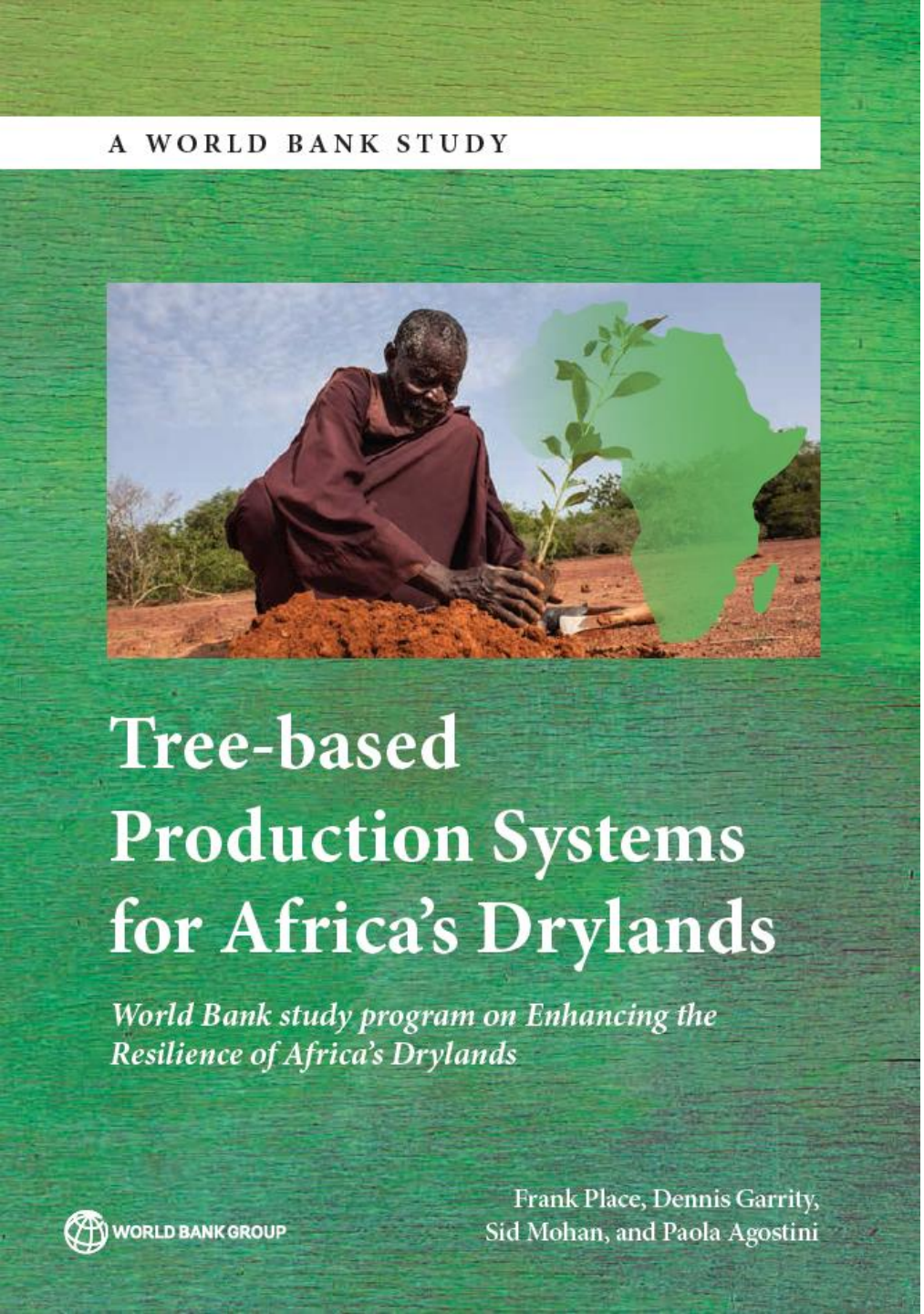


First Conference of the Great Green Wall for the Sahara and the Sahel Initiative

Technical session:
Confronting Drought in Africa's Drylands: Opportunities for Enhancing Resilience

Dakar, Senegal
May 4, 2016

Key question:

What is the potential for tree-based interventions to increase resilience of populations living in the drylands?

