are limited only by your imagination” Dr. Ron Morse, a professor of horticulture at Virginia Tech, in Blacksburg, Va., designs herbicide-free soil-conserving systems for organic vegetable production in Appalachia. Using high-biomass cover crop mixtures like winter rye and hairy vetch killed to form an *in-situ* mulch, he has helped growers save tons of soil and reduce weed control costs.

Checking no-till direct-drilled corn seed placement in rolled hairy vetch





Inter-cropping pineapple with velvet bean cover crop and tropical fruit trees



Organic cotton field inter-planted with sunflower, hemp, okra & sorghum



**Pasture Cropping:
Onions in rye-grass in Australia**

Compost & Drip Irrigation Based Land Reclamation for Organic Production in Egypt

... and after 18 months



Planting with Space in Ethiopia – adapting SRI principles for other grain crops

An adaptation of SRI, by growing in rows either from transplanting seedlings or direct sowing, gives **increased yields** with easier and timely management of weeds, pests and easier harvesting.



Planting with Space in Ethiopia – Increasing the Tillering Potential of Tef

- Finger Millet and Tef, **seed rate reduced by 90%** compared to broadcasting, hence more efficient use of seed resources
- **Grain and straw yields** doubled, i.e. for Finger Millet from 1.4 t/ha to 3 t/ha grain, and for Tef from 1.2 t/ha to 2.5 t/ha or more of grain due to root growth greatly increased giving many more productive tillers (**greater root mass = greater shoot mass**)
- Tef is the highest value cereal on the market (85 USD/t), compared to maize, (25 USD/t)



Increasing Durum Wheat Yields: Planting with Space + Compost in Ethiopia

Ear with 39 grains without space or compost



Ear with 56 grains with space and compost



Activating Natural Disease Resistance: Wheat Production + Compost in Ethiopia



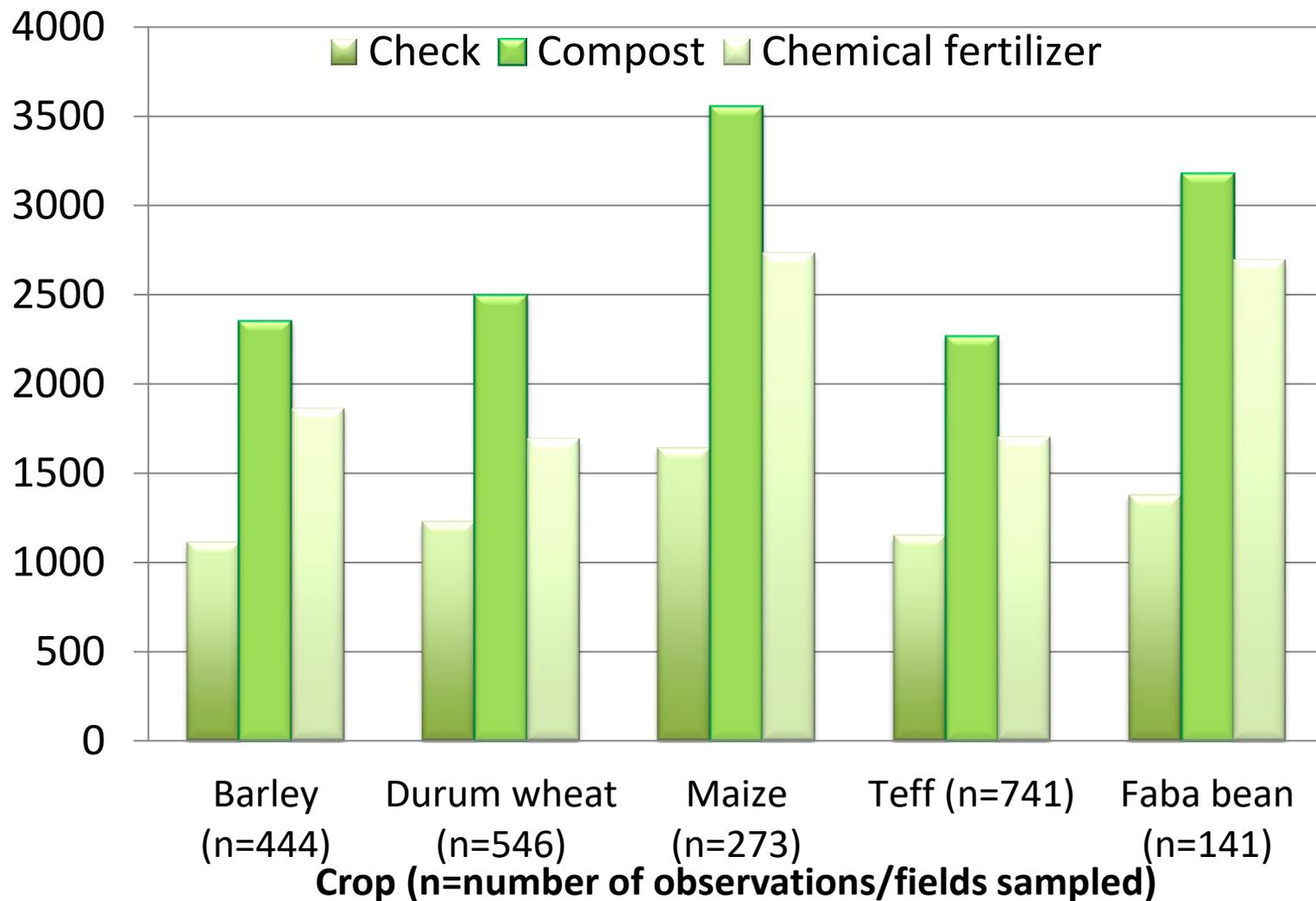
Wheat grown on composted soil resisting stripe rust – gave yield of over 6.5 t/ha



