No-till field day in Benahmed region. The sign says: Trial with barley, direct seeding

Applied research and knowledge transfer (Morocco)

DESCRIPTION

Innovative, cross-disciplinary community-based approach for development and transfer of no-till technology at the farm level.

Aims / objectives: After 15 years of on-station research at the National Institute of Agricultural Research (INRA), testing and evaluation of no-till technology (NTT) at farm level started in 1997 with three pilot farmers. Recently two new projects were established to promote the introduction and adoption of NTT, in collaboration with the regional council and extension service of the Ministry of Agriculture (MoA). Fourteen pilot farmers are now involved in NTT. The overall purpose is to promote no-till technology to restore soils, improve production, mitigate drought, increase wealth and strengthen farmers??? organisations. NTT has been shown to be socially, economically and ecologically adapted to the local conditions. The approach has three stages: (1) Initiation: this includes basic research, strategic research and applied research; (2) Consolidation: planning is followed by detailed evaluation of technology adoption on farmers' fields; (3) Maturity: this involves the acceptance/spread of NTT with an increased number of farmers in the future.

Methods: INRA carries out research, information dissemination, gives training to technicians and farmers, and provides both technical assistance and monitoring. The regional council was convinced by the technology and now financially supports research activities, drill manufacture and extension of NTT. It also facilitates contacts with decision makers and farmers, and carries out evaluations. MoA development and extension services provide financial support, advice, technical assistance, and logistical support to farmers: they help to make the drills available. NGOs are engaged in the development of local/regional networks and farmers associations, as well as in funding and providing incentives. Farmers themselves are involved in the implementation, evaluation and dissemination of NTT. Participation, cross-discipline and bottom-up planning are key elements of the approach. Methods for implementation include long-term community on-farm trials, on-site training and information exchange, participation of stakeholders, information dissemination tools, and multi-directional knowledge flow. These are supplemented by intensive measurement/monitoring schemes, establishment of local/regional networks and farmers' association creation. On-the-job training is also provided.

LOCATION

Location: Chaouia/Ouardigha, Morocco

Geo-reference of selected sites

- -7.606, 32.959

Initiation date: 1997

Year of termination: n.a.

Type of Approach

- ☐ traditional/ indigenous
- ☐ recent local initiative/ innovative
- ☑ project/ programme based

No-till field day in Benahmed region. The sign says: Trial with barley, direct seeding

Barley samples from on-farm plots at Khourigba, showing improved growth under no-till technology compared with conventional farming.

APPROACH AIMS AND ENABLING ENVIRONMENT

Main aims / objectives of the approach

The Approach focused mainly on SLM with other activities

- spread the no-till technology: thereby enhancing soil productivity and reducing susceptibility to land degradation. - develop the production of no-till drill machinery. - generally: to ameliorate the living conditions of rural people through enhancing expertise, capacities and knowledge of farmers in managing their soils and crops

The SLM Approach addressed the following problems: - previous absence of an integrated research and extension programme. - lack of technical options in a harsh and risky environment. - underlying problems of land degradation and drought periods

Conditions enabling the implementation of the Technology/ ies applied under the Approach

Conditions hindering the implementation of the Technology/ ies applied under the Approach

- **Social/ cultural/ religious norms and values**: Over-reliance on traditions in soil management; attitudes of farmers towards conventional tillage need challenging through information about alternatives. Treatment through the SLM Approach: Training, video conferences, travelling workshops, etc.
- **Availability/ access to financial resources and services**: Lack of specific funds, credit, loans for investment in new machinery Treatment through the SLM Approach: Prioritise funds for no-tillage development
- **Institutional setting**: Extension service are not well incorporated in the approach due to lack of knowledge/information on no-tillage Treatment through the SLM Approach: Special Training program; change of institutional thinking upon no-tillage systems
- **Legal framework (land tenure, land and water use rights)**: lack of SWC-relatedl laws Treatment through the SLM Approach: Recommendations on laws to cover SWC technologies. The existing land ownership, land use rights / water rights moderately hindered the approach implementation small size of field requires integration of farmers for using no-till drill and other equipment
- **Knowledge about SLM, access to technical support**: Lack of adapted machinery Treatment through the SLM Approach: Promotion of no-till drill industry in Morocco

PARTICIPATION AND ROLES OF STAKEHOLDERS INVOLVED

Stakeholders involved in the Approach and their roles

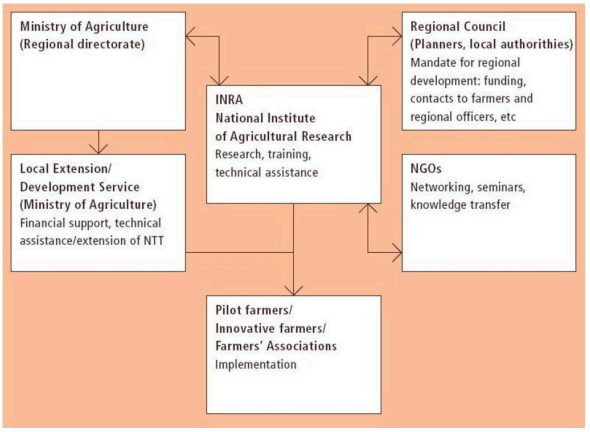
What stakeholders / implementing bodies were involved in the Approach?	Specify stakeholders	Describe roles of stakeholders
local land users/ local communities		
community-based organizations	Existing groups of land users	
SLM specialists/ agricultural advisers		
national government (planners, decision-makers)	INRA	

