

SAFE-World Project/Initiative Summary

Country: Benin

Project/Initiative Title: Adoption of Mucuna in southern Benin
1994

Scale: Individual farm / many communities Nos. farmers: 14,000 Hectares: 11,000

Agro-Ecological Zone: III

Improvement types

1x	2	3 x	4	5	6x	7	8 x	9
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Success and Limits to spread

Success	Limits
1a, 3e	2a, 3a

A. Key Impacts

A1 – Productivity

	Before/Without	After/With	% change
Maize Crop 2	930 kg/ha	1210 kg/ha	30
Animal 1			
Animal 2			

A2 – Impacts on natural capital

- Reclamation of degraded land (continuous cropping for 8 years instead of 3 years followed by fallow)
- Reduction in the frequency of weeding (i.e. labor saving) from 4 to 2 for one cropping season
- Reduction of soil erosion (not quantified)

A3 – Impacts on local community (social capital)

The uptake of the technology is individual. However there are informal exchanges of both seed and experience among farmers.

A4 – Impacts on households and individuals (human capital)

- Farmer experimentation on cover crops
- Increase income at farmer level, therefore better nutritional status for children

A5 – Key changes in farm system

Changes in input use:

Savings of imports of chemical fertilizer: about 3000 metric tons amounting to about CFA Franc 525 million or \$0.9 million at a moderate rate of adoption of 7%

Change in local/ regional food security:

Surpluses in production for 1995 and 1996 are equivalent to 1997 imports on maize of 4,800 metric tons, i.e., savings of about 600m. CFA franc or \$1million

First-year adopters received a in-kind credit of Mucuna seed from NGOs.

B. Types of Sustainable Agriculture Improvements

Type 1: Better use of available renewable natural capital

Type 2: Intensification of single sub -component of farm system

Type 3: Diversify by adding new productive natural capital and regenerative components

Type 4: Better use of non-renewable inputs and technologies

Type 5: Social and participatory processes leading to group action for making better use of natural capital

Type 6: Human capital building through training-learning programmes

Type 7: Access to Finance

Type 8: Add value by processing to reduce losses and increase returns

Type 9: Add value by direct or organised marketing of produce to consumers

	Yes/No	Narrative
Type 1	x	<ul style="list-style-type: none">- Reclamation of degraded land (continuous cropping for 8 years instead of 3 years followed by fallow)- Reduction of soil erosion (not quantified)
Type 2		
Type 3	x	Leguminous cover crop. (i.e. Mucuna planted fallow)
Type 4		
Type 5		
Type 6	x	Surveys of farmers using participatory methods, focus group discussions, and field observations. <ul style="list-style-type: none">- Collaboration with NARIs, ONGs, and extension services
Type 7		
Type 8	x	<ul style="list-style-type: none">- Processing of nonedible grains into safe, high quality protein products for human consumption- Processing of nonedible grains as animal feed for pig production
Type 9		

C. Key Lessons: Success, Spread and Constraints

C1 – Key Lessons Learned

- A technology that was developed in a participatory mode with farmers is easily adopted
- A technology that is socially adapted to farmers circumstances is easily accepted by

them

C2 – Aspects of local/national context contributing to success

- ?? Collaboration between farmers-researchers-extension agents (NGOs)
- ?? NGOs major role in the dissemination of the technology

C3 – Limitations preventing spread

- Local land tenure customary rules constrain adoption by land shortage farmers, in particular women
- Weak official extension services

C4 – Policy issues

- ?? Insecure land tenure does not encourage vulnerable groups to adopt
- ?? Weak extension services do not facilitate a quick spread of the technology
- ?? Policy makers are not sensitised to the use of the technology
- ?? Removal of subsidies on chemical fertilizers and other distortions in the macro-economy would increase the competitiveness of agroforestry-based technologies such as the Mucuna planted fallow

D. Contact Point for Project/Initiative

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E. Project Narrative

Mucuna (velvetbean) cover cropping in Benin

The spread of mucuna (*Mucuna pruriens*) for suppression of the aggressive weed *Imperata cylindrica* has occurred because of land scarcity, decline in soil fertility, lack of fertilizer, and weed encroachment. Researchers introduced mucuna cover cropping to alleviate the constraint of low nutrient supply to maize, the staple crop. The government extension services (CARDER) became interested in this success and started testing the system. In 1990, the CARDER for Mono Province tested the system in 12 villages with 180 farmers. They expanded to other southern provinces in 1991, with the number of farmers growing to some 500. Large NGOs then became involved and the estimated number of farmers testing mucuna grew to nearly 100,000 in 1996 throughout Benin.

Farmers who adopt mucuna cover cropping benefit from higher yields of maize with less labour input for weeding: maize following mucuna yields 3-4 t/ha without application of nitrogen fertilizer (similar to yields normally obtained with recommended levels of fertilization at 130 kg N/ha); whilst yields on plots previously planted with maize and cowpea was 1.3 t/ha. The benefit:cost analysis over a period of 8 years indicated a ratio of 1.24 when mucuna was included in the system, and 0.62 for the system without mucuna. The ratio was 3.56 if mucuna seeds were sold.

Benin: Mucuna (velvetbean) cover cropping

This is an example of the introduction of a simple regenerative component into farm systems combined with increasing farmers' capacity for local-adaptation of the technology. The spread of mucuna (*Mucuna pruriens*) for suppression of the aggressive weed *Imperata cylindrica* has occurred because of land scarcity, decline in soil fertility, lack of fertilizer, and weed encroachment. Soils on the plateaux of southern Benin and Togo are nearing exhaustion. Fertilizer use is low among the large class of smallholder farmers. But even if fertilizers were available, the benefit from their use is declining because of a degrading soil resource base. Another consequence of the reduced fallow periods is encroachment of *Imperata*, an aggressive weed that is very difficult to eradicate by hand. Researchers with the Recherche Appliquee en Milieu Reel project introduced mucuna cover cropping to alleviate the constraint of low nutrient supply to maize, the staple crop.

The government extension services (Centre d'Action Regional pour le Developpement Rural - CARDER) became interested in this success and started testing the system. In 1990, the CARDER for Mono Province tested the system in 12 villages with 180 farmers. They expanded to other southern provinces in 1991 and the number of farmers testing mucuna grew to approximately 500. Large NGOs became involved and some 14,000 farmers now growing mucuna throughout Benin.

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The benefit:cost analysis over a period of 8 years indicated a ratio of 1.24 when mucuna was included in the system, and 0.62 for the system without mucuna. The ratio was as high as 3.56 if mucuna seeds were sold. However, yearly analysis of the benefit: cost ratio indicated a declining trend over time for all systems suggesting that addition of external inputs (probably P and K fertilizer) are required in order to achieve full sustainability. Adoption of mucuna throughout the Mono Province would result in savings of about 6.5 million kg of nitrogen or about US \$1.85 million/year.

Source: Bob Carsky, Victor Manyong