Wheat infested with stripe rust and sprayed with fungicide – gave yield of 1.6 t/ha

Compost vs Chemical Fertilizer Based Production of Staple Crops in Ethiopia

Grain yield (KG / Ha) of 5 staple crops from farmers (2000 to 2006) based on samples from 900 plots

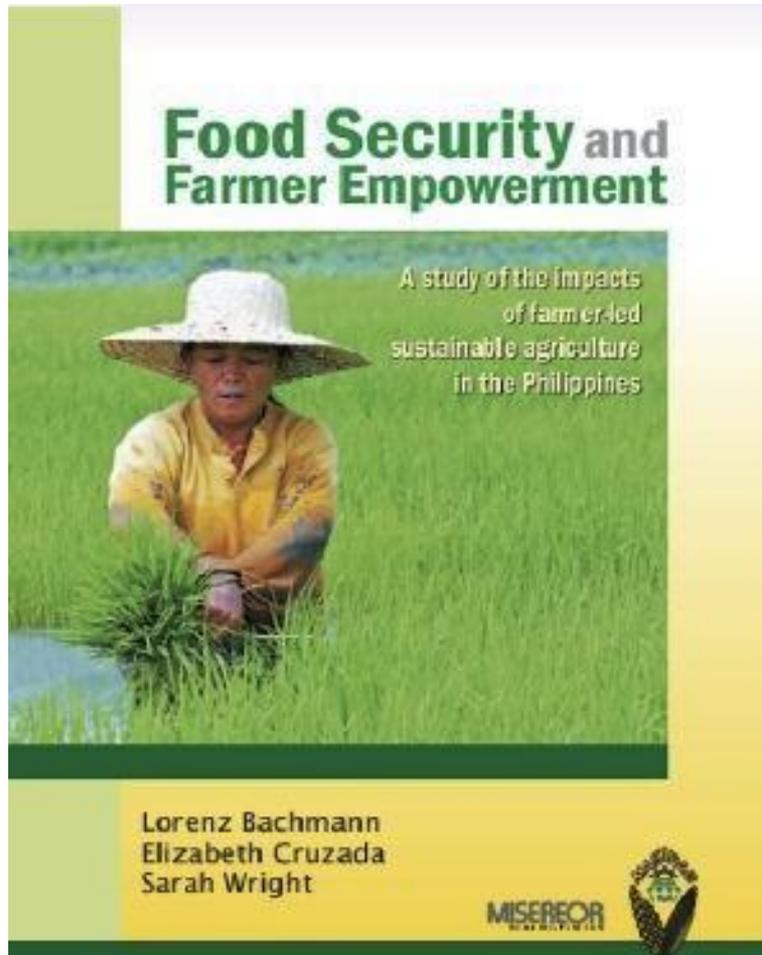


Cost Benefit of Using Compost vs Chemical Fertilizer in the Production of Durum Wheat in Ethiopia

COMPOST	CHEMICAL FERTILIZER
Average rate of compost application, 6.5 t/ha . Opportunity cost for making compost estimated at USD 390 for 6.5 t/ha	Cost for chemical fertilizer in 2012 was USD 130 per 100 kg
Average yield of durum wheat grown with compost 2500 kg/ha*	Average yield of durum wheat grown with chemical fertilizer 1700 kg/ha*
Market price of USD 50 per 100 kg , farmers income would be USD 1,250	Market price of USD 50 per 100 kg , farmers income would be USD 850
Net profit would be USD 1,250 or USD 860 if the farmer had to purchase the compost	Net profit after repaying credit, USD 720

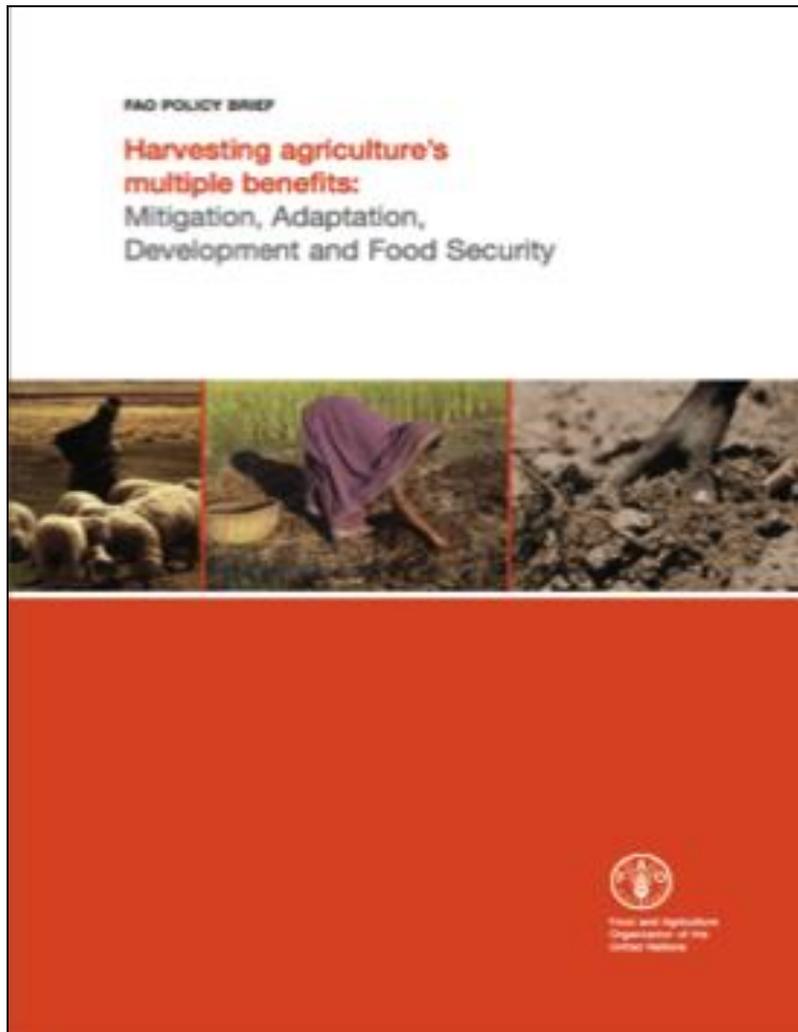
- Farmers **avoid debt** from getting chemical fertilizer on credit – now costing USD 130 per 100 kg
- Farmers making bio-slurry compost can sell one 100kg sack at approx. USD 6
- Farmers can make 35 to 100 sacks per year
- * Traditional farmer bred varieties often respond better to compost than chemical fertilizer

Rice-Based Farming Systems: Organic Smallholders in the Philippines Have Better Livelihoods.



- This book contains the results of **one of the largest studies ever undertaken on farmer-led organic rice-based agricultural systems or even on sustainable agriculture in Asia.**
- Incorporates the **experiences of 840 organic and conventional farmers** located throughout the Philippines.
- Livelihood was calculated as the **gross agricultural income minus all production costs plus the value of food eaten by the farm family** based on farm gate prices
- **The income of organic farmers after subsistence was taken into account was 27% higher than for conventional farmers.**

Climate Resilience: Soil Organic Matter



**FAO Policy brief: Harvesting
Agriculture's Multiple Benefits:
Mitigation, Adaptation, Development
& Food Security**

FAO states that “Organic and conservation agriculture, captures carbon from the atmosphere and store it in agricultural soils. This increases fertility, water retention and the structure of soils, leading to better yields and greater resilience.”

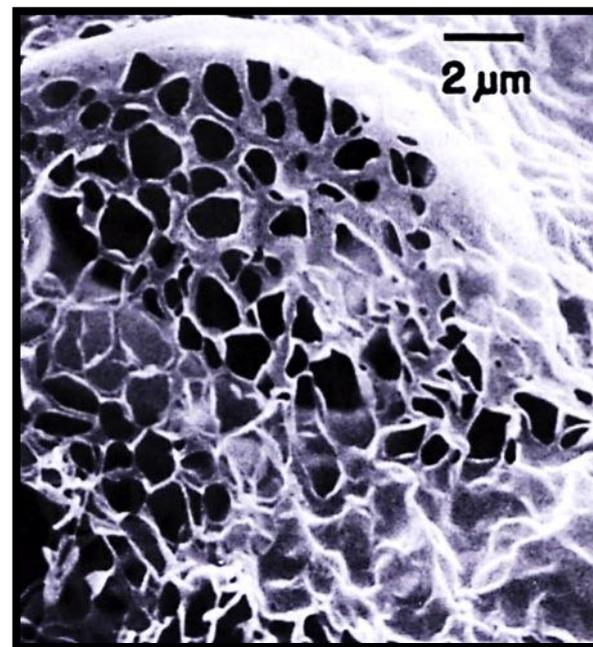
Practices such as cover crops, inter-cropping & composting actively incorporate carbon into the soil

Climate Resilience: Soil Organic Matter (SOM) Protects Against Climate Extremes (e.g. Droughts & Floods)

- SOM holds up to 30X its weight in water
- SOM cements soil particles and reduces soil erosion
- SOM increases nutrient storage & availability
- SOM improves infiltration, retention, and delivery to plants helps avoid drought damage

Volume of Water Retained /ha (to 30 cm depth) in relation to soil organic matter (OM):

- 0.5% OM = 80,000 litres (common conventional level)
- 1 % OM = 160,000 litres (common conventional level)
- 2 % OM = 320,000 litres
- 3 % OM = 480,000 litres
- 4 % OM = 640,000 litres
- 5 % OM = 800,000 litres



Electron micrograph of soil humus

Climate Resilience: Benefits of Using Compost in Ethiopia

- Crop yields doubled
- Water-holding capacity of soil increased
- Crops survive dry gaps and stay green for 2 weeks longer than others at the end of rains
- Water tables raised
- Springs reappear, persist and streams run for longer through the year
- 2 growing seasons possible
- Farmers avoid credit / debt for chemical fertilizers and make more profit per hectare / tonne.

Climate Resilience: Long-Term Organic vs Conventional Comparative Farm System Trials in Switzerland & USA

Soil Organic Matter Protects Against Droughts & Floods

Scientific Review by Cornell University (Pimentel, 2005) into the Rodale 22-year long comparative field study:

- The organic land was able to generate **yields equal to or greater than the conventional** crops after 5 years.
- The average corn yields of the two **organic systems during the drought years were 28% to 34% higher** respectively due to greater water holding capacity especially in root zone where it is most needed.

Organic Corn during the 1995 Drought



Conventional

Organic





Climate Resilience: System of Rice Intensification (SRI)

• Little or no LODGING

• Less effect of extreme temperatures

WHY? Larger, stronger root systems and possibly because more uptake of silicon when paddy soils are not kept saturated

SRI Saving of Irrigation Water in Punjab

Method of cultivation	No. of irrigations per acre	Time to irrigate one acre (4" delivery pipe)	Saving of water under SRI
Conventional methods	25	4 hours	50-55 %
SRI	13	2 hours	

❖ If we apply SRI method of cultivation on 26 lakh hectares of rice area in Punjab, then it is estimated that 50% of water can be saved.

Dr. Amrik Singh, MANAGE, Gurdaspur



Farmer Field School rice fields at Dong Tru, Hanoi Province, Vietnam after typhoon: 'normal' rice field on right; SRI practices in middle and on left

Organic Agriculture Practices Enable High Soil Carbon Sequestration

- **Average soil carbon sequestration**
The global average soil carbon sequestration rate of organic agriculture according to a peer reviewed meta analysis study is 2,000 Kg of CO₂ per hectare per year
- **On average organic agriculture sequesters 560kg / C / ha / year more in temperate regions and approx 1000kg more C / ha / year in tropical areas than conventional agriculture.**

Compost & Drip Irrigation Based Land Reclamation for Organic Production in Egypt

Sekem has sequestered on average 3.3 Tonnes of CO₂ per hectare per year for 30 years*.

Based on these figures, the adoption of Sekem's practices globally has the potential to sequester 16 Gt of CO₂ - equivalent to 30% of the world's current greenhouse gas emissions!

***Luske and van der Kamp, 2009; Koopmans et al, 2011**

Soil Carbon Sequestration: The Key to Smallholder Climate Resilience & Food Security?

- The global average soil carbon sequestration rate of organic agriculture according to a peer reviewed meta analysis study is **2,000 Kg of CO₂ per hectare per year**.
- According to the IPCC **74% of the technical mitigation potential of agriculture lies in developing countries** and soil carbon sequestration accounts for an estimated **90% of all the technical mitigation potential** of global agriculture.
- FAO state that countries or regions with large food insecure populations also tend to have large “carbon-gaps,” which result in low-yield production, food insecurity and increased climate vulnerability
- UN studies show that training farmers in the use of low cost, **organic practices in drought prone regions of Africa lead to average yield increases of over 100%**.
- By helping their farmers adopt **organic practices in return for climate finance** developing countries can significantly help close the hunger, resilience and mitigation gaps.

Participatory Guarantee Systems (PGS)

- PGSs are locally focused quality assurance systems.
- PGS provides a credible guarantee for consumers
- Certification of producers is carried out by other PGS stakeholders such as farmers & consumers – avoiding the costs of third-party certification.
- Enables access to organic markets including the development of local markets from scratch
- PGS programs are suited to small-farmers and direct markets – PGS brings many farmers that wouldn't have considered third-party certification into a system of committed organic production.

Participatory Guarantee Systems (PGS) – Global



Participatory Guarantee Systems (PGS) – Well Established Groups in India



Last Forest Enterprises is a marketing initiative of Keystone Foundation based in Tamil Nadu – it aims to spread the message of:

- small indigenous farmers and gatherers
- value added organic produce
- biodiversity and food security
- indigenous knowledge, traditions and crafts
- sustainable harvesting & farming methods
- local employment & markets
- fair trade principles



Last Forest also promotes products from other areas in the country, with similar values. It runs a chain of 3 stores in Tamil Nadu. It procures produce from over 60 PGS groups across the country and supplies to over 40 retailers.



Participatory Guarantee Systems (PGS)



- The PGS model could be an ideal tool for branding the clusters of farmers currently being established under the Gov of India's cluster-based organic farming promotion programme (Paramparagat Krishi Vikas Yojana' - PKVY).
- PGS systems could be used by each cluster to provide low-cost and therefore financially sustainable organic guarantees to their local, regional and even national customers.

Climate Finance: Green Climate Fund



- GCF is the major fund of the UNFCCC
- **GCF aims to mobilize \$100 billion of funding by 2020 to invest in low-emission and climate-resilient development in developing countries.**
- GCF is open to any nationally accredited agencies.
- The fund currently has \$10 billion.
- GCF governance structure that ensures consensus-based decisions between 12 developed & 12 developing countries.
- GCF aims for a 50:50 balance between mitigation and adaptation investments over time.
- GCF became operational in 2015
- Each developing country which is a Party to the Convention must appoint a Nationally Designated Authority (NDA) to act as an interface with the GCF
- NDA endorses projects via the provision of No-Objection-Letters (NOLs).

Green Climate Fund: Priority Areas



The Fund has 4 impact areas for delivering major mitigation and adaptation benefits that are related to agriculture:

- Sustainable land use and forest management
- Enhanced livelihoods of the most vulnerable people, communities, and regions
- Increased health and well-being, and food and water security
- Resilient ecosystems

Accredited entities (AE) may submit a concept note for feedback and recommendations from the Fund, in consultation with the National Designated Authority or Focal Point at any time.

Green Climate Fund: Criteria for Programme and Project Funding



Project Criteria	Definition
1. Impact/result potential	<ul style="list-style-type: none"> • Reduced emissions from sustainable land use management • Cost-effectiveness
<p>ATTENTION!</p> <p>The Green Climate Fund is <u>Desperate</u> for High Quality Proposals to Fund – The Gov of India Could Develop a Concept Note for an Organic Based Smallholder Livelihood & Climate Resilience Project or Programme with Development Partners aligned with its’ priorities set-out in its’ INDC.</p>	
	<ul style="list-style-type: none"> • Total financing mobilized per USD of GCF financing provided / impact per US dollar delivered by the Fund / Amount of co-financing • Cost-effectiveness
6. Financial viability (for revenue-generating activities)	<ul style="list-style-type: none"> • Financial rate of return / Financial soundness of activity

Summary of key points

- OA uses locally available, affordable natural resources adapted to the local region rather than costly external inputs
- OA can double yields of subsistence farms especially in harsh climatic and degraded regions
- OA is more resilient to climate change (e.g. drought & floods)
- OA is highly suitable for smallholder (rural and urban) farmers
- OA enables food to be grown where hungry people live and creates economic opportunities without much capital or risk of debt and develops local economies.
- OA is knowledge and people intensive rather than capital intensive – it builds the resilience of the actual farm rather than outsourcing resilience to costly external inputs
- OA is people-centred – it puts people and the community at the centre of the food and farming system through participatory processes – including PGS

Recommendations

- The PGS model could be an ideal tool **for branding the clusters of farmers currently being established under the Gov of India's cluster-based organic farming promotion programme** (Paramparagat Krishi Vikas Yojana' - PKVY) providing them with a low-cost organic guarantee system for their local customers & markets.
- The clusters established by **PKVY could act as a base from which other projects could be 'piggy-backed'**
- The Green Climate Fund is Desperate for High Quality Proposals to Fund – **The Government of India Could Develop a Concept Note for an Organic Based Smallholder Livelihood & Climate Resilience Project or Programme with Development Partners aligned with its' priorities set-out in its' INDC.**
- The INR 3,500 million (USD 55.6 million) funds in the new Indian National Adaptation Fund to leverage more funds from development partners and the GCF.

19th IFOAM
Organic World Congress (OWC)

जैविक कृषि विश्व कुंभ

9 – 11 November 2017

India Expo Centre and Mart, Greater Noida, India



"An Organic World through an Organic India"

जैविक भारत के माध्यम से जैविक विश्व

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ॐ द्यौः शान्तिरन्तरिक्षं शान्तिः
पृथिवी शान्तिरापः शान्तिरोषधयः शान्तिः ।

“Om dyauh śāntir antariksam śāntih prithvi śāntih āpah śāntih osadhayah śāntih”

-- Yajur Veda 36.17

**{{Unto Heaven be Peace, Unto the Sky and the Earth be Peace, Peace be unto the
Water, Unto the Herbs and Trees be Peace}}**



Government of India

“When we speak only of climate change, there is a perception of our desire to secure the comforts of our lifestyle. When we speak of climate justice, we demonstrate our sensitivity and resolve to secure the future of the poor from the perils of natural disasters”.

Prime Minister Narendra Modi
while addressing the United Nations
on the 25th September 2015.