Involvement of local land users/ local communities in the different phases of the Approach

	none	passive	external support	interactive	self-mobilization	
initiation/ motivation		✓				Mainly:public meetings; partly: workshops/seminars; open days
planning			✓			Mainly: workshops/seminars; partly: public meetings
implementation			✓			Mainly: responsibility for minor steps; partly: casual labour
monitoring/ evaluation			✓			Mainly: interviews/questionnaires; partly: measurements/observations; field observations
Research				✓		on-farm; demonstration plots

Flow chart

Institutional framework: Stakeholders and their roles: cross-disciplinary linkages between INRA, collaborating institutions and farmers.



Decision-making on the selection of SLM Technology

Decisions were taken by
- land users alone (self-initiative)
- mainly land users, supported by SLM specialists
- all relevant actors, as part of a participatory approach
- ✓ mainly SLM specialists, following consultation with land users
- SLM specialists alone
- politicians/ leaders

Decisions were made based on
- evaluation of well-documented SLM knowledge (evidence-based decision-making)
- research findings
- personal experience and opinions (undocumented)

TECHNICAL SUPPORT, CAPACITY BUILDING, AND KNOWLEDGE MANAGEMENT

The following activities or services have been part of the approach

- ✓ Capacity building/ training
- ✓ Advisory service
- ✓ Institution strengthening (organizational development)
- ✓ Monitoring and evaluation
- ✓ Research

Capacity building/ training

Training was provided to the following stakeholders
- ✓ land users
- field staff/ advisers
- ✓ extensionists/trainers, politicians/decision makers, planners

Form of training
- ✓ on-the-job
- farmer-to-farmer
- ✓ demonstration areas
- ✓ public meetings
- courses

Subjects covered

no-tillage system, weed control, machinery, cropping systems, crop variety

Advisory service

Advisory service was provided
- ✓ on land users' fields
- at permanent centres

Key elements: Participation of extension agents and farmers / observations (on the crop, weeds, disease, seeding condition, yield components), On-job training / open days (field days to make farmers and extension discuss questions / remarks regarding no till technology, Monitoring/Participatory; 1) Advisory service was carried out through: government's existing extension system 2) Advisory service was carried out through: government's existing extension system; Extension staff: mainly government employees 3) Target groups for extension: land users; Activities: demonstration, field days, traveling workshops

Advisory service is inadequate to ensure the continuation of land conservation activities; Extension Agents need training

Institution strengthening

Institutions have been strengthened / established
- [ ] no
- [ ] yes, a little
- [x] yes, moderately
- [ ] yes, greatly

at the following level
- [x] local
- [ ] regional
- [ ] national

Describe institution, roles and responsibilities, members, etc.

Type of support
- [x] financial
- [x] capacity building/ training
- [ ] equipment

Further details

Monitoring and evaluation
Bio-physical aspects were regular monitored by 0 through measurements Technical aspects were regular monitored by 0 through measurements Socio-cultural aspects were ad hoc monitored by 0 through observations Economic / production aspects were regular monitored by 0 through measurements; Area treated aspects were ad hoc monitored by 0 through observations No. of land users involved aspects were regular monitored by 0 through measurements Management of Approach aspects were ad hoc monitored by 0 through observations; There were no changes in the Approach as a result of monitoring and evaluation: The evaluation is still in process: thus too early to state what changes are likely.

Research
Research treated the following topics
- [x] sociology
- [ ] economics / marketing
- [ ] ecology
- [x] technology
- [x] agronomy

crop performance, soil analysis, no-till drill design and evaluation, socio-economic indexes of NTT.

Research was carried out both on station and on-farm

FINANCING AND EXTERNAL MATERIAL SUPPORT

Annual budget in USD for the SLM component
- [ ] < 2,000
- [ ] 2,000-10,000
- [ ] 10,000-100,000
- [x] 100,000-1,000,000
- [ ] > 1,000,000

Precise annual budget: n.a.

Approach costs were met by the following donors: government (national - INRA/Ministry): 80.0%; local community / land user(s) (Regional Council): 20.0%

The following services or incentives have been provided to land users
- [x] Financial/ material support provided to land users
- [x] Subsidies for specific inputs
- [x] Credit
- [ ] Other incentives or instruments

Financial/ material support provided to land users

	partly financed	fully financed
equipment: machinery	☐	☑
agricultural: seeds	☐	☑
agricultural: seeds: fertilizers	☐	☑
biocides	☐	☑

Labour by land users was
- [x] voluntary
- [ ] food-for-work
- [ ] paid in cash
- [ ] rewarded with other material support

Credit
Conditions: repayment conditions: To promote the acceptance of the technology, farmers receive a 50% subsidy on the purchase price of the no-till drill (as is the general case for all types of drills)..
Credit providers: n.a.
Credit receivers: n.a.