Challenges

Lack of water is the main impediment to planting trees in the drylands, making it necessary to rely on natural regeneration of native trees

Natural regeneration is hampered by **institutional and policy constraints**, including (i) inappropriate forest regulations, (ii) uncontrolled grazing practices, and (iii) lack of awareness of the benefits that can be realized by associating trees and shrubs with crops and livestock

Analytical approach

- Reviewed the literature (which is scant for some tree based interventions and locations)
- Developed and applied a multiyear cost-benefit framework to analyze different tree based interventions
- Examined production possibilities and value chain enhancement opportunities
- Examined opportunities and challenges across different aridity and market contexts

Main contributions of trees to resilience

- Trees provide vegetative cover that protects soils, reduces ground and soil temperatures, and improves water infiltration – they support other natural resources
- Trees provide soil nutrients for crops and fodder for livestock – they add resilience to other farming systems
- Trees provide many products for human consumption, including fruits, nuts, fuelwood, timber and medicines – they diversify production and income sources
- Trees are assets that can be harvested in times of need – they provide for coping strategies

Opportunities

Practices that generate multiple products and services

- Farmer managed natural regeneration
- Exclosures for degraded land and rangelands

Practices that focus on production of non-wood products

- Shea, gum Arabic, cashew, nere, various fruits, honey
- Tree and shrub fodders

Practices that focus on production of wood products

- Timber/poles (e.g., through woodlots or boundary planting)
- Firewood/energy

Practices that focus on natural resource services

- Soil fertility (rotating or intercropping trees and crops)

Farmer Managed Natural Regeneration

In drylands, regeneration often accounts for 90% of standing trees (on farms and off farms)

Regeneration leads to many different mixes and densities of trees across the African drylands

Planting of trees is mainly undertaken for species that can provide income, which tends toward fruit, nut, pole/timber trees, in locations nearer to major markets and in drylands where water is more available

In the foreseeable future, farmer managed natural regeneration will continue to be a foundational practice for all of the drylands

Farmer Managed Natural Regeneration - Benefits

Country	Value of harvested tree products per household (USD)	Value of marketed tree products per household (USD)	Households with sales of tree products (%)
	Mean	Mean	%
Burkina Faso	181	64	45
Mali	254	73	51
Niger	267	12	18
Senegal	119	37	48

Note: Mature indigenous 'fertilizer trees' have a larger effect on yields (15-30%) than manure or fertilizer, and farmers tend to apply more manure and fertilizer on fields where the mature fertilizer trees are present.

Source: Place and Binam 2013

Mangifera indica - Mango

Mango production in **Kenya** has increased significantly between 2005 and 2010 (more than 100% according to Government of Kenya statistics).

Exports increased from $3.8 million in 2003 to almost $14 million in 2013 (still less than 5% of total production)

In full production, the net profit per hectare is about $500, which is high compared to most annual crops

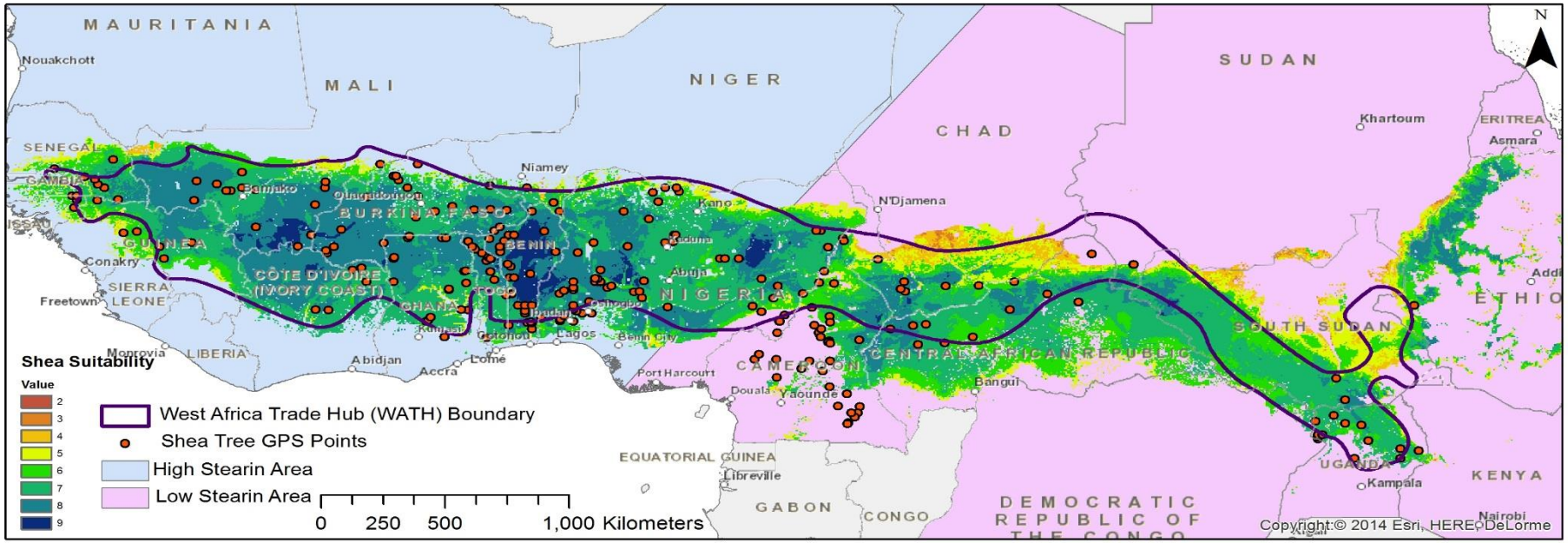
Mali has grown its exports of mangoes from 1,500 tons in late 1990s to more than 5,000 tons in 2013

Vitellaria paradoxa - Shea

Production of almost 1 million tons, exports of more than 350,000 tons (at value of $300 – $500 per ton)

Much of the shea crop is used domestically (fruit and kernel for food)

More than 1 million women involved in the value chain in northern Ghana and Burkina Faso



Source: McNaughton and Lovett (2015)

Timber and charcoal production

Drylands produce much of the firewood and charcoal used for local and urban consumption

By 2030, the charcoal market is predicted to exceed US$ 12 billion, employing 12 million people

Timber opportunities are being met in certain dryland regions through planting of appropriate species (e.g., *Acacia mearnsii* or *Melia volkensis*)

Source: McNaughton and Lovett (2015)

Policy recommendations

1. **Build knowledge at policy and extension level about different ways that trees can be integrated into farming systems**

Change attitudes/mindsets regarding the integration of trees in agriculture:

- disseminate evidence of benefits
- train public extension agents and program leaders
- Sensitize policy makers

Policy recommendations

2. Manage grazing practices and use of fires, which affect all types of tree investments in the drylands

Improve local landscape management – through strengthened local institutions and cost-sharing for protection of trees

Allowing young trees to survive benefits livestock keepers as well

Source: CIRAD 2012

Policy recommendations

3. **Revise forest regulations to remove disincentives for farmers to retain valuable indigenous trees and rejuvenate the parklands**

Regulations to protect indigenous species often have the opposite effect on farms and need to be smarter

License fees currently being charged by forestry departments should be replaced by rewards for investing in increased tree cover (e.g., from carbon payments)

Policy recommendations

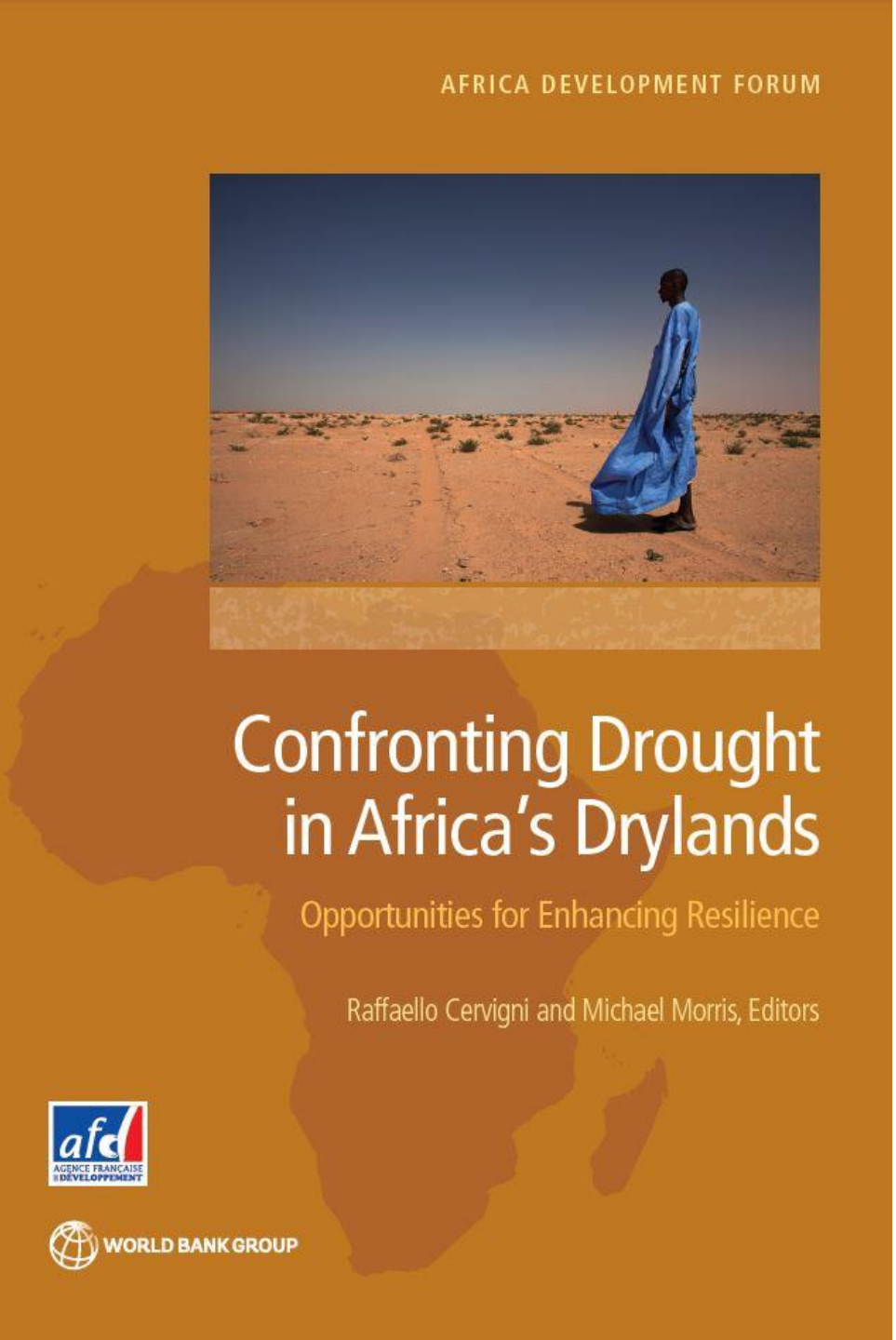
4. **Develop markets for tree products to increase value of trees to farmers (marketing barriers include low volumes, lack of attention to quality, high handling and transport costs, excessive regulations)**

- Improve market information system for tree products
- Improve infrastructure to reduce post-harvest losses and reduce handling and transport costs
- Invest in domestic processing where appropriate (e.g., fruit, cashew, shea, timber).

Policy recommendations

5. Promote germplasm multiplication and distribution for high value tree species

- Enable flow of superior germplasm across borders where necessary
- Invest in training on seed collection and nursery techniques
- Provide quality control function over germplasm supply sector



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