IMPACT ANALYSIS AND CONCLUDING STATEMENTS

Impacts of the Approach

	No	Yes, little	Yes, moderately	Yes, greatly
Did the Approach help land users to implement and maintain SLM Technologies?	☐	☐	☑	☐

Better use of the rainwater stored in the soil by crops leads to improvement of soil and water management: increase in soil organic matter has multiple benefits.

Did the Approach improve issues of land tenure/ user rights that hindered implementation of SLM Technologies?
The land is a private property and can not be affected by no-tillage but with no-tillage farmers can rent or buy new lands for adoption of more no-tillage.

Did other land users / projects adopt the Approach?
This no-till system can now be considered for several different agroecological situations where a similar approach can be applied (e.g. flood control project, agro-forestry program, soil restoration project, etc.).

Main motivation of land users to implement SLM

- [x] n.a.

Sustainability of Approach activities

Can the land users sustain what hat been implemented through the Approach (without external support)?

- [ ] no
- [x] yes
- [ ] uncertain

Progress can continue to be made, assuming that training, subsidised drills, and the creation of farmers' organisations all persist.

CONCLUSIONS AND LESSONS LEARNT

Strengths: land user's view

- Adaptability to farmers needs/constraints (How to sustain/ enhance this strength: Include integration of livestock and crops. This should be helpful to pursue in the approach)
- Farmer's decisions, opinions, critics (How to sustain/ enhance this strength: Bottom-up maintained (gradually))
- Incentives make it possible for land users to experiment with a new cultivation system (How to sustain/ enhance this strength: Diversification of incentives: eg reduction in seed prices and herbicides for NTT farmers; award - NTT best producers; reduction in interest rates for NTT farmers (for credits or loans); special NTT training courses.)

Strengths: compiler’s or other key resource person’s view

- The NTT project has integrated several institutions -which is unique in Morocco. Now research, extension, community and farmers are working together towards the same objective (How to sustain/ enhance this strength: Further develop, refine and spread NTT)
- NGOs development: the association of NTT farmers and environmental clubs are important for spreading NTT and for re-enforcing the importance of NTT amongst government officers and decision makers (How to sustain/ enhance this strength: special NGOs should be encouraged to respect soils, nature, environment)
- Cross-discipline: involving land users, research and extension agents has helped in building up an approach suitable for the local conditions. (How to sustain/ enhance this strength: The working teams received also incentives and recognictions)
- research connected to extension (How to sustain/ enhance this strength: research should be developed to get continuous measurements/information and to search new indexes and means)
- Progressive implementation of a 'bottom-up' approach; integration of farmers' decisions, opinions and criticisms (How to sustain/ enhance this strength: Farmers and their association are involved gradually in the approach and their critics, comments, feedbacks respected)

Weaknesses/ disadvantages/ risks: land user's viewhow to overcome

- Information availability: up to now information and communication on NTT is scarce intensify training of trainees
- In some situations (farmers with very low incomes), the need for external inputs such as herbicides, seeds, fertilizers and drills may retard implementation of NTT Incentives should be maintained for a short period and supplemented by credit systems.

Weaknesses/ disadvantages/ risks: compiler’s or other key resource person’s viewhow to overcome

- Direct incentives: there is always a risk that when eliminating these incentives, farmers will abandon NTT Eliminate incentives gradually and replace with loans and credits.
- The programme's duration is currently too short to overcome resistance (to new technology adoption) and to address economic constraints of farmers A long term programme is needed to increase acceptance among farmers.

REFERENCES

Compiler
Rachid Mrabet

Editors

Reviewer
David Streiff
Alexandra Gavilano
Deborah Niggli

Date of documentation: Jan. 19, 2009

Last update: April 4, 2018

Resource persons
Rachid Mrabet (mrabet_rachid@hotmail.com) - SLM specialist

Full description in the WOCAT database
https://qcat.wocat.net/en/wocat/approaches/view/approaches_2355/

Linked SLM data
Technologies: No-till technology https://qcat.wocat.net/en/wocat/technologies/view/technologies_1253/
Technologies: No-till technology https://qcat.wocat.net/en/wocat/technologies/view/technologies_1253/
Technologies: No-till technology https://qcat.wocat.net/en/wocat/technologies/view/technologies_1253/
Technologies: Drainage Biofilter https://qcat.wocat.net/en/wocat/technologies/view/technologies_6259/

Documentation was faciliated by

Institution
- Institut National de la Recherche Agronomique Morocco (INRA-Morocco) - Morocco

Project
- Book project: where the land is greener - Case Studies and Analysis of Soil and Water Conservation Initiatives Worldwide (where the land is greener)

Key references

- Wall et al, 2002, Institutional aspects of conservation agriculture, International workshop on conservation agriculture for sustainable wheat production, 14-18, october 2002, Tastikent, Usbekistan: p.wall@cgiar.org
- Segry, L.; Bouzinac, S and Pieri, C. 1991: An Approach to the development of sustainable farming systems. World echnical papaer N-2, ISBRAM proceedings 1991: