



Instrument: **INCO Specific Support Action**

Thematic priority: **Rational use of natural resources. Managing arid and semi-arid ecosystems**

## **AIDA FINAL REPORT**

### **Part 1: Publishable Final Activity Report**

Date of preparation: **April, 2010**

Start date of contract: **December, 26<sup>th</sup>, 2009**

Duration: **36 months**

Project Coordinator name: **Danièle Clavel**

Project coordination organisation name: **CIRAD**

# **AIDA FINAL REPORT**

## **Part 1: Publishable Final Activity Report**

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## **Section 1 –AIDA Project work description**

This section summarises the context, objectives, activities and approach used in the AIDA Project.

### **1.1. General context**

In Africa, 268 million people (about 40 % of the continent's population) are living in dryland areas with an annual rainfall between 300 and 800 mm (Figure 1) the majority depends on arable farming and/or pastoralism. In Dryland Africa, poverty and recurrent drought affect millions of people increasingly severely as testified by the more frequent severe food crises. The natural resource base of drylands in Africa is under continuous threat from wind and water erosion, the mining of soil fertility aggravates these processes resulting in severe land degradation and desertification.

Unjustly drylands are too often seen as non-productive lands and their importance and contributions to the livelihood of millions of people are not given sufficient attention especially because of this false perception that little can be done to sustainably raise productivity and improve the capacity to support viable human livelihoods. However Dryland people have developed resilient strategies for surviving in these conditions. In addition, climate change is compounding the risks and stresses that they have to cope with.

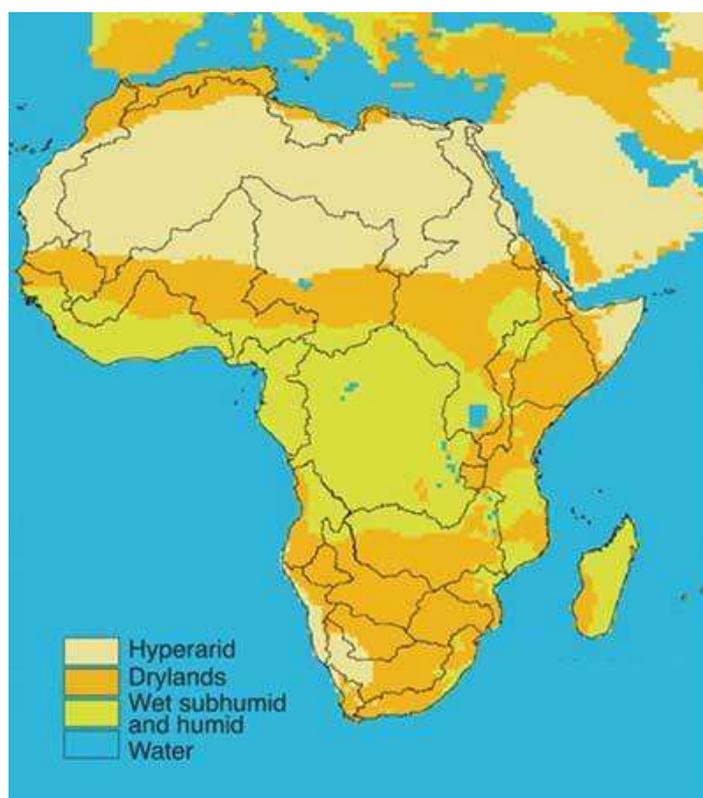


Figure 1. Climatic areas in Africa

## 1.2. Objectives of the AIDA Project

The ‘Agricultural Innovation in Dryland Africa’ (AIDA) was designed, as a three year EU FP6 Specific Support Action, to guide future European FP7 and EDF10 actions. AIDA Project was conducted under African – European partnership on agricultural research for development (PAEPARD), Phase 1 umbrella and designed to facilitate further proposals and initiatives for rural Dryland Africa’s development.

AIDA Project involved eight European and African institutions (CTA, CIRAD, FARA, RUFORUM, University of Nairobi, Agrhymet Regional center, Bunda College-University of Malawi, PRI-DLO/Wageningen University) (Table 1).

Table 1: list of participants

N°	Institution	Country	Contact Person
<b>1</b> Coord	Centre de coopération internationale en recherche agronomique pour le développement <b>CIRAD</b>	France	Dr Danièle CLAVEL clavel@cirad.fr
<b>2</b>	University of Nairobi <b>UoN</b>	Kenya	Prof. Agnes MWANGOMBE Mwangombe@kenyaweb.com
<b>3</b>	Agrhymet Regional Centre <b>ARC</b>	Niger	Dr Hamidou Djibo h.djibo@aghrymet.ne
<b>4</b>	Regional Universities Forum for Capacity Building in Agriculture <b>RUFORUM</b>	Uganda	Prof. Ekwamu ADIPALA eadipala@agric.mak.ac.ug
<b>5</b>	University of Malawi -Bunda College <b>UoM</b>	Malawi	Dr Henry MLOZABANDA mlozab@chanco.unima.mw
<b>6</b>	Wageningen University & Research centre <b>PRI-DLO-WUR</b>	Netherlands	M. Jan VERHAGEN a.verhagen@wur.nl
<b>7</b>	Forum for Agricultural Research in Africa <b>FARA</b>	Ghana	Ralph von KAUFMANN r.von-kaufmann@CGIAR.ORG
<b>8</b>	The Technical Centre for Agricultural and Rural Cooperation ACP-EU <b>CTA</b>	Netherlands	Mrs Judith FRANCIS Francis@cta.int

The overall objective addressed by AIDA is to deliver a critical assessment of some initiatives for rural development in Dryland Africa to identify key drivers and criteria for successes. The proposal was designed to promote local and regional institutional capacity and to encourage innovations and interventions in dryland’s agriculture for sustainable livelihoods.

The specific objectives are:

- to synthesize knowledge of available experience and interventions and identify case studies for in-depth analysis;
- to develop a generic framework and tools (key criteria and benchmark indicators) for identification and analysis of projects and success stories in dryland’s agriculture;
- to determine the potential drivers for success in dryland’s agriculture based on case studies;
- to formulate recommendations for supporting policy decisions and promoting investments in agricultural innovation in Africa Dryland.

### 1.3 Approach and work plan used in the AIDA Project

To meet these objectives, five complementary workpackages and corresponding objectives were designed (Table 2).

Table 2: AIDA Workpackage's brief description

N°	WP Title	Leader	Main objective
1	Overall coordination and management activities	CIRAD	To manage the scientific tasks, meetings, human and financial resources of the consortium
2	Determination of criteria of success in rural innovations in drylands agriculture	PRI-DLO WUR	To develop key criteria for CS analysis To design a framework and tools for analysis CS
3	Identification and selection of case studies based on established criteria	University of Nairobi	To synthesize knowledge of available success stories and identify CS studies for in-depth analysis
4	Conduct of case studies	University of Nairobi	To determine the potential drivers and indicators for success
5	Raising awareness & disseminating results to target groups	CTA	To raise awareness and communicate lessons learned through existing platforms To influence policy processes

The sequence of activities were the following:

1. *Review existing approaches and develop an analysis method* that takes the context and actors into account. This has been achieved by literature review and organisation of the international launching Conference in Accra (January, 22-25, 2007): 'Agricultural innovations in Dryland Africa: What are the Drivers of Success? This conference, co sponsored by CIRAD, CTA and FARA gave the opportunity to identify 55 cases studies from ten African countries and define broadly the main factors for successful innovation.

2. *Synthesize knowledge of available success stories* by announcing calls for practitioners to submit innovative project, which will be pre-screened prior to hosting international meetings to validate and apply the methodology for identifying successful cases for further in-depth analysis. The key messages and case studies of the launching Conference in Accra are available on the AIDA Web site: <http://inco-aida.cirad.fr>. The International workshop in Nairobi (November, 26-29, 2007) focused on the framework of analysis for assessment of successes in agricultural innovation in relation with the WP2: Determination of criteria of success in rural innovations in Dryland agriculture: a framework for the analysis of AIDA CS (section 2.1, page 8).

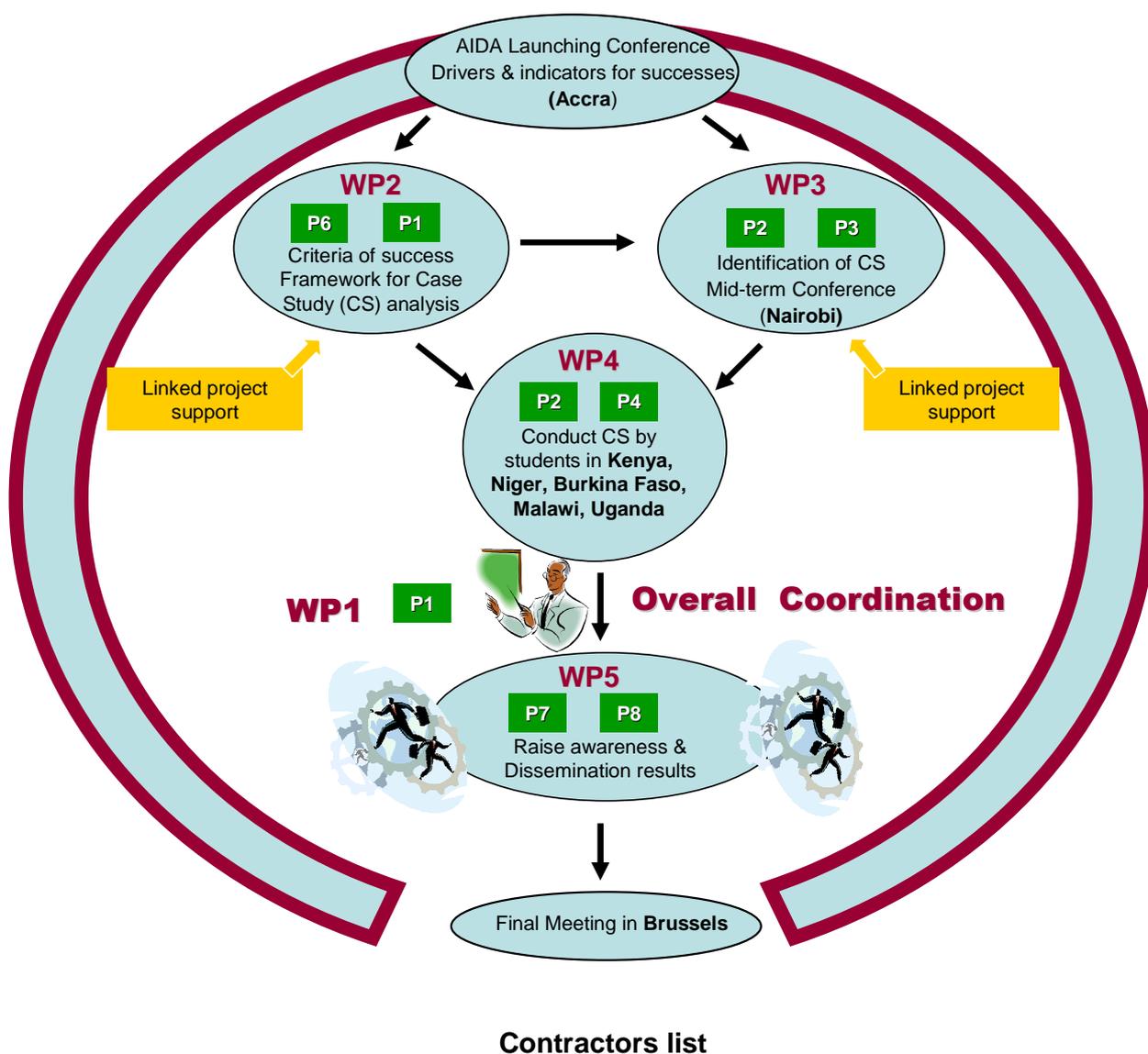
3. *Conduct case studies to identify the drivers for success*. Fifteen postgraduate students from Kenya, Malawi, Niger, Uganda and Burkina Faso supervised by their EU/African EG had conducted more in-depth analysis of the identified case studies. The timetable of the postgraduate fellows has been established to fit with agenda of related International Workshop or Meetings (CTA Annual Seminar in October 2008 and 2009 and the APPRI International Workshop, October 2008) and the University

agenda. The main results are presented under WP3-Identification and selection of case studies based on established criteria (section 2.2, page 10) and the WP4-Conduct of case studies (section 2.3, page 11).

4. *Raise awareness, publish and disseminate results.* This point is viewed as critical because the appropriate sharing of information knowledge and findings are often disregarded whereas it is probably essential to ensure the innovations sustainability and continuity. Conferences and linkages with established platforms as PAEPARD, FARA, CIRAD, and CTA are used for disseminating information. The involvement of the media is seen as critical for bringing the information to the widest possible target audience with special attention being paid to end-users. The activities related to this topic were assembled in the WP5: 'Raising awareness & disseminating results to target groups. Promoting and up-scaling successes' and reported in the Final AIDA Final report-Part2: Final plan for using and disseminating the knowledge.

### 1.4. Workpackages design and timetable of the activities implemented during the AIDA Project

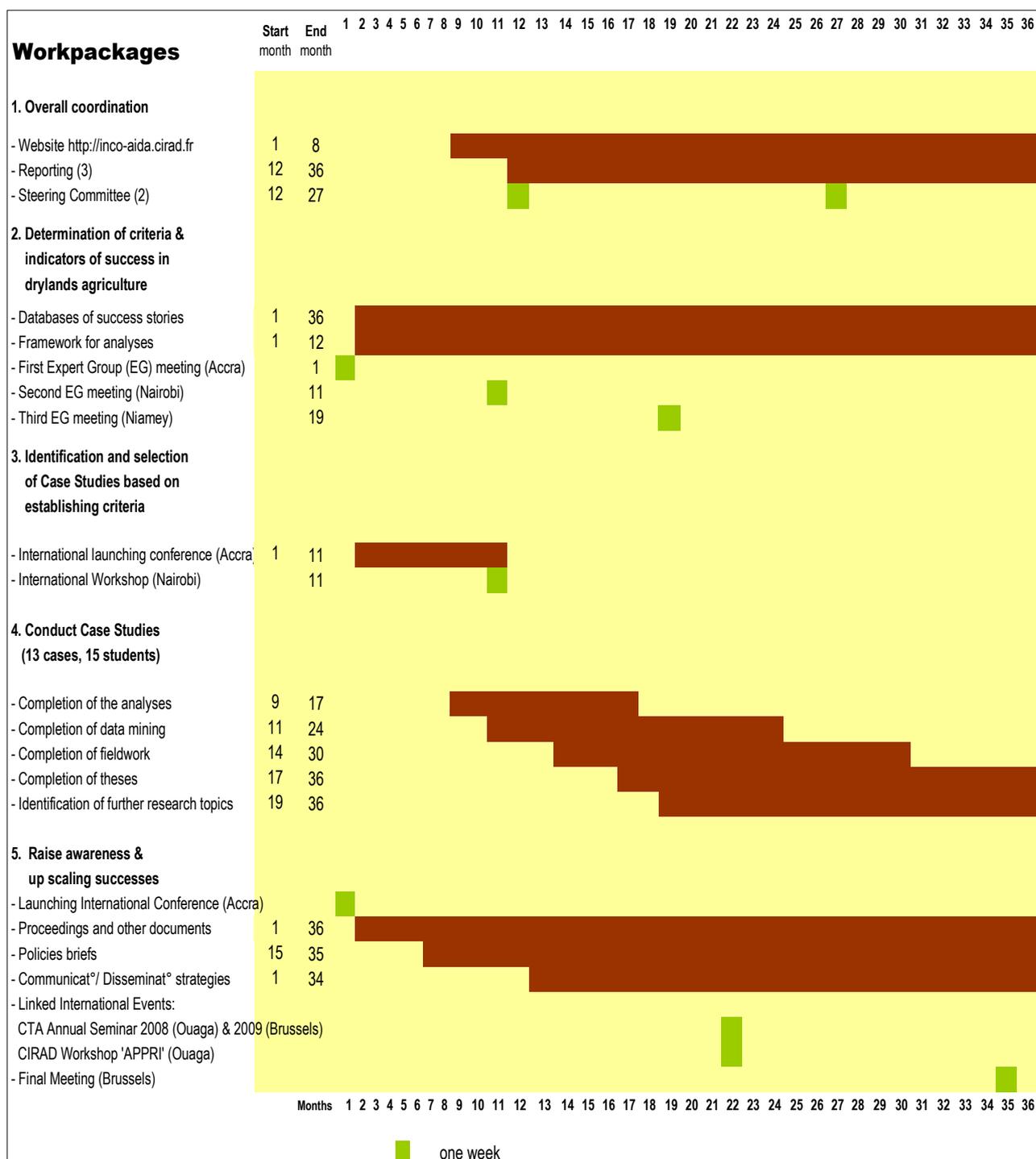
The workpackage’s design and timing of the main activities implemented during the project are summarised in the Figure 2 and Table 3.



- |                                       |   |
|---------------------------------------|---|
| <b>P1</b> CIRAD (France), Coordinator | <b>P5</b> UoM Bunda College (Malawi)    |
| <b>P2</b> UoN (Kenya)                 | <b>P6</b> DLO-PRI-WUR (The Netherlands) |
| <b>P3</b> AGRHYMET ( Niger)           | <b>P7</b> FARA (Ghana)                  |
| <b>P4</b> RUFORUM (Uganda)            | <b>P8</b> CTA (The Netherlands)         |

Figure 2: Relationships between workpackages

Table 3: Timetable of activities according to the Workpackages (last updated in December 2009)



## **Section 2 – Workpackage achievements**

This section summarizes the work performed under the different workpackages

### **2.1. WP1 - Overall coordination and management activities**

Leader: Partner 1: CIRAD

Objective: To manage the scientific tasks, meetings, human and financial resources of the Consortium

This part informed in the Final Management Report.

### **2.2. WP2 - Determination of criteria of success in rural innovations in Dryland agriculture: a framework for the analysis of AIDA Case Studies**

Leader: Partner 6: PRI-DLO-University of Wageningen in liaison with CTA (P8), CIRAD (P1) and UoN (P2)

Objective: To develop key criteria for identification and analysis of CS and to design a framework and tools for analysis CS

#### **Introduction**

The major purpose of the AIDA Project is to contribute to the knowledge in the domain of rural innovations in Dryland Africa. The main objective was to document and analyse interventions and success stories to identify the drivers behind the successes for developing policy options and management strategies for up and out-scaling rural innovations in Dryland Africa. By understanding the drivers of change and underlying processes, lessons can be drawn from success stories in Dryland Africa. These lessons can be adapted and replicated to out-scale successes, thereby stimulating desired development processes. Thus the project outcomes are also instrumental in serving as a basis to:

- Identify the keys drivers and indicators of success;
- Establish a framework for analysis of cases studies;
- Deliver a comprehensive and critical assessment of initiatives for rural development in Dryland Africa;
- Develop policy options and management strategies in Dryland agriculture and natural resources management.

This paper provides a critical analysis of the studies implemented about factors and drivers of successes in Dryland Africa and indicate the way forward for supporting the Dryland people's capacity to manage and control their living environment.

#### **Methods**

A framework to compare and analyze innovations in AIDA CS was attempted during the AIDA project using the insight obtained in the evaluation of 22 Case Studies (CS) in eight African countries (Burkina Faso, Ethiopia, Kenya, Malawi, Mali, Morocco, Tanzania, Niger, Uganda). The analysis of Case Studies by CTA is detailed in the *Annex 1*.

Central to the framework are critical factors, drivers and indicators for success. These factors link to sustainable development captured in the three dimensions, people (social cultural), planet (environment preservation) and income (market), and following the Brundtland definition of sustainable development: “development that meets the needs of the present without compromising the ability of future generations to meet their own needs”.

A useful framework has to capture the diversity in contexts, the complexity of the issues, types of innovations at various levels of integration, actors involved, and approaches used in the different CS.

Three main issues are raised in relation to the framework development:

- How to create a common understanding between and among the different actors involved?
- How to facilitate sharing of the information generated by analyses?
- How to stimulate endogenous capacity of all actors including Dryland people and governments for further adaptation and actions?

## Results and discussion

The findings of the AIDA Project are strongly related to the innovative capacity of the rural populations in dryland Africa. Therefore the framework is designed with a focus on the farm household system and farm level activities. However, actors and processes at other scales are not disregarded. In the initial scanning and selection of the case studies, a limited set of indicators was used:

- Nature of the Success;
- Evidence of Impact;
- Evidence of Community involvement;
- Potential for Out scaling

From the selected case studies a wide range of innovations and innovative practices emerged. These innovations are grouped using qualitative scales including technological (technology oriented) to economic/market (market oriented) and formal to informal social structures (Figure 2)

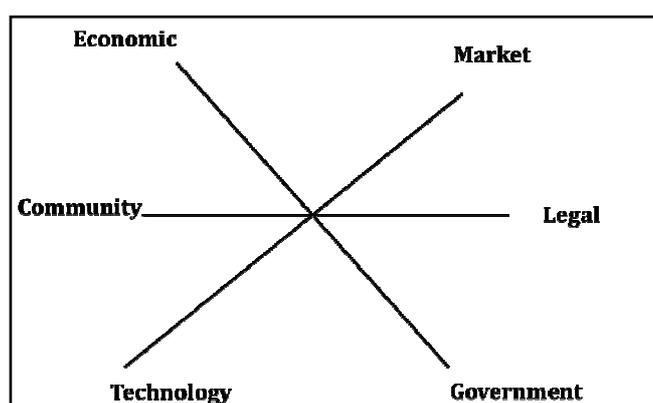


Figure 2: Diagram for CS and project characterization

By using additional information from the reports produced by the African partner institutions, an even more detailed picture can be extracted in which two factors:

- 1) true adoption by the stakeholders (i.e. having the power to influence and control the innovation process)
- 2) scaling capacity in the (i) methodological, (ii) biophysical, and (iii) economical-social-cultural domain are decisive.

A further analysis of the 22 CS focussed on the question ‘*What are the key factors to consider for an innovation to be a sustainable success and to be out scaled?*’ The classification structure is based on a description of the studies using the innovation as entry point. The nature or type of innovation is described in terms of origin (time & place). Other detailed information on the scale of adoption, and impact are documented. External drivers such as interventions in Communication, Policy and Science and Technology are addressed explicitly to provide links with Development and possible options for future work. Bottlenecks and constraints are discussed (*Annex 1.1* and *Annex 1.2*).

## Conclusions

The Dryland people, the innovations, science and technology, and policy are embodied in a communication and education framework whereby all actors can learn from each other, and these are all critical features for achieving success in Africa’s Drylands. However designing an integrated model to boost innovation processes for the sustainable Development of Africa’s Dryland represents a huge research field to be further investigated. It is probable that future research for development must deal with the question of establishing the new research frontiers for agronomy, livestock, environmental, social and human sciences to list a few.

The main merit of the AIDA Project is to have gathered a consortium of scientists from different disciplines and cultural backgrounds to pave the way for further investigations in the knowledge production and sharing that are required for achieving sustainable Development.

## Recommendations/ Way forward

So far the framework seems to capture the most important issues for the AIDA project. Unfortunately it could not be tested to its full extent. Whether the detail needed to evaluate the different cases studies is achieved and how to up and out-scale the framework is not clear.

We are confident that generalizations can be extracted by the framework, this would however require a more rigorous screening of the individual case studies. This was beyond the reach of the project. It assisted the AIDA project team in discussions and formalisation of the outcomes.

Future work could learn from the methodology outlined and use it as basis. The design is flexible enough and allows for adjustments to local situations and needs. If not to benchmark different technologies and approaches it can be useful in focussing discussions amongst stakeholders.

## 2.3. WP3 - Identification and selection of case studies based on established criteria

Objective: To synthesize knowledge of available successes stories and identify Case Studies (CS) for in-depth analysis.

Leader: Partner 2: University of Nairobi (UoN) in liaison with Partner 1 and Partner 6.

### Introduction

The AIDA project aimed at delivering a comprehensive and critical assessment of initiatives for rural development in dryland Africa and to identify key drivers for success. This information can be useful in policy making and planning processes. AIDA set to structure the development of key criteria for identification and analysis of success stories in agriculture in sub Saharan Africa and success stories at the local scale/farm household and community. The framework was designed with a strong focus on farm level activities while incorporating other actors and processes.

## Objective

The basic idea was that understanding drivers of changes and underlying processes, lessons can be drawn from success stories and using the obtained insights these lessons can be adapted and replicated to out-scale successes so stimulating desired development processes.

## Methods

- Call for success stories on dryland agriculture
- Pre-screening to identify and select case studies: collecting and collating available data on success stories
- Organize an International Workshop (IW) and link to other regional and international initiatives International workshop held in Nairobi and case studies identified based on established criteria
- Completion of data mining
- Screening and validation of the successful case studies
- Analyze and synthesize knowledge of available success stories. Evaluation of the factors behind the success of the case study in the local environment; by analysing the social, cultural, economic, market, political, technical and environmental issues
- Developing the tools for capturing the perspectives of the communities, change agent (extension service, input providers) and policy makers
- Validate and apply the methodology for identifying successful cases for further in-depth analysis (partly done)

## Results

- Database on development projects and success stories on drylands agriculture
- Template form as tool to document and analysis of the case studies (*Annex 2*)

## 2.4. WP4 - Conduct of case studies

Objectives: To determine the potential drivers and indicators for success in drylands agriculture

Leader: Partner 2: University of Nairobi (UoN) in liaison with Partner 1 and Partner 6.

## Methods

- Post graduate students supervised by the respective scientists from the various disciplines conducted more in-depth analysis of the identified case studies
- Collecting and collating all available information about the case study and its economic and ecological environments by the students supervised by Departmental staff
- Testing of the hypotheses with the communities and change agents. This was done utilizing participatory rural appraisal (PRA) techniques for qualitative data which backed up by semi-structured questionnaires to collect quantitative data.
- Other tools used were structured questionnaires, focused group discussions, semi-structured interviews, key informant interviews, transects walks, On farm trials at the farmers fields among others.

## Results

Fourteen students post graduated: five in Kenya, three in Niger, two in Malawi, two in Uganda, and two in Burkina Faso (Table 3)

Detailed information on CS analysis is available in *Annex 1.1* and *Annex 1.2*

**Table 3:** list of the students and thesis supported by the AIDA Project

Student	Institution	Title of thesis
Mr. Mganga Zowe <b>Kenya</b>	University of Nairobi, faculty of Agriculture, Department of land Resource Management and Agricultural Technology	The Impact of Grass Reseeding Technology as a Means of Rehabilitating Degraded Rangelands: A Case of Kibwezi District, Kenya.
Ms. Irene Koki <b>Kenya</b>	University of Nairobi, faculty of Agriculture, Department of land Resource Management and Agricultural Technology	Rangeland Resource Management Technology Adoption among agro pastoral households in South-Eastern Kenya, its Influence on Factor Productivity and Poverty Alleviation
Ms. Anne Karuma <b>Kenya</b>	University of Nairobi, faculty of Agriculture, Department of land Resource Management and Agricultural Technology	Effects of legume cover crops and sub-soiling on soil properties and crop yields in Machakos district, Kenya
Mr. Olesarioyo Joseph Seneiya <b>Kenya</b>	University of Nairobi, faculty of Veterinary Medicine, Department of Public Health, Pharmacology and Toxicology	Assessing trade-offs between pastoral economy and wildlife conservation in the Ewaso Nyiro Bassin, northern Kenya: a case study of Naibung'a and Namunyak conservancies
Ms. Eddah Kinyuna <b>Kenya</b>	University of Nairobi, faculty of Agriculture, Department of Plant Science and Crop Protection	Adoption of improved pigeon pea technologies and their current state of practice in Taita and Mbeere Districts <u>For the record, the CS was not completed because the student dropped out.</u>
Ms. Zipora Otieno <b>Kenya</b>	University of Nairobi, faculty of Agriculture, Department of Agricultural Economics	The role of variety attributes on the adoption of dryland crop varieties: the case of pigeonpea production in Taita district, Kenya
		
Mr. Kader Mohamed <b>Niger</b>	AGRHYMET Regional Center	Sanding-up dynamics in the Niger river Valley and Analysis of Control Methods: case of the Municipalities of Bittinkodji and Namaro
Ms. Teresa Fernandes Pereina de Veiga Tavares <b>Cape Verde</b>	AGRHYMET Regional Center	Study and analysis of the impact of Agricultural Holdings and Livestock Farms Located around protected areas: case of the 'W' Park of Niger
		
Mr. Mouga Masdewell Blaise <b>Republic of Chad</b>	AGRHYMET Regional Center	Ecosystem Spatio-Temporel Dynamics in the Gazetted Forest of Yamba Berté: Consequences in terms of concerted Residual Resource Management

Student	Institution	Title of thesis
Mr. Mavuto Chagomerana Mdulamzu <b>Malawi</b> 	University of Malawi, Bunda College, Lilongwe	An assessment of Successful farmer Groups in land and water Management systems in Dry lands of Malawi: A case of Chinguluwe and Nkomba in Salima and Balaka Disticts
Mr. Powell Mponela <b>Malawi</b>	University of Malawi, Bunda College, Lilongwe	Spatial analysis of land and water resources for dryland management, in Chingale, Zomba District
Mr. Nampijja, J <b>Uganda</b>	Institute of Environmental Studies, Makerere University	Adaptation strategies to climate change and variability in semi-arid regions of Uganda
Mr. Tumuhairwe, S <b>Uganda</b>	Institute of Environnemental Studies, Makerere University	Agro pastoral adaptation strategies to climate shocks and land use change in South western rage land of Uganda
Ms Delphine Droux <b>France</b> 	University of Paris XII Master II – Bio ressources en régions tropicales et méditerranéennes	Strengthen the knowledge and references on rehabilitation of degraded soils in the central plateau of Burkina Faso with the technique of mechanized Zai <u>Part 1:</u> Explore spatial variability and/or conditions and consolidate knowledge on: - the percentage of degraded land - the comparison of manual and mechanized Zai on soil fertility, time consuming and increase of incomes for farmers
Mr. Abdoulaye Ragbo <b>Burkina Faso</b>	University of Ouagadougou, Department of Geography	Strengthen the knowledge and references on rehabilitation of degraded soild in the central plateaux of Burkina-Faso with the Technique of mechanized zai. <u>Part 2:</u> Explore spatial variability and/or conditions and consolidate knowledge on the extent of the mechanized Zai practices, their variability among farmers and farmer's perception

## **2.5. WP5 - Raising awareness & disseminating results to target groups. Promoting and up-scaling successes**

Leader: Partner **8**: Technical Centre for Agricultural and Rural Cooperation ACP-EU (CTA)

Objective: To raise awareness and communicate lessons learned through existing platforms. To influence policy processes to support sustainable development.

The activities achieved under the WP5 are detailed in the Final Report Part 2: Final Plan for Using and Disseminating the Knowledge.

### **Section 3 – Main results obtained from the AIDA Project**

This section reports the main findings achieved during the whole duration of the Project from January 2007 to December 2009.

The following table 4 indicates for each result: (i) the brief description (ii) the stage of development, (iii) the partners involved, and, if any, (iii) the associated annexes for details.

Table 4: AIDA Project main results

<b>Result description</b>	<b>Content and Public targeted</b>	<b>Stage of development</b>	<b>Partners involved</b>	<b>Contact details</b>
AIDA Database inco-aida@cirad.fr	Fields studies & Scientific knowledge  Public: researchers and development practitioners	Updated	AIDA Management team	clavel@cirad.fr
<u>Article:</u> Changements techniques et dynamique d'innovation agricole en Afrique Sahélienne: le cas du Zaï mécanisé au Burkina Faso et de l'introduction d'une cactée en Ethiopie	Online revue vertigo.revues.org  Scientific knowledge	Published in Vertigô, Vol 8, N°3, 2008	Clavel D, Cirad, (France)  Barro A, INERA (Burkina Faso)  Belay T, Mikelle University, (Ethiopia)  Lahmar R, Cirad, (Burkina Faso)  Maraux F, Cirad, (France)	<a href="mailto:clavel@cirad.fr">clavel@cirad.fr</a> <a href="http://vertigo.revues.org/">http://vertigo.revues.org/</a>
<u>Book:</u> AIDA, Synthesis Report, International Conference On Agricultural Innovation in Dryland Africa, Accra, Ghana, 22-24 January, 2007 English & French	Fields studies & Scientific knowledge  Public: researchers and development practitioners	Published in 2008, CTA (Ed), Wageningen, The Netherlands, 12p	Francis J, CTA, The Netherland  Clavel, D, Cirad, France  Verhagen, J, WUR_PRI DLO, The Netherlands  von Kaufmann, R, FARA (Ghana)  Wopereis M, AfricaRice (Benin)	Francis@cta.int

## AIDA Project main results (continuation)

Result description	Content and Public targeted	Stage of development	Partners involved	Contact details
<p><u>Poster:</u> Innovations and learning processes in rural zones of Africa: interactive knowledge sharing gateways for sustainable social as well as technical progress. <i>Annex 3</i></p>	<p>Fields studies &amp; Scientific knowledge Public: researchers and development practitioners</p>	<p>Published: top ten winner poster's competition, Science Forum 2009, 15-16 June 2009, Wageningen</p>	<p>Clavel D, Cirad, (France) Andela C, Cosader, (Cameroun) Ouattara S, Jade Production, (Burkina Faso) Ndiaye O, CTA</p>	<p>clavel@cirad.fr</p>
<p><u>Report:</u> Dryland parallel session on arid zones at CTA annual seminar Conference in Brussels (12-16 October 2009)</p>	<p>Fields studies &amp; Scientific knowledge Public: researchers and development practitioners</p>	<p>In progress (CTA editor)</p>	<p>Judith Francis, CTA Yodith Kebedé, CTA</p>	<p>Francis@cta.int</p>
<p><u>Commissioned student research project:</u> "Developing African-European partnership on dryland research" <i>Annex 4</i></p>	<p>Fields studies &amp; Scientific knowledge Public: researchers and development practitioners</p>	<p>Report 'Making Dryland research matter' Published</p>	<p>Judith Francis, CTA</p>	<p>Francis@cta.int</p>
<p><u>Book:</u> "Stakeholder in rural innovation in Dryland Africa" from APPRI 2008 Workshop, Ouagadougou, 21-24 October 2008) English &amp; French <i>Annex 5</i></p>	<p>Fields studies &amp; Scientific knowledge Public: researchers and development practitioners</p>	<p>in progress ACP countries &amp; International</p>	<p>Danièle Clavel, Cirad (France) Jenessi Matturi, CTA editions</p>	<p>clavel@cirad.fr</p>
<p><u>Report:</u> Survey among policy makers 'Why Invest in Africa's Dryland ?' <i>Annex 6.1 &amp; 6.2</i></p>	<p>Fields studies &amp; Scientific knowledge Public: researchers and development practitioners</p>	<p>Report published, ACP countries</p>	<p>Judith Francis, CTA Yodith Kébedé, CTA</p>	<p>Francis@cta.org</p>
<p><u>Policy Brief:</u> Two pages policy brief: "Investing in Africa's Drylands – Key Drivers of Success" <i>Annex 7</i></p>	<p>Policy guidance Public: Researchers, academics, policymakers, donors, development practitioners</p>	<p>Published</p>	<p>Judith Francis, CTA Yodith Kébedé, CTA</p>	<p>Francis@cta.org</p>

## AIDA Project main results (continuation)

Result description	Content and Public targeted	Stage of development	Partners involved	Contact details
<p><u>Video:</u> AIDA video 'Why Invest in Africa's Drylands?'</p>	<p>Public: Researchers, academics, development practitioners policymakers</p>	<p>Video under production</p>	<p>Judith Francis, CTA</p>	<p>Francis @cta.org</p>
<p><u>Poster :</u> <i>'Perception paysannes des effets du Zai dans la société Mossi du Burkina Faso.'</i> Poster selected for the CTA annual seminar 12-16 October 2009, Brussels, Belgium. <i>Annex 8</i></p>	<p>Fields studies &amp; Scientific knowledge</p> <p>Public: researchers and development practitioners</p>	<p>Presented at the 2009 CTA annual seminar, Dryland session</p>	<p>Rabdo A, (student) Barro A, Inera, Burkina Faso (BF) Lahmar R, Cirad BF Zougmore R, Inera, BF Clavel D, Cirad, France Maraux F, Cirad, France Dugué P, Cirad, France</p>	<p>altbarro@yahoo.fr</p>
<p><u>Communication:</u> <i>'Strengthen the knowledge and references on rehabilitation of degraded soils in the central plateau of Burkina Faso with the technique of mechanized Zai'</i> Presentation selected for CTA annual seminar, 12-16 October 2009, Brussels, Belgium <i>Annex 9</i></p>	<p>Fields studies &amp; Scientific knowledge</p> <p>Public: Researchers, academics, policymakers, donors, development practitioners</p>	<p>Master memoir defended University of Paris XII, September 2008 Presented at the 2009 CTA annual seminar, Dryland session</p>	<p>Droux D, France (student) Barro A, INERA, Burkina Faso Zougmouré R, INERA, Burkina Faso Dr R Lahmar CIRAD, Burkina Faso</p>	<p>altbarro@yahoo.fr</p>
<p><u>Communication:</u> <i>'Study and analysis of the impact of Agricultural Holdings and Livestock Farms Located around protected areas: case of the 'W' Park of Niger'</i> Presentation selected for the CTA annual seminar' 12-16 October 2009, Brussels, Belgium. <i>Annex 9</i></p>	<p>Fields studies &amp; Scientific knowledge</p> <p>Public: researchers, Development practitioners</p>	<p>Master memoir defended University of Niger &amp; ARC Presented at the 2009 CTA annual seminar, Dryland session</p>	<p>Ms Teresa Fernandes Pereina de Veiga Tavares, Cape Verde (student) Hamidou Djibo, ARC Niger</p>	<p>h.djibo@agrhyment.ne</p>

## AIDA Project main results (Continuation)

Result description	Content and Public targeted	Stage of development	Partners involved	Contact details
<p><u>Communication:</u> <i>'The role of variety attributes on the adoption of dryland crop varieties: the case of pigeon pea production in Taita district, Kenya.'</i></p> <p>Presentation selected for the CTA annual seminar' 12-16 October 2009, Brussels, Belgium.</p> <p><i>Annex 9</i></p>	<p>Fields studies &amp; Scientific knowledge</p> <p>Public: researchers, development practitioners</p>	<p>Master memoir defended, University of Nairobi, faculty of Agriculture, Department of Agricultural Economics</p> <p>Presented at the 2009 CTA annual seminar, Dryland session</p>	<p>Ms. Zipora Otieno (student) University of Nairobi (UoN), Kenya</p>	<p><a href="mailto:wmmuiru27@hotmail.com">wmmuiru27@hotmail.com</a></p> <p><a href="mailto:mwangombe@kenyaweb.com">mwangombe@kenyaweb.com</a></p>
<p><u>Communication:</u> <i>An assessment of Successful farmer Groups in land and water Management systems in Dry lands of Malawi: A case of Chinguluwe and Nkomba in Salima and Balaka Disticts</i></p> <p>Presentation selected for the 2009 CTA annual seminar' 12-16 October Brussels, Belgium.</p> <p><i>Annex 9</i></p>	<p>Fields studies &amp; Scientific knowledge</p> <p>Public: researchers, development practitioners</p>	<p>Master memoir defended University of Malawi, Bunda College, Lilongwe, Malawi</p> <p>Presented at the 2009 CTA annual seminar, Dryland session</p>	<p>Mr. Mavuto Chagomerana Mdulamzu (student), Bunda College, University of Malawi</p>	<p><a href="mailto:mlozab@chanco.unima.mw">mlozab@chanco.unima.mw</a></p>
<p><u>Poster:</u> <i>'Efficiency of contour bunds and nutrient losses from major agricultural land use type of the lake Victoria catchment'</i></p> <p><i>Annex 10</i></p>	<p>Fields studies &amp; Scientific knowledge</p> <p>Public: researchers, Development practitioners</p>	<p>Printed and disseminated</p>	<p>Majaliwa.J.G.M Magunda M.K, Tenywa M.M, Semalulu O, Rusoke C</p> <p>RUFORUM and Makerere University Kampala, Uganda</p>	<p><a href="mailto:majaliwam@hotmail.com">majaliwam@hotmail.com</a></p>

## AIDA Project main results (End)

Result description	Content and Public targeted	Stage of development	Partners involved	Contact details
<p><u>Poster:</u> ‘Pastoral adaptation strategies to climate shocks in rangeland of South Western Uganda ‘ <i>Annex 11</i></p>	<p>Fields studies &amp; Scientific knowledge</p> <p>Public: researchers, Development practitioners</p>	Printed and disseminated	<p>Tumuhairwe S<sup>1</sup> Massa MH<sup>1</sup>, Majaliwa JGM<sup>1</sup>, Isubikalu P, Mukwaya P Adipala, E<sup>2</sup> <sup>1</sup> Makerere University, Kampala, Uganda <sup>2</sup> RUFORUM, Kampala, Uganda</p>	majaliwam@hotmail.com
<p><u>Book</u> Technical sheets: Erosion and restoration of degraded soils in the Niger Basin, Compilation of technical Advice sheets, French and English version <i>Annex12</i></p>	Public : scientific knowledge and technical tool	Printed and disseminated through Cirad’s regional Direction in Africa and AIDA Project Partners.	<p>Mohamed Kader PLCE, Niger Hamidou Djibo Agrhymet, Niger Morant P, Cirad, France Clavel D, Cirad, France</p>	<p><a href="mailto:kader_mohamedfr@yahoo.fr">kader_mohamedfr@yahoo.fr</a> h.djibo@agrhyment.ne</p>



Project number: contract N°: **FP6-043863**

Project Acronym: **AIDA**

Project title: **Agricultural Innovation in Dryland Africa**

## **FINAL REPORT**

### **Part 1: Publishable Activity Report**





Instrument: **INCO Specific Support Action**

Thematic priority: **Rational use of natural resources. Managing arid and semi-arid ecosystems**

## **AIDA FINAL REPORT**

### **Part 2: Final Plan for Using and Disseminating the Knowledge**

Date of preparation: **April, 2010**

Start date of contract: **January 1<sup>st</sup>, 2007**

Duration: **36 months**

Project Coordinator name: **Danièle Clavel**

Project coordination organisation name: **CIRAD**

# **AIDA FINAL REPORT**

## **Part 2: Final Plan for Using and Disseminating the Knowledge**

### **Plan**

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## **Section 1 - Exploitable knowledge and its use**

In Africa, 268 million people (40 – 41 % of the continent's population) are living in drylands areas (annual rainfall between 300 and 800mm) and the majority of them depend on farming or pastoralism. In Dryland Africa, poverty and recurrent drought affect millions of people increasingly severely as testified by the more frequent severe food crises. The natural resource base of drylands in Africa is under continuous threat from wind and water erosion and nutrient mining resulting in severe land degradation and desertification. This is aggravated by increasing human and livestock populations and climate change.

Drylands are often seen as non-productive lands and their importance and contributions to the livelihood of millions of people are not given sufficient attention especially because of false perception that little can be done to sustainably raise productivity and improve their capacity to support viable human livelihoods. However Africa Dryland people have developed resilient strategies for surviving in these conditions. Thereby the primary contribution of the Agricultural Innovation in Dryland Africa (AIDA) project is foremost to disseminate research-based information about what communities need to survive and prosper and about what the drylands can sustainably produce taking advantage of their diversity.

### **1.1. Objectives of the AIDA Project**

The AIDA Project is an FP6 Specific Support Action between eight European and African institutions (CTA, CIRAD, FARA, RUFORUM, University of Nairobi, Agrhymet, Bunda College-University of Malawi, PRI-DLO/Wageningen University).

The AIDA project aims to deliver a comprehensive and critical assessment of initiatives for rural development in dryland Africa to identify key drivers for success and the factors that contribute to failed interventions and to share this knowledge with all stakeholders. It also seeks to propose policy options for regional, national and local investment in sustainable development of Africa's drylands.

In terms of communication, the main purpose of the 'Agricultural Innovation in Dryland Africa' (AIDA) is to highlight the success stories and their proper understanding to disseminate relevant messages amongst those concerned with African dry land development policies, programmes and research.

### **1.2. The AIDA Communication strategy**

The Communication strategy and the plan for using and disseminating the knowledge is part of the WP5 - Raising Awareness and Disseminating Results to Target Groups and Promoting and Out-scaling Successes lead by CTA (Partner 8).

The communication strategy implemented during AIDA Project was coordinated by Partner 8 (CTA) and Partner 7 (FARA) with the aims at raising awareness and internalisation process of the AIDA outcomes and facilitating the communication among partners

The purpose of this communication strategy is to ensure that the research-based conclusions and products from AIDA commissioned case studies and the application of the project's analytical framework reach those who can take advantage of them to improve the planning and execution of policies, development projects and research for dryland areas. It responds to the need for:

- raising awareness among diverse audiences about drylands and their potential to provide multiple goods and services: crops, forages, livestock products, conservation of freshwater and biodiversity, tourism, energy, carbon sequestration etc.

- providing, for international, regional and national decision makers, clear overviews of the productive and development potential of drylands in order to integrate them into the development policies and plans
- disseminating widely the successful initiatives in African dryland development identified during AIDA project and in particular the key drivers of success, which can contribute to the design and raising the impact of future initiatives.

The key exploitable knowledge & messages, desired effect or change according to the audience targeted and tools used are detailed in the following tables of key exploitable results and use.

**Section 1: Table of key exploitable knowledge & use**

Target audience	Sub-group audience	Key messages & exploitable knowledge	Desired effect/change	Communication tools
<b>Policy makers</b>	At international level	It is necessary and urgent to invest in drylands, in particular in research, capacity building, communication and in information tools and platforms	To get more investment in dryland-related projects and research To integrate drylands issues into regional enabling policies that are where necessary complementary to national policies	Parallel session on arid zones at CTA annual seminar in Brussels (12-16 October 2009) AIDA Policy brief & video WBI Program “Building Capacity for Climate Change Adaptation in Agriculture in West Africa”, Accra meeting (May 2009) FARA General Assembly (GA), 2010
	At regional level: (AUC-DREA, UN-ECA, AU-NEPAD, ECOWAS, IGAD, CILSS, COMESA, SADC)	A framework for analyses and criteria which enable evaluation of success in drylands with particular attention to access to credit, inputs and equitable terms of trade during crises.	To have an holistic approach to dryland area development  To adapt policies to the realities of local conditions	Accra conference synthesis report Parallel session on arid zones at CTA annual seminar in Brussels (12-16 October 2009) Policy brief & video Book Guide “Stakeholder in rural innovation in Dryland Africa” from APPRI Workshop (Ouaga, 21-24 October 2008), in English & French WBI Program “Building Capacity for CC Adaptation”, Accra meeting FARA GA 2010
	At national level: (Ministries of Agriculture and of Finance and Planning of countries in the Sahel, Horn of Africa, East and Southern Africa)			
	At local governmental agencies	There are drivers of successes locally and in neighbouring countries.  For better success there is need for more collaborative and participatory approaches	To work in collaboration with extensionists and farmers, to facilitate communication and enable value-adding matching of local and national policies	AIDA policy brief & video Papers presented at national & regional workshops

**Section 1: Table of key exploitable knowledge & use**

Target audience	Sub-group audience	Key messages & exploitable knowledge	Desired effect/change	Communication tools
<b>African dryland people</b>	Farmers (including farmer organizations), AFAAS, the four Regional Farmers Organizations of Sub-Saharan Africa; EAFF, PROPAC, ROPPA and SACAU and pastoral organisations such as Confederation of Traditional Herders Organization (CORET)	Share lessons learnt and best practices from case studies in drylands	To raise awareness of existing practices which have succeeded in other regions or countries with similar climatic conditions	Radio and TV programme / AIDA video  Technical booklet on soil anti-erosive techniques from CILSS AGRHYMET  Technical booklet from CILSS AGRHYMET
	Extensionists/ change agents	For better success in drylands there is a need for approaches that are more collaborative and participatory	To promote awareness and adoption of existing best practices and knowledge for local innovation and development	Project outcomes, articles partners' newsletter (e.g. CTA SPORE) or special issues on drylands?
	Researchers		To make dryland people part of the research programme design and implementation  Enabling contributions to innovations from ethnic knowledge and science.	Accra Conference Synthesis-report Parallel session on arid zones at CTA annual seminar Parallel session on arid zones at CTA annual seminar Conference in Brussels (12-16 October 2009) Policy briefs Abstracts from APPRI workshop computed on the open access sever "open-archives" Hal: <a href="http://hal.archives-ouvertes.fr/">http://hal.archives-ouvertes.fr/</a> Papers in international journals, FARA GA 2010

**Section 1: Table of key exploitable knowledge & use**

Target audience	Sub-group audience	Key messages & exploitable knowledge	Desired effect/change	Communication tools
<p><b>Development practitioners</b></p>	<p>International organizations</p>	<p>Projects which take the following elements into account have a better chance of succeeding if they:</p> <ul style="list-style-type: none"> <li>• are demand-driven or recognition of farmers’ knowledge and intellectual resources,</li> <li>• encourage and facilitate the participation of the end-users</li> <li>• ensure ownership of the development processes and outcomes</li> <li>• recognise the need to sustain continuity beyond the first interventions</li> </ul>	<p>Pay more attention to local needs, demands, practices and initiatives in designing projects.</p> <p>Integrate local people into all phases of the project</p>	<p>Post-Accra conference Synthesis-report Parallel session on arid zones at CTA annual seminar Conference in Brussels ,(12-16 October 2009)</p> <p>Policy briefs</p> <p>Post-APPRI Workshop</p> <p>Bilingual Book Guide in final process editing</p> <p>Linking websites</p>

**Section 1: Table of key exploitable knowledge & use**

Target audience	Sub-group audience	Key messages & exploitable knowledge	Desired effect/change	Communication tools
<b>Development practitioners (following)</b>	Local NGOs			Accra conference Synthesis-report Parallel session on arid zones at CTA annual seminar Conference in Brussels (12-16 October 2009)  Policy briefs  Post-APPRI Workshop Bilingual Book Guide  Bilingual technical booklet from CILSS Agrhymet  Policy briefs  Papers in international journals
<b>Researchers working on dryland issues</b>	European and International	To better take into consideration local knowledge and demands into research programmes, work more collaboratively with local researchers (Example of such research organizations: ICARDA, ICRISAT, CILSS, CIRDES)	More concerted and impact oriented research	Post-Accra conference, Synthesis-report,  Parallel session on arid zones at CTA annual seminar Conference in Brussels (12-16 October 2009),  Policy brief,  Post-APPRI Workshop bilingual Book Guide  Papers in international journals

**Section 1: Table of key exploitable knowledge & use**

Target audience	Sub-group audience	Key messages & exploitable knowledge	Desired effect/change	Communication tools
<p><b>Development institutions involved in dryland issues</b></p> <p><b>Networks / platforms for agricultural research</b></p>	<p>e.g., IFAD, UNDP Development drylands center United Nations Convention to Combat Desertification (UNCCD), Sahel and West Africa Club, SOS Sahel, World Bank, European Commission, UN Economic Commission for Africa (UN-ECA)</p> <p>Famine Early Warning Center Network, African Drought Risk and Development Network (FEWS NET), African Drought Adaptation Forum (ADAF), International Arid Lands Consortium (IALC) GFAR, FARA, ASARECA, CORAF/WECARD, CARDESA, NASRO, AU-IBAR, AU-SAFGRAD</p>	<p>Share lessons learnt and best practices identified from case studies</p>	<p>To inform them about AIDA findings and to get them disseminated through the organisations networks</p>	<p>Accra Conference Synthesis-report Conference in Brussels Policy briefs Synthesis of APPRI report Post-APPRI Workshop bilingual Book Guide Linking websites</p>

## **Section 2 – Dissemination of the knowledge**

The dissemination activities were conducted by all partners and coordinated by CTA (Partner 8) and CIRAD (Partner 1). The compilation was made by CTA, leader of the WP5 - Raising awareness & disseminating results to target groups. Promoting and up-scaling successes.

### **Section 2: Dissemination of the knowledge**

<b>Dates</b>	<b>Type</b>	<b>Type of audience</b>	<b>Countries addressed</b>	<b>Size of Audience</b>	<b>Partner responsible / involved</b>
January, 2007	Press release/ Flyers 1st International Conference, Accra, Ghana	General	Sub saharan Africa (SSA) /EU	500	CIRAD
January 2007	CIRAD's newsletter in English and in French		Western and Eastern, central and Southern Africa through CIRAD's regional Directors and correspondents (Kenya, Senegal, Burkina Faso, Zimbabwe...)	2400 registered users	CIRAD
January 2007	Media Interview – RMC; Reuters – D. Clavel	General	France and International		CIRAD
January 2007	Project website <a href="http://inco-aida.cirad.fr">http://inco-aida.cirad.fr</a> Eleven Success story paper presentations during the first International Conference- AIDA: What are the Drivers of Success?	Scientists, academics, policymaker, development practitioners	International	6400 unique visitors	CIRAD
February, 2007	CTA Knowledge website- Dossier on drylands <a href="http://knowledge.cta.int/en/content/view/full/4042">http://knowledge.cta.int/en/content/view/full/4042</a>	Researchers, academics, policymaker, development practitioners	ACP/EU	190 000 unique visitors annually; 1 700 E-mail newsletter subscribers and 1 326 registered users	CTA

**Section 2: Dissemination of the knowledge (continuation)**

<b>Dates</b>	<b>Type</b>	<b>Type of audience</b>	<b>Countries addressed</b>	<b>Size of Audience</b>	<b>Partner responsible / involved</b>
April, 2007	Article – Spore No. 128, April 2007, pg. 5 & <a href="http://www.spore.cta.int">www.spore.cta.int</a>	General	ACP	80 000	CTA
April 2007	RUFORUM website: <a href="http://www.ruforum.org">http://www.ruforum.org</a>	Universities academic & students	SSA and International	Over 1000 hits	RUFORUM
April 2007	Bunda College Website <a href="http://www.bunda.unima.mw">http://www.bunda.unima.mw</a>	General; Universities _ academics, practitioners	International	Undetermined; open access	Bunda College Library
June, 2007	Project presentation, FARA GA & African Science Week, South Africa	Scientists, policy makers	SSA & International	100	FARA
November 2007	AIDA mid-term workshop proceedings	General	International	~ 100 people	UoN and CIRAD
December 2007	Agrhymet newsletter, Website: <a href="http://www.agrhymet.net">http://www.agrhymet.net</a>	Policy makers, Scientists, researchers, academics, practitioners	CILSS and International	60 000	AGRHYMET
2007	Synthesis Report: Francis J, Clavel D, Verhagen J, von Kaufmann R and Wopereis M, 2007. International Conference On Agricultural Innovation in Dryland Africa, Accra, Ghana, 22-24 January, 2007, CTA (Ed) Wageningen, Netherland, 12 p.	Scientists, policy makers	SSA & International		CTA, CIRAD, FARA
January 2008	Press release – CTA website – Brussels Blog <a href="http://brussels.cta.int">http://brussels.cta.int</a>	Policymakers & development partners	EU & international	300/ day ; 63 000 unique visitors	CTA

**Section 2: Dissemination of the knowledge (continuation)**

<b>Dates</b>	<b>Type</b>	<b>Type of audience</b>	<b>Countries addressed</b>	<b>Size of Audience</b>	<b>Partner responsible / involved</b>
April 2008	Publication – Vertigo Clavel D, Barro, A, Belay T, Maraux, F, ' L'innovation agricole dans les zones sèches d'Afrique : le cas du Zai , technique traditionnelle au Burkina-Faso et de l'introduction d'une cactée dans la province du Tigray en Ethiopie	Scientists	SSA	CIRAD	CIRAD
April 2008	ARDEP Newsletter; 2nd Issue	General	Malawi	Undetermi ned	Ministry of Agriculture
July 2008	Bunda College Research Dissemination Seminar	General; Ministry of agriculture, NGOs, Pvt sector and other stakeholders	Malawi	200-250 participants	Bunda College Research and Publications Committee
October 2008	International workshop APPRI 2008 Learning, Producing and sharing Innovations: Tools for co- construction and sustainable implementation of innovations in Drylands Africa	General	ACP/EU	~ 50 people	CIRAD and CTA
March 2009	Press release – CTA website – Brussels Blog <a href="http://brussels.cta.int">http://brussels.cta.int</a>	Policymakers & development partners	EU & international	300/ day ; 63 000 unique visitors	CTA

**Section 2: Dissemination of the knowledge (end)**

<b>Dates</b>	<b>Type</b>	<b>Type of audience</b>	<b>Countries addressed</b>	<b>Size of Audience</b>	<b>Partner responsible /involved</b>
June 2009	Wageningen Student group presentation: Developing African-European partnership on Drylands research	Researchers, students, development practitioners	Netherlands	15 people	CTA
July 2009	Publishing AIDA project updates in all partner's websites	Researchers, academics, policymaker, development practitioners	International		All partners
September 2009	Presentation at RUFORUM /IFS Workshop - Developing Africa through Science, Technology & Innovation	Researchers, academics, policymaker, development practitioners	International	~200 participants	RUFORUM
October 2009	2 pages policy brief : "Investing in Africa's Drylands – Key Drivers of Success"	Researchers, academics, policymaker, development practitioners	International	Undetermined	All partners
October 2009	Parallel session at CTA Annual seminar 2009 : Role of Media in the agricultural development in ACP countries	General	ACP/EU	25 participants	CTA & all partners
December 2009	Erosion and restoration of degraded soils in the Niger Basin - compilation of technical advice sheets, French and English version	General	Niger	Printed version and published on project website	AGRHYMET CIRAD

### **Section 3 – Publishable results**

**Legend:**

Result description (product(s) envisaged, functional description, main advantages, innovations)

Possible market applications (sectors, type of use ..) or how they might be used in further research (including expected timings)

Stage of development (laboratory prototype, demonstrator, industrial product...)

Collaboration sought or offered (manufacturing agreement, financial support or investment, information exchange, training, consultancy, other)

Collaborator details (type of partner sought and task to be performed)

Intellectual property (IP) rights granted or published

Contact details

<b>Result description</b>	<b>Market applications or how might be used</b>	<b>Stage of development</b>	<b>Collaboration sought or offered</b>	<b>Collaborator details</b>	<b>IP rights granted or published</b>	<b>Contact details</b>
AIDA Database inco-aida@cirad.fr	Fields studies & Scientific knowledge  Public: researchers and development practitioners	In final process	Information exchange, training	AIDA Management team	no	clavel@cirad.fr
Article: Changements techniques et dynamique d'innovation agricole en Afrique Sahélienne: le cas du Zai mécanisé au Burkina Faso et de l'introduction d'une cactée en Ethiopie	Online revue vertigo.revues.org Scientific knowledge	Published in Vertigô, Vol 8, N°3, 2008	Information exchange, training	Clavel D, Cirad, France Barro A, INERA, Burkina Faso Belay T, Mikelle University, Ethiopia Lahmar R, Cirad, Burkina Faso Maraux F, Cirad, France	no	<a href="mailto:clavel@cirad.fr">clavel@cirad.fr</a> <a href="http://vertigo.revues.org/">http://vertigo.revues.org/</a>

Result description	Market applications or how might be used	Stage of development	Collaboration sought or offered	Collaborator details	IP rights granted or published	Contact details
Book: AIDA, Synthesis Report, International Conference On Agricultural Innovation in Dryland Africa, Accra, Ghana, 22-24 January, 2007 English & French	Fields studies & Scientific knowledge Public: researchers and development practitioners	Published in 2008, CTA (Ed), Wageningen, The Netherlands, 12 p.		Francis J, CTA, The Netherland Clavel, D, Cirad, France Verhagen, J, WUR_PRI DLO, The Netherlands von Kaufmann, R , FARA Wopereis M , AfricaRice, Ghana	no	Francis@cta.int
Poster: Innovations and learning processes in rural zones of Africa: interactive knowledge sharing gateways for sustainable social as well as technical progress. <i>Annex 3</i>	Fields studies & Scientific knowledge Public: researchers and development practitioners	Published: top ten winner poster's competition, Science Forum 2009, 15-16 June 2009, Wageningen	Information exchange, training	Clavel D, Cirad, France Andela C, Cosader, Cameroun Ouattara S, Jade Production, Burkina Faso Ndiaye O, CTA	no	clavel@cirad.fr
Report: Dryland parallel session on arid zones at CTA annual seminar Conference in Brussels (12-16 October 2009) <i>Annex 9</i>	Fields studies & Scientific knowledge Public: researchers and development practitioners	In progress (CTA editor)	Information exchange, training	Judith Francis, CTA Yodith Kebedé, CTA	no	Francis@cta.int

<b>Result description</b>	<b>Market applications or how might be used</b>	<b>Stage of development</b>	<b>Collaboration sought or offered</b>	<b>Collaborator details</b>	<b>IP rights granted or published</b>	<b>Contact details</b>
Commissioned student research project: “Developing African-European partnership on dryland research” <i>Annex 4</i>	Fields studies & Scientific knowledge Public: researchers and development practitioners	Report published	Academic training Europe and AFRICA	Judith Francis, CTA	no	Francis@cta.int
Book Guide: “Stakeholder in rural innovation in Dryland Africa” from APPRI Workshop, Ouaga, 21-24 Oct 2008) English & French <i>Annex 3</i>	Fields studies & Scientific knowledge Public: researchers and development practitioners	In progress ACP countries & International	Information exchange, training Sub Saharan Africa (SSA) and International	Danièle Clavel, Cirad, France Jenessi Matturi, CTA editions	no	clavel@cirad.fr
Report: Survey among policy makers ‘Why Invest in Africa’s Dryland ?’ <i>Annex 6.1 and 6.2</i>	Fields studies & Scientific knowledge Public: researchers and development practitioners	Published, ACP countries	Information exchange training SSA), ACP Countries & International	Judith Francis, CTA Yodith Kébedé, CTA	no	Francis@cta.org
Policy brief: Two pages policy brief: “Investing in Africa’s Drylands – Key Drivers of Success” <i>Annex 7</i>	Public: Researchers, academics, policymakers, donors, development practitioners	Published	Information exchange, training SSA, ACP countries and International	Judith Francis, CTA Yodith Kébedé, CTA	no	Francis@cta.org

Result description	Market applications or how might be used	Stage of development	Collaboration sought or offered	Collaborator details	IP rights granted or published	Contact details
Video: AIDA video ‘Why Invest in Africa’s Drylands ?’	Public: Researchers, academics, development practitioners policymakers	Video under production	Information exchange, training	Judith Francis, CTA	no	Francis @cta.org
Poster : <i>‘Perception paysannes des effets du Zaï dans la société Mossi du Burkina Faso.’</i> Selected for the CTA annual seminar 12-16 October 2009, Brussels, Belgium. <i>Annex 9</i>	Fields studies & Scientific knowledge Public: researchers and development practitioners 	Presented at the 2009 CTA annual seminar, Dryland session	Information exchange, training SSA, ACP countries & International	Rabdo, A, student Barro, A, INERA, Burkina Faso (BF) Lahmar R, CIRAD, BF Zougmore R, Inera, BF Clavel D, CIRAD, France Maraux F, CIRAD, France Dugué P, Cirad, France	no	altbarro@yahoo.fr
Communication: <i>‘Strengthen the knowledge and references on rehabilitation of degraded soils in the central plateau of Burkina Faso with the technique of mechanized Zaï’</i> Selected for CTA annual seminar, 12-16 October 2009, Brussels, Belgium <i>Annex 9</i>	Fields studies & Scientific knowledge Public: Researchers, academics, policymakers, donors, development practitioners 	Master memoir defended University of Paris XII, September 2008 Presented at the 2009 CTA annual seminar, Dryland session	Information exchange, training, SSA, ACP countries & International	Ms. Droux D, France (student) Barro A, INERA, Burkina Faso Zougmouré, R, INERA, Burkina faso Lahmar R, CIRAD, Burkina Faso	no	altbarro@yahoo.fr

Result description	Market applications or how might be used	Stage of development	Collaboration sought or offered	Collaborator details	IP rights granted or published	Contact details
<p>Communication: <i>'Study and analysis of the impact of Agricultural Holdings and Livestock Farms Located around protected areas: case of the 'W' Park of Niger'</i></p> <p>Selected for the CTA annual seminar' 12-16 October 2009, Brussels, Belgium.</p> <p><i>Annex 9</i></p>	<p>Fields studies &amp; Scientific knowledge Public: researchers Development practitioners</p>	<p>Master's degree in Concerted NMR defended University of Niger &amp; ARC Presented at the 2009 CTA annual seminar, Dryland session</p>	<p>Information exchange, training SSA, ACP countries &amp; International</p>	<p>Ms. Teresa Fernadndes Pereina de Veiga Tavares, Cape Verde Hamidou Djibo, ARC Niger  AGRHYMET-EIER-ECOPAS Project and University Bergamo</p>		<p>h.djibo@agrhyment.ne</p>
<p>Communication: <i>'The role of variety attributes on the adoption of dryland crop varieties: the case of pigeon pea production in Taita district, Kenya.'</i></p> <p>Selected for the CTA annual seminar' 12-16 October 2009, Brussels, Belgium.</p> <p><i>Annex 9</i></p>	<p>Fields studies &amp; Scientific knowledge Public: researchers, Development practitioners</p>	<p>Master memoir defended, University of Nairobi, faculty of Agriculture, Department of Agricultural Economics Presented at the 2009 CTA annual seminar, Dryland session</p>	<p>Information exchange, training, SSA, ACP countries &amp; International</p>	<p>Ms. Zipora Otieno, University of Nairobi (UoN), Kenya</p>		<p><a href="mailto:wmmuiru27@hotmail.com">wmmuiru27@hotmail.com</a> <a href="mailto:mwangombe@kenyaweb.com">mwangombe@kenyaweb.com</a></p>



Result description	Market applications or how might be used	Stage of development	Collaboration sought or offered	Collaborator details	IP rights granted or published	Contact details
<p>Communication:  <i>An assessment of Successful farmer Groups in land and water Management systems in Dry lands of Malawi: A case of Chinguluwe and Nkomba in Salima and Balaka Districts</i></p> <p>Selected for the 2009 CTA annual seminar' 12-16 October Brussels, Belgium.</p> <p><i>Annex 9</i></p>	<p>Fields studies &amp; Scientific knowledge  Public: researchers, Development practitioners</p> 	<p>Master memoir defended  University of Malawi, Bunda College, Lilongwe, Malawi</p> <p>Presented at the 2009 CTA annual seminar, Dryland session</p>	<p>Information exchange, training, SSA, ACP countries &amp; International</p>	<p>Mr. Mavuto Chagomerana  Mdulamzu, Bunda College, Malawi</p>		<p>mlozab@chanco.unima.mw</p>



Project number: contract N°: **FP6-043863**

Project Acronym: **AIDA**

Project title: **Agricultural Innovation in Dryland Africa**

## **FINAL REPORT**

### **Part 2 - Final Plan for Using and Disseminating the Knowledge**





Project number: contract N°: **FP6-043863**

Project Acronym: **AIDA**

Project title: **Agricultural Innovation in Dryland Africa**

Instrument: **INCO Specific Support Action**

Thematic priority: **Rational use of natural resources. Managing arid and semi-arid ecosystems**

## **AIDA FINAL REPORT**

### **Annexes**

Date of preparation: **April, 2010**

Start date of contract: **December, 26<sup>th</sup>, 2009**

Duration: **36 months**

Project Coordinator name: **Danièle Clavel**

Project coordination organisation name: **CIRAD**

# **AIDA FINAL REPORT**

## **List of Annexes**

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AIDA Final Report\_Annex6.1\_Survey report among policymakers\_CTA

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AIDA Final Report\_Annex7\_AIDA Policy Brief

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## CTA - AIDA Partner 8: Analysis of Case Studies : Success Stories in Africa's Drylands

J. Francis<sup>1</sup> & Y. Kebede<sup>2</sup>

### Introduction

The main goals of AIDA project were to:

- Deliver a comprehensive and critical assessment of initiatives for rural development in drylands of Africa
- Identify key drivers for success or critical analyses of failed interventions and to share this knowledge with all stakeholders involved
- Propose policy options for investments and sustainable development of Africa's drylands.

In order to achieve these objectives, CTA undertook an analysis of case studies that were identified as "success stories in Africa's drylands".

### Methodology

Before analyzing the case studies, a literature study was undertaken to provide definitions and identify criteria of "success". Based on this, a glossary was developed for classifying and analyzing the case studies. A total of 22 case studies were analyzed:

- Eleven case studies that had been selected out of 55 cases submitted for the first AIDA international conference "Agricultural Innovation in Dryland Africa: what are the key drivers for success" held from 22 to 24 January 2007 in Accra, Ghana.
- One case study from papers presented at the finals of the CTA/ATPS/AGRA/FARA/RUFORUM/NEPAD Young Professionals and Women in Science Competition, April 20-24, 2009.
- Nine case studies from UNEP's selection of success stories in land degradation-desertification control.
- One case study from FAO publication (Youdeowei, 2006)

### Glossary

Description: is related to the activities conducted within the case study.

Nature of the innovation: this section gives a typology of the innovation; which were grouped in three categories: social, technological or political/institutional.

Origin: Meaning the origin of the innovation as defined by having two possibilities: it can be indigenous or introduced. These two categories are further refined to reflect the real situation. In fact, the innovation can be indigenous but further developed or applied in a different way than the traditional one, or an introduced innovation can also be adapted to local habits.

<sup>1</sup>Judith Ann Francis, Senior Programme Coordinator, S&T Strategies, CTA & <sup>2</sup>Y. Kebede, Intern & Junior Consultant, CTA S&T Strategies, Programme.

Motive: driver of the innovation: The need for innovation is sometimes triggered by a crisis situation or an opportunity or by new knowledge or ideas. These triggers of innovation can be further identified as: demand, market opportunities and constraints, needs, challenges, competition, crises (food, energy and water shortage, climate change, epidemic diseases) (Daane et. Al., 2009)

Scale of adoption: It reflects the extent to which the innovation has spread; it is expressed at the administrative division level and/ or the number of beneficiaries or users. More specifically, how has it spread from individual to group to communities etc.

Communication interventions: reflects what the role of communication has been in the case study, taking into account horizontal as well as vertical communication. Communication is considered to be one of the main drivers of the innovation process as it enhances information and knowledge flows.

Policy interventions: reflects what the role of policy from local to international level has been in influencing or hindering innovation processes and the spread of innovations. Policy, like communication is also considered to be one of the main drivers of innovation processes.

Intervention of science and technology: reflects what role science (research) and technology played in the innovation process as science & technology are also considered to be important to the innovation process.

Impact: This reflects the economic, social and environmental benefits of the innovation.

Problem encountered and/or possible side effects: during the innovation process some difficulties can be encountered that are worth mentioning in order to learn from or anticipate and hence minimize these difficulties in up-scaling. In addition, even though an innovation can bring a number of benefits, some negative effects can occur and need to be mentioned.

### Can it be out-scaled?

For a successful innovation to be out- scaled, it was determined that a minimum of 7 out of 10 factors must be present and the factors are as follow:

1. Investments from government or farmers' / communities own resources
2. Participation or involvement of end-users, more specifically dryland people
3. Policy support
4. Communication, including farmer-to-farmer, partnership between different actors transfer
5. Ownership of the process
6. Derived environmental, social and or economic benefits – all three is a plus
7. Continuity of the process beyond the first intervention
8. Land tenure
9. Access to credits and inputs
10. Demand-driven or recognition of farmers' knowledge.

## **Results**

The detailed analyses of the case studies using the methodology applied demonstrated that only 18 of the 22 case studies could be out-scaled (See Annex). The diagram below demonstrates the requirements for success in Africa's drylands.

<sup>1</sup>Judith Ann Francis, Senior Programme Coordinator, S&T Strategies, CTA & <sup>2</sup>Y. Kebede, Intern & Junior Consultant, CTA S&T Strategies, Programme.

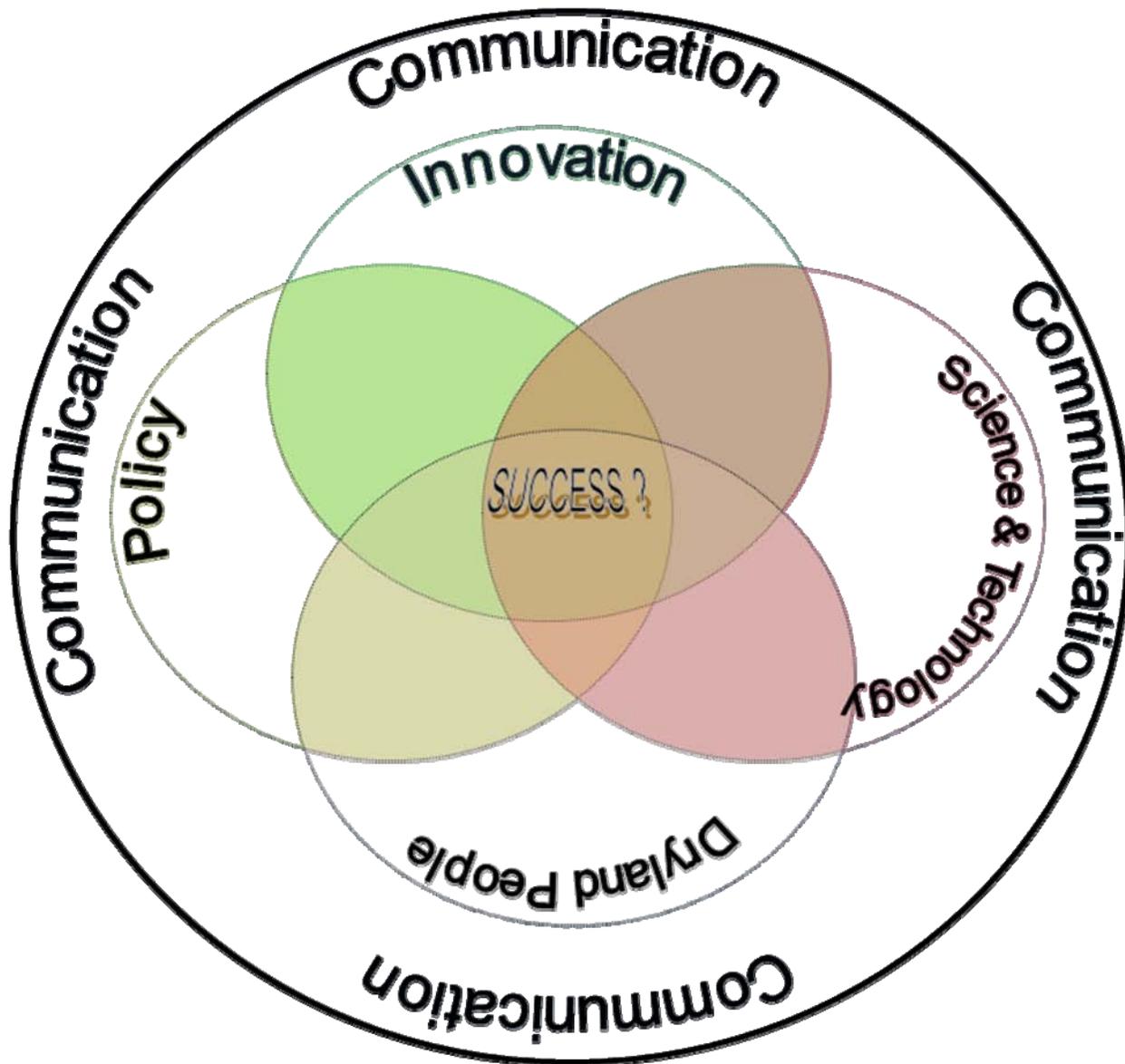


Diagram: How to achieve success in Africa's Drylands (Francis, J. & Kebede, Y., 2009)

## Conclusions

There are success stories in Africa's drylands which have resulted in economic and environmental benefits; however for the innovations to be up and out-scaled, there must be involvement of the dryland people and recognition and integration of their indigenous knowledge in research and policy formulation and implementation. The dryland people, the innovations, interventions of science and technology, and the policy framework, all embodied in an ongoing communication process whereby all actors can learn from each other, are therefore important for achieving success in Africa's drylands.

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<sup>1</sup>Judith Ann Francis, Senior Programme Coordinator, S&T Strategies, CTA & <sup>2</sup>Y. Kebede, Intern & Junior Consultant, CTA S&T Strategies, Programme.

												
CS Title – AIDA 2007	Description	Nature	Origin	Motive : driver of the innovation	Scale of Adoption	Communication Interventions	Policy Interventions	Intervention of S&T	Economic, social and environmental Impact	Problem encountered and/or possible side effect	Out-scaling Factors achieved	Can it be out-scaled? under which conditions
1) Adding Value to an abundant resource: cactus based development interventions in the drylands of northern <b>Ethiopia</b>	Expanding use of an exiting plant : Cactus ( <i>Opuntia ficus-indica</i> )	Social and technological	Introduced	Diversifying use of the cactus to mitigate food and feed shortage Utility for large purposes : human consumption, animal feed, cash income	Community to regional	Bringing attention and gathering all the information available on the plant (workshop) Technical cooperation with FAO Awareness campaigns by NGOs	MOU with FAO Regional government upgraded to strategic crop 5 year strategy developed	Validation	Economic: Expansion of income earning-opportunities Social: better livelihood conditions Environmental: regeneration of degraded soils	Invasive plant	1, 2, 3, 4, 5, 6, 7	<b>YES</b> Recognition of ‘ a strategic crop’ by the regional Government  Involvement of a large group of stakeholders along the all market chain
2) Dissemination and adoption of improved pigeon pea technologies among drylands communities in <b>Kenya</b>	Introduction of improved pigeon pea technologies varieties ( <i>Cajanus cajan</i> ) using a participatory method	Technological	Indigenous but improved varieties introduced by scientists	Decrease famine relief by using a crop which can increase cash income but which is also a rich source of protein	Communities	Participatory rural appraisal; farmers involved in identification of possible solutions and programmes; Farmer managed trials		Improved varieties’ Agronomic practices Demonstration sites	Increase of yields, palatability and marketability, farmers willing to extend the production		1,2,4,5,6, 7, 10	<b>YES</b> Assessment and evaluation of the farmers needs  Farmer-to-farmer transfer
3) Rehabilitation of Degraded soil in the central plateau of <b>Burkina-Faso</b> : a path towards sustainable agriculture	Introduction of labour saving technique (mechanized zaï) based on a traditional technology	Technological	Indigenous (manual zaï but improved technology introduced)	Challenged to produce under degraded soil, reduce labour requirement	20 villages in 2000 to 104 villages in 2007	Using farmers’ channels to disseminate information	Support of administration, customary structures	Introduction of new technology: mechanized zaï	Economic: Decrease labour requirement, gain of productivity Environmental : rapid effect on soil rehabilitation, improved yield Social: better livelihood conditions	First investment to buy the animal Soil depth Resources for animal feed Risk of higher differentiation between relatively rich and poor farmers	6, 4, 3, 5, 7	<b>YES</b> Joint action by farmers, NGOs, farmer organizations, and extension services with the support of administration and customary structures Availability of equipment, technical training, land tenure security
4) Run-off control and <i>Vitellaria paradoxa</i> parkland regeneration: effects on soil fertility and carbon storage ( <b>Mali</b> )	Soil degradation control using field arrangement along contour lines (ridges covered by natural grass)	Technological	Introduced but based on traditional practice	Control soil degradation due to run-off and overcome lack of water to ensure sustainability of farming	Communities	Farmers paid for contour lines and maintained them	In the respect of traditional land right	Introduction of new technique based on traditional practice	Increased crop yields and household income, increase of soil fertility and quality		1, 2, 5, 6, 7, 8, 10	<b>YES</b> Investment for the construction at the beginning and need of maintenance
5) Water-harvesting: a bottom-up approach towards sustainable productive land management systems in <b>Malawi</b>	In situ rainwater harvesting with participatory approach	Technological	Introduced	Increase rain-water use efficiency in dry areas	Communities	Participatory approach	_ Governance roles in resources management in respect of upstream and downstream effects _ participation of development agents	Implementation	Increase soil moisture and grain yields Increased production of irrigated crops Increased water availability in the fields Integrated management of surface run-off		1 (time, material and artisan skills of farmers), 2, 3, 4, 6,7, 10	<b>YES</b> Building up of ownership, confidence and capacity, recognition of upstream and downstream effects
6) Water-harvesting	Holistic and integrated water	Technological, social and	Introduced	Overcome chronic food-insecurity and	Communities	Participatory approach, capacity	_local institution building	Adaptation and implementation	Asset building, income diversification, access to	Less attention to other water	1, 2, 3, 4, 6, 7, 10	<b>YES</b>

**Annex – Analysis of AIDA Case Studies: Success Stories in Africa’s Drylands**

technologies in assuring food security: lessons from the pastoral areas of Somali Region, <b>Ethiopia</b>	management approach	institutional		water-related conflicts		building (schools around water points), building up of local institution			clean water, empowerment of women, recovery of degraded land, increase of biodiversity and seed and fodder banking, more concern for common resources	resources Challenges : expansion of settlement around water points and community dependence on the technology		
7) Farmer-Managed natural regeneration in Niger’s Zinder Region: a case study of success ( <b>Niger</b> )	Assessment of Farmer-managed natural regeneration and integrated productions systems	Social	Indigenous (Farmer’s initiative	Reaction after 2 environmental crisis experienced	Region level	Farmer’s initiative		Validation	Better integration of crops, livestock and trees Generation of income, reduction of wind erosion and dust storms, women spend less time collecting firewood, reduction labour migration		2, 5, 6, 7, 10	<b>YES</b> But result from farmer’s initiatives reacting to experienced environmental crisis Might be context specific
8) Farmer’s participation in improved soil and water management technologies: experience from northern <b>Tanzania</b>	Guiding and informing farmers to identify and select appropriate soil fertility and management practices	Technological and social	Introduced	Reaction after a severe land degradation situation	360 farmers	Participatory methods	Main author = from ministry of Agriculture	Test and adoption	Better soil and crop management, productivity improvement, change of attitude on the part of farmers and researchers	Lower participation of women farmers	1, 2, 4, 5, 6, 7, 10	YES
9) People, livestock and wildlife: best practice cases in Samburu and Laikipia districts of northern <b>Kenya</b>	Concerted conflicts management	Social	Introduced by African Wildlife Foundation (AWF)	Conflicts for water and pasture, population pressure	Districts	Strategic planning workshop, partnership creation with communities, country councils, researchers, conservation groups,	Country councils	Concerted strategies choices and implementation	Incorporation of wildlife into communally owned livestock ranches, wildlife-based tourism enterprises		1, 2, 3, 4, 5, 6, 10	<b>YES</b> Find a balance between use of pasture land for livestock production with wildlife
10) Inter-organizational platform to support the development and adaptation of integrated soil fertility-management (ISFM) innovations in farmer communities in <b>Niger</b>	M&E system, interactive mutual learning processes and collaborative interventions to develop ISFM	Technological and social	Introduced	Need of novel solutions to overcome persistent drought, low soil fertility and acute poverty, achieve sustainability of the natural resource base along with social change	30 to 470 farmers between 1996 and 2004, networks , farmer associations	Conventional on-farm trials, to inter-organizational platforms through participatory approaches  Farmers level to networks, performance of farmer associations and co-coordinated actions	Use of inter-organizational platforms to address issues of credit and inputs	Implementation and development	Improved agricultural productivity and farm incomes  Increased livelihood options	Continuous adaptation of the dynamics of innovation process to the nature of farmer’s livelihood	1, 2,3,4,6,7, 10	<b>YES</b> Access to credit and inputs
11) Monitoring and evaluation of environmental degradation in arid and semi-arid regions: Butana area, <b>Sudan</b>	Use of satellite imagery to monitor natural resource and mapping of land degradation	Technological	Introduced	Observation of a decrease of rainfall	Research level	Use of satellite imagery		Monitoring	Information collected could be used for interventions and organization of land use and water-point sites		6 (if results applied)	<b>NO</b> How to make this collected information to the application in the field?
12) Farmer-Breeder partnership in Barley Varietal Selection: A case for decentralized plant breeding in drought-prone areas of Northern <b>Ethiopia</b>	Identification of varieties adapted to low-input environments in partnership with farmers	Technological and social	Indigenous further developed with intervention	Barley important staple cereal crop for the area, failure of adoption of public breeding of barley by farmers, need of improving existing variety	Household-level to communities	Focus-group discussions Participatory evaluation, assessment of household preferences Diffusion of results to farmer communities, policy makers and scientific community	National and regional policy makers assisted to an exhibition of results of farmers experimenters  Authorities agreement for release of the variety	Complete hand in hand work of researchers with farmers	Development of an appropriate barley variety adapted to the environment conditions and farmers’ preference  Formation of a spontaneous association by farmers		1, 2, 3, 4, 5, 6, 7, 10 (social and economic benefits)	<b>YES</b>

Annex – Analysis of AIDA Case Studies: Success Stories in Africa’s Drylands

Oasis case studies	Description	Nature	Origin	Motivation : driver of the innovation	Scale of Adoption	Communication Interventions	Policy Interventions	Intervention of S&T	Impact	Problem encountered and/or possible side effect		Can it be up-scaled? With which conditions
13) Soil and Water Conservation in Illela District, Niger	Simple water harvesting techniques: stone bonding, zaï Not a systematic food-for-work incentive but rather community infrastructure and tools-for-work	Technological and social	Indigenous	Water shortage	From Illela district to adjacent districts to other parts of Niger	Study tour by farmers to Yatenga region in the Central Plateau of Burkina-Faso.  Spontaneous diffusion of improved plating pits		Shift of the zaï from simple planting technique to water harvesting and soil fertility management technique (shift not envisaged in the original project design)	9000 ha barren and crusted land have been treated (= 15% of the cultivated area)  A market developed for barren and crusted land  Economic rate of return of 20%		1(farmers work), 2, 4, 5, 6,7, 10	<b>YES</b>  Challenge : land tenure problems especially for collective land management
14) Niger : the integrated Rural Development Project in the Keita Valley	Land degradation control projects Example of a non “right-sized” project	Technological and social	Introduced	To overcome serious problems of land degradation	District level : Keita district	Training of more than 100 000 people 148 Women groups of saving and credit association with more than 10 000 members	Certainly need of the agreement of district and state authorities for implementation of such a big project	Training in soil and water conservation techniques Construction of different kind of water harvesting technologies	Restoration of the productive capacity of 20000 ha  17 million trees plated 133 ha sand dunes fixed, 40 small dams and 300 km of rural roads, public infrastructure constructed	Non-sustainability of the project	1 (large amount of investment, but not clear if governmental or donor funded) 4 (mainly under training form) 6 (environmental and economical, social aspect seems not taken enough into consideration due to lack of end users involvement)	<b>NO</b> Need of right-sizing the project  Heavy investment project (63 million \$ + 12 million food rations valued at 12 million\$)
15) Mali : Office du Niger large-scale gravity irrigation	Large-scale gravity irrigation scheme set up in 1932, failed then rehabilitated	Technological	Introduced	Rehabilitation of a large irrigation scheme for regional development	National	Involvement of farmers in water fee determination, management and maintenance of the irrigation schemes	Before reform: government control of production, milling and marketing in combination with tenure insecurity  After reform (1988): more decentralized management and liberalization of rice milling and marketing	Diversification of production with introduction of dry seasons crops  Change in the scheme, maintenance management, farmers involved in water fee determination	Paddy yields increased from 1.5 tons/ha before reform to 5,5 tons/ha after reform  Increase of water fee collection, Expansion of the irrigated area  Increase of rice revenue	Before 1990 poor maintenance of irrigation infrastructure	1, 2, 3, 4, 5, 6, 7	<b>YES</b> Involvement of farmers in management committees
16) Nigeria : small-scale valley bottom irrigation with shallow pumping	Fadama development : coordinated approach to agricultural and rural development	Technological	Introduced	To increase crop production through coordinated approach to rural development	Northern Nigeria	Very top-down, press on fuel based water pumps		Introduction of first large diesel pump sets (little demand), shift to shallow tube wells and wash boring	10 000 tube wells drilled, 65 000 gasoline-powered pumps, 100 000 ha irrigated, diversified crop production, development of new service : maintenance of pumps and wash bores	Project had no livestock component, creation of herder/ farmer conflicts due to non-respect of previous indigenous rules and organizations  Extraction from shallow aquifers disturbing water balance	Economic benefits but projects lack to involve end-users demand and participation	<b>NO</b> Very difficult or even impossible to out-scale this specific project : too dependant on fuel availability, non demand-driven
17) Forest resources management in Tanzania	Building on traditional practice of natural resources and make them recognized by national policies	Political	Introduced for Indigenous knowledge dissemination	Strengthen national institutions responsible for forests and lands	11 regions to national level (impact of policies)	Increasing awareness of villagers on land and forest management policies, implicate them in policy	Shift in the national land policies, new forest policy, share benefits and responsibilities of management of	Generation of information : mapping vegetative cover, policy studies, technical support to	Favorable access to land for villagers, land titling , more consensual management leading to more sustainable		1, 2, 4, 5, 6, 7, 8	<b>YES</b>

Annex – Analysis of AIDA Case Studies: Success Stories in Africa’s Drylands

						formulation Advising villagers on policies over common lands, protection strategies, implicate villagers in the regulation of land access and use	government forest reserves	institutions for land registration and tilling	use of forests resources Empowerment of village communities to manage natural resources			
18) <b>Niger</b> household energy project	Vesting firewood supply responsibilities in local communities and rationalizing trade through licensing and taxation	Technological and Institutional	Introduced	Reduce pressure on the forests Restructure fuelwood supply	Niamey surrounding	Promotion of the use of more efficient wood stoves and substitution of kerosene by firewood with appropriate pricing	Non support from forest department	Encouraging behavior change related to energy use	Assessment after 5 years showed an unchanged number and turnover of markets, similar share of these markets in total firewood supply, big variation in performance of individual markets	Confiscation of forest management funds coming from sales proceeds by forestry department  Risk of coming back to firewood use if the substitutes are not easily accessible  No valid monitoring of ecological impact		<b>NO</b> Need of policies and governance support to enable the firewood market strategy to thrive  Consideration of woodlands solely in terms of firewood is too narrow and do not consider the multiple use and users of this resource  Need of radical change in forest tax policy
19) Reforestation in Tigray, <b>Ethiopia</b>	Area enclosures and community woodlots for environmental rehabilitation	Technological	Introduced	To rehabilitate degraded lands	50 <i>tabias</i> ( ~ 250 villages) in Tigray region	At village council level for management of the woodlands	Tree harvesting is not allowed by Ethiopian legislation		9 over 10 <i>tabias</i> have woodlots with an average size of 8ha  Woodlands are managed by each village council  Value of trees constitute wealth of communities		2, 4, 5, 6 (social and environmental), 7	<b>YES BUT</b> Might be a need for reviewing this policy and adapt it to local situation  Common uses of the woodlands are limited to grass, fruits and seeds collection and beekeeping so benefits are still limited as the wood harvesting is not allowed
20) Livestock and pasture Development in <b>eastern Morocco</b>	Build intertribal consensus on the use and improvement of rangelands Grass-roots cooperatives based on ethnic lineage and ancestral rights	Social and political	Introduced	Crucial need of overcoming drought and degradation causing heavy losses to sheep-raising communities	3 regions of 3 million ha	Intertribal consensus building	Compensation paid in the form of barley an feed concentrate for not using set aside area	Consensus building strategy	34 cooperatives formed in 5 years with total membership of 8 250 people  450 000 ha set aside by cooperatives  Quick regeneration of plant cover and fodder production		1, 2, 4, 5, 6, 7, 10	<b>YES</b>
21) <b>Kenya:</b> Arid lands resource management project	Micro-project in water, animal and human health, and education and drought early	Technological and social	Introduced	To strengthen the capacity of affected communities to cope with drought	From pilots in some districts to national level	Strong participatory approach (from design to implementation of the project)	Transport subsidy to enable livestock to be sold at the onset of a drought	Intervene to reduce risks of drought using all kind of preventions systems	Project has improved drought preparedness and responsiveness, conflict resolutions	Project did not bring improvement in range management	1, 2, 3, 4, 5, 6, 10	<b>YES</b> Need of “trusted intermediate” Need of policy intervention for

**Annex – Analysis of AIDA Case Studies: Success Stories in Africa’s Drylands**

	warning system					Important position of an NGO as a “trusted intermediate”		Lack in communicating to communities the funding mechanism inducing	Positively perceived at national and district level but nuanced perception at community level  Unclear effect on poverty reduction	practice		equitable resource distribution
22) Farmer innovators Promoting Integrated Agricultural Production Intensification systems : The PRODS/PAIA Story in <b>Burkina-Faso</b>	Implementation of integrated agricultural production systems intensification by FAO	Technological, social and institutional	Introduced but based on local capacities	To promote wide-scale farmer adoption of the integrated agricultural production systems intensification concept to achieve improved and sustainable rural livelihoods To promote holistic system approach and better address the socio-economic dimensions	From 5 villages to national level	Stung participation of farmers, collaboration and partnership with national and regional agencies, NGOs, civil society and private sector	All levels of governmental agricultural agencies involved in development, appraisal, implementation and promotion of strategies and appropriate technologies	Large amount of activities addressing issues of policy, technical and human dimensions of agricultural production systems	Economic, social and environmental benefits		1,2, 3, 4, 5, 6, 7, 9, 10	<b>YES</b>

The factors for out-scaling:

1. Investments from government or farmers’ / communities own resources
2. Participation or involvement of end-users
3. Policy support
4. Communication : including partnership between different actors, including Farmer-to-farmer transfer
5. Ownership of the process
6. Derived environmental, social and or economic benefits – all three is a plus
7. Continuity of the process beyond the first intervention
8. Land tenure
9. Access to credits and inputs
10. Demand-driven or recognition of farmers’ knowledge

## TEMPLATE OUTLINE FOR DOCUMENTATION OF CASE STUDIES

### 1. Title of the initiative

### 2. Details of the AIDA main contributor (s): Name, Organization, N° of AIDA Partner, E-mail

### 3. Nature and origin of the innovation

- Social, technological, institutional
- Introduced, indigenous, mixed

### 4. Context

- Location : country or region of the initiative, specify rainfall
- Field of involvement of the Initiative/Innovation
- Initiative start date, main steps and, if applicable, the finishing date

### 5. Background of the initiative/innovation

- Motive /driver of innovation: the reasons for carrying out this initiative: earlier initiatives, changes in context, etc.

### 6. Objectives of the initiative

### 7. Initiative description

- Partnership (internal):describe the project governance, participation of beneficiaries and other actors (qualification and number)
- Method used for implementation : theoretical and methodological principles and references used
- Main actions: from planning to implementation
- Capacity enhancement actions: mention training and co learning implemented
- Scale of adoption / uptake of the innovation (dynamic)
- Resources: indicate Aida funds, others donors and financial contributions of partners

### 8. Main outputs

### 9. External drivers

- Communication focus: indicate what has been the role of communication and which would be the major aspect to highlight for future communication
- Policy intervention: indicate what has been the role of policy local to international and what are the needs in terms of public policies to ensure scaling
- Science and Technology inputs (indicate major input from scientific research)

### 10. Expected outcomes

- Current or planned or activities for up scaling: mention the existing partnership (external)

### 11. Appraisal

- Was a formal appraisal conducted for project relevance?
  - If yes: explain the method and criteria used and problems encountered if any?
  - If no: Explain the method and criteria used and problems encountered if any?

## **12. Impact**

- What impacts did the project have for the partners, on the development of the region, or country?
- What criteria were used to measure it (qualitative, quantitative, in terms of sustainable development?)

## **13. Prospects for out-scaling**

- What are the prospects and requirements for it to be out-scaled (i.e., to spread locally to neighbouring communities): indicate the main factors in the list of 10 factors<sup>1</sup>
- Knowledge gaps (in terms of S&T, capacity, communication tools..)

## **14. Keywords**

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<sup>1</sup> Extract from CTA Glossary list : 1)Investments from government or farmer's/communities own resources, 2) participation or involvement of end-users, 3) policy support, 4)Communication including Farmer-to-farmer, partnership between different actors transfer, 5) Ownership of the process, 6) Derived environmental, social and economic benefits, 7) Continuity of the process beyond first intervention, 8) Land tenure, 9) Access to credits and Inputs, 10) Demand-driven or recognition of farmer's knowledge

## Innovations and learning processes in rural zones of Africa: interactive knowledge sharing gateways for sustainable social as well as technical progress



The analysis of recent food crises in Sahel Africa, has shown that they were not due to major failings in agricultural production. These famines, have contributed to a renewed vision of the contribution made by agricultural research to development. Today, agricultural science needs to reach beyond this sector in order to incorporate studies into the economic, social and cultural contexts of rural areas. That new paradigm assigns a central role to technical and institutional innovation defining it as a learning process and designed to find new solutions to societal issues. The approaches promote a negotiated construction, right from the outset, between all the stakeholders involved. The food challenge in Africa therefore means strengthening the abilities of all stakeholders in the rural world to express a proper demand to solve their problems. This great challenge will necessarily involve the development of novel approaches and of learning and communication tools that will call upon new technologies whilst respecting the cultural context. Two examples of co constructed initiatives that have helped to improve access to relevant information making it possible to enhance the impacts of an innovation on society are presented.

■ **The first initiative** is the citizens' anti-hunger caravan (la caravane citoyenne contre la faim) set up by an NGO group from Cameroon ([www.cosader.org/](http://www.cosader.org/)) to improve rural livelihood, as a strategy to mobilize all stakeholders in rural areas. The initiative helps to improve population access to information, particularly on communal development policies. Information is passed from village to village, enabling collective mobilization of the communities as a force for proposals in defence of their interests.



Animation and exchange on the agricultural services, with young agronomist graduates, December 2008, Yaoundé (Cameroon) (Photo COSADER)

The creation of a forum for dialogue and exchanges on agricultural training and information services, and the establishment of a rural women's platform to improve access to training through communication and scientific information, are among the activities recently backed by FAO and the Chamber of Agriculture from Cameroon.



FAO, COSADER, Agriculture Chamber dialogue's day with the rural women (Oct. 2008, Bafoussam (Cameroon) (Photo COSADER)

■ **The second initiative** concerns the CTA's rural radios programme (<http://ruralradio.cta.int/>) which is based on a network of professional journalists working in nine French-speaking African countries. Rural Radio Resource Packs have been produced in collaboration with the African journalist's network, Jade Production, with backing from the "Francophonie" and the European Community. The work under way involves the production of community radio programmes and participatory management of content.



The main challenge remains to mobilize funds and train stakeholders and beneficiaries, in order to guarantee the perpetuation and scaling-out of achievements.

Clavel, Daniele (CIRAD), Andela, Christine (COSADER), Ouattara, Souleyman (JADE) and Ndiaye Oumy (CTA)



## Making dryland research matter

Addressing the need for European-African partnership for Ethiopia and Niger

---



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**Date:** 24-June-2009

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## Foreword & Acknowledgements

This project was undertaken for the Technical Centre for Agricultural and Rural Cooperation EU-ACP (CTA), a partner in the Agricultural Innovation in Dryland Africa (AIDA)<sup>[1]</sup> project, by a multi-disciplinary team of graduate students of Wageningen University. The report was prepared as part of the Academic Consultancy Training course. The goal of the course is to gain experience in applying academic skills in a small consultancy team. That is not to say that the team considered this to be just a training exercise. Every team member was highly motivated to make this report something that not only we, but also our commissioner and Wageningen University can be proud of.

We could not have performed this assignment without the support of a large number of people. We would very much like to extend our gratitude to each of these persons: Judith Ann Francis and Yodit Kebede, CTA. Their confidence in the outcome of this assignment was heart-warming, and a real boost to the team; our process coach, Sara Eeman, who made the difficult task of working in a multi-cultural, multi-disciplinary team an enjoyable and productive experience; the experts assigned to our team for this course; Tjeerd-Jan Stomph and Nico de Ridder: their input and critical feedback really helped us to produce results; Marloes van der Kamp for evaluating our proposal; Marjan Wink for her communication training sessions; and all the experts in the field who were eager to meet us and provide invaluable input: Dr. Todd Crane, Prof. Dr. Ir. Han van Dijk, Prof. Dr. Ir. Ken Giller, Dr. Ir. Jan de Graaf, Dr. Ir. Tjeerd-Jan Stomph, Prof. Dr. Ir. Akke van der Zijpp, Dr. Ir. André de Jager, Dr. Chris Reij, Wim Goris, Djibo Hamidou, Dr. Wellington Ekaya, Dr. Fetien Abay and Tesfay Belay. Without the input of these experts we would have been overwhelmed by the amount of issues facing African dryland farmers.

We hope reading this paper will be as pleasant as writing it was,

ACT Group 545,

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## Executive summary

Dryland Africa is faced with many challenges, like water shortage, food crisis, erosion, land degradation and desertification. Concerns exist on the contribution of research to the solution to these challenges: farmer knowledge might be underappreciated and duplication and contradiction might be present in the policies and interventions. In order to address these issues, the following questions are answered in this text:

1. How to bring the knowledge at field level into research programmes?
2. Is there a need for harmonization of policies and interventions in the field?
3. How to set up a more concerted network between policies, research programmes and interventions in the field?

These questions will be answered using literature research, analysis of policy documents, and interviews with experts.

The policies of different actors are examined: International research organisations such as ICRISAT, ICARDA, ICRAF and ILRI; National government policies of Niger and Ethiopia; and several donors and NGOs such as DANIDA, USAID, GTZ, IFAD SOS Sahel and the Eden Foundation. It is argued that the level of farmer participation in dryland research is currently too low. Policy implementation is conducted in a top-down manner. Farmer concerns and perceptions are therefore not adequately fed into the research system. The fact that public funding is low exacerbates this fact, and preordains thorough cooperation between actors in order to use resources efficiently.

The following answers to the questions are proposed:

1: In order to get farmer knowledge in research participative methodologies are needed. Although some progress is made in this, there is still a long way to go.

2: Several policies affecting dryland farmers contradict. Land tenure policies are not always compatible with policy priorities regarding off-farm employment and farmer investment in soil and water conservation measures. Policy also often under-acknowledges the links between the different issues dryland farmers face. Focusing on one of these issues in isolation might be one of the causes of past dryland intervention.

3: Networks of stakeholders are needed to provide an environment conducive to innovation and experimentation. These networks should combine actors operating at different levels, so the inherent tension between the need for locally specific innovations and region-wide solutions can be taken away.

It is concluded that participatory methods are vital, in order to set a research agenda that addresses farmers' concerns and needs. These methods should be supported by a network of supportive policies allowing the dissemination of knowledge and innovations.

Some limitations were encountered during the writing of this report. Not all information on the topic could be addressed; either due to language difficulties, to documents simply being unavailable or people not responding to questionnaires. Policy documents of Ethiopia were so numerous, that a selection had to be made which to consider for this report. A further problem was that the team does not consist entirely of specialist in the field of dryland agriculture. There is therefore only a limited frame of reference in order to assess whether all crucial topics have been covered.

Some recommendations for further research are to interview farmers, use specialist with proficiency in French, and to do more research on to how policies are implemented, rather than how they are worded in documents.

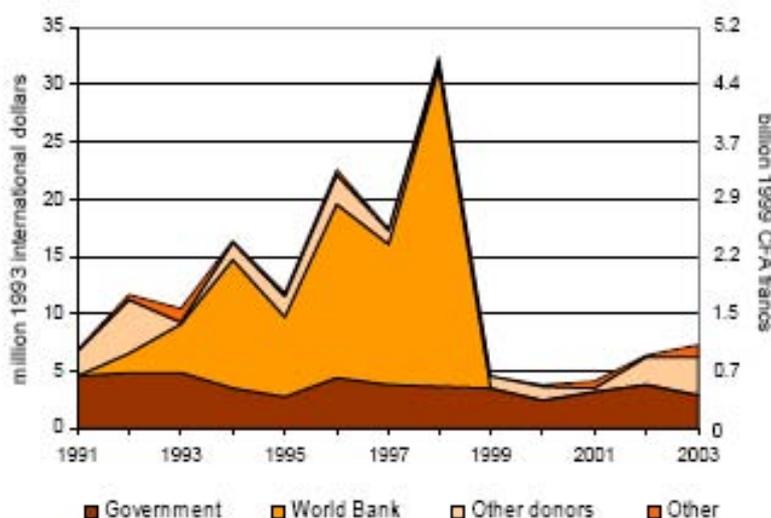
# 1. Introduction

While large parts of the scientific literature and popular debate depict agriculture in dryland Africa as failing, this is a one-sided depiction of a reality that is diverse and dynamic. For the past 40 years commentators have predicted food crisis in the drylands of the continent. However, despite difficult circumstances, the value of agricultural output has risen by 2.7% annually. However, in a region where population growth rates are among the highest in the world, this has not been enough to effect a rise in per capita food production (Haggblade et al., 2003). Several factors contribute to this; Africa's soils are generally poor, rainfall is low while there is little scope for large scale irrigation, and the climate is very erratic (Haggblade et al., 2003). This makes it hard to copy the successes that have been made in for example irrigated rice, in Asia.

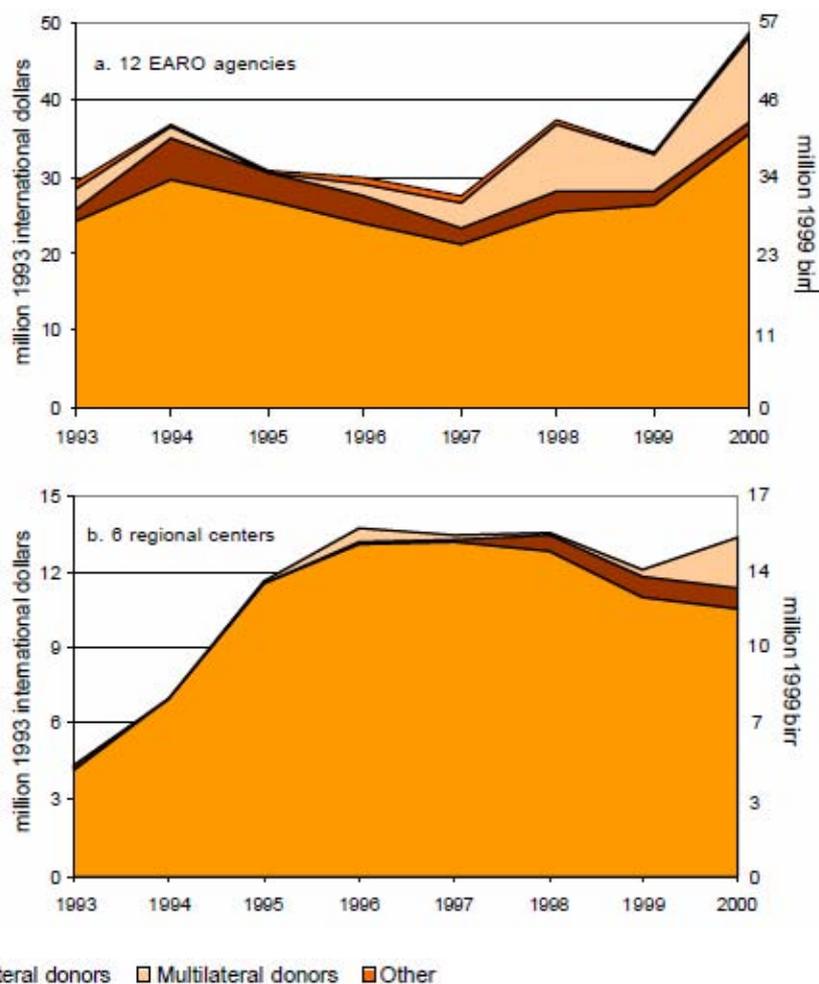
This report aims to provide an overview of the research efforts currently underway in dryland Africa. The actors that engage in this research are very diverse; International research institutions, donor organizations, NGOs, national governments and their agricultural research systems all have their policies affecting this research. Farmers themselves also innovate and experiment with ways of coping with the difficulties of dryland agriculture.

In order to keep the amount of policies studied manageable, the focus of this research will be on Niger (excluding irrigated areas) and the dryland regions of Ethiopia (Somali, Afar Tigray and parts of Amhara). Both provide interesting case studies, due to their experience with food crises. The fact the countries are located in different regions allows a comparison to be made. This will help in identifying what policies and interventions deserve replication, and which ones need to be altered.

These two countries share a few characteristics; both rank near the bottom of the United Nations Development Fund's Human Development Index (UNDP, 2008). Their economies are for a large part reliant on subsistence agriculture, and food security is a serious issue for both. However, for every \$100 of agricultural output, the Nigerien government invested \$0.17 in research in 2001, while the Ethiopian government did a little better at \$0.43 (in 2000), however, this is still low compared to the average ratio of Africa, 0.85 (Stads et al., 2004; Beintema and Solomon, 2003). Figures 1 and 2 depict the development budgets allocated to agricultural research over a number of years. Here too, diverging trends between the two countries are apparent; while in Ethiopia budgets are steadily increasing, Niger's show a sharp drop. The reasons for this drop are beyond the scope of this paper now, however, it is noted that this drop has been detrimental to agricultural research.



**Figure 1:** Funding of Niger's Agricultural research institute, INRAN. Notes: "Other" includes internally generated income, contributions from private enterprises, and non-identified sources of income. INRAN's funding levels are lower than its expenditure levels because estimated salaries for expatriates are not included. (Source: IFPRI-ISNAR-CORAF/WECARD 2002-03).



**Figure 2:** Funding to Ethiopia's agricultural research system. (Source: IFPRI–ISNAR–ASARECA 2001–02).

One of the concerns this report aims to address is the way farmer knowledge is incorporated into research programmes. Research used to be very top down: research stations transferred their results to extension workers, who pass it on to farmers. Given the agricultural budgets described above, researchers have been spread so thinly, that it has proved impossible for them to be fully aware of what is going on “on the ground”. This has meant that the “transfer-of-technology” model does not deliver the innovation required. Nevertheless, science is seen as the primary source of innovation. This is unfortunate, as experimentation and innovation by farmers has great potential to increase food security in Africa (Kaboré and Reij, 2004; Reij and Smaling, 2008). Agroforestry and soil-conservation techniques that are labour- rather than cash-intensive are being adopted and adapted by local communities once their effectiveness has become clear. A “regreening” has been described for millions of hectares in Niger (CP Reij 2009, pers. comm., 3 June).

A second concern this report addresses is that the policies of the multitude of actors described above might not always coincide, and sometimes contradict. It is argued that in order to provide an environment that is conducive to innovation and experimentation, different stakeholders need to be engaged, and multi-disciplinary co-operation is needed (Clark, 2001; Hall et al., 2001).

In order to address these two issues, the following questions are answered in this report:

4. How to bring the knowledge at field level into research programmes?
5. Is there a need for harmonization of policies and interventions in the field?
6. How to set up a more concerted network between policies, research programmes and interventions in the field?

This report is organized as follows: Chapter two details the methods used for this report. Chapter three will give an overview of the actors, and their policies. Chapter four consists of a critical reflection of these policies. Answers to the questions posed above are provided in chapter five. The concluding three chapters consist of a discussion, conclusions and recommendations for further research.

## 2. Methods

This report relies on three types of information; policy documents of stakeholders, scientific literature and expert interviews.

The actors whose policies were scrutinized include the national governments of Niger and Ethiopia; their national agricultural research institutes; international agricultural research institutes, ICRISAT, ICARDA, ICRAF and ILRI; Donor organizations, EU, USAID, DANIDA, IFAD and GTZ; and NGOs, such as SOS Sahel, TerrAfrica, Eden foundation and FARM-Africa. In order to assess the policies of these actors, their websites were searched for relevant documents, such as strategy papers, annual reports, and policy reports. The focus while searching for these was on dryland issues. After these were defined very broadly, some restrictions had to be made, as practically all government policies affect dryland people in one way or another. Therefore, when available, the policies (e.g. from national governments) examined, address agricultural research, agricultural technology development, extension and land tenure.

The assessment of scientific literature served two purposes: the first was to provide context and critical reflection on the policies found, in order to get an independent opinion of the policies and interventions of actors in the field; a second aim was to assess different theories on innovation, and whether the assumptions underlying the policies were shared in the scientific community. To start, CTA gave us a collection of articles that provided at least an introduction to dryland research.

To interview experts, key persons of different disciplines were selected (with suggestions from CTA) with experience in research in dryland Africa, preferably Niger and/or Ethiopia. Questions were asked regarding the issues affecting the drylands, the gap between field and research and how to close this gap. Because we selected experts with experience in Africa, several stayed actually in Africa during the time of this study, and could not be met face-to-face. These people were either contacted by phone, or by an e-mail questionnaire. The summaries of the interviews and answers to the questionnaires can be found in Annex A and B.

From Wageningen University the following resource persons are interviewed,

Dr. Ir. Todd Crane, Technology & Agrarian Development;

Prof. Dr. Ir. Han van Dijk, Law & Governance in Africa;

Prof. Dr. Ir. Ken Giller, Plant Production Systems;

Dr. Ir. Jan de Graaf, Land Degradation and Development;

Prof. Dr. Ir. Akke van der Zijpp, Animal Production Systems.

The following three resource persons from outside Wageningen University are interviewed:

Dr. Ir. André de Jager, LEI, Agricultural Economics Research Institute, Market & Networks;

Mr. Chris Reij, Centre for International Cooperation, Vrije Universiteit;

Wim Goris, Agri-ProFocus (partnership of Dutch donor agencies, credit institutions, companies, training and knowledge institutions).

CTA selected 11 key persons to send a questionnaire to, 4 people provided answers: Djibo Hamidou (AGRYMET), Dr. Wellington Ekaya (RUFORUM), Dr. Fetien Abay (Mekelle University, Ethiopia) and Tesfay Belay (Tigray Agricultural Research Institute, Mekelle, Ethiopia).

Our expert to supervise the content of this project was Dr. Nico de Ridder of Plant Production Systems. Two meetings were organized about the content, and he is one of the examiners of this report. Finally, one of our commissioners, Yodit Kebede attended two of our meetings to give feedback and input.

### **3. Exploration of existing policies**

This chapter gives an overview of the policies of important actors in dryland Africa. First the international research centres are examined. This is followed by an overview of the policies of the Ethiopian and Nigerien governments, focusing on the policies most relevant for dryland issues. The national agricultural research institutes of Ethiopia and Niger are located in the government part because their policies must fit with those of the government. The final part contains an overview of the policies of a selection of NGOs that operate in drylands of Ethiopia and Niger.

#### **3.1. International Research Centres**

Starting at the international level there are 15 research centres that belong to the Consultative Group on International Agricultural Research (CGIAR). The CGIAR members all have research mandates related to specific commodities and geographical areas. Four research institutes that are most relevant for the dryland areas in Ethiopia and/or Niger have been selected. The main focus of their research is outlined here. First, a short description of the International Centre for Agricultural Research in the Dry Areas (ICARDA) is presented, followed by the International Centre for Research in Agroforestry (ICRAF), the International Crops Research Institute for the Semi-Arid Tropics (ICRISAT), and lastly the International Livestock Research Institute (ILRI).

##### **3.1.1. International Centre for Agricultural Research in the Dry Areas (ICARDA)**

For developing countries in general ICARDA works on the improvement of barley, lentil, and faba bean. Specifically for the dry areas they are concerned with on-farm management of water, improvement of nutrition and productivity of small ruminants (sheep and goats), and rehabilitation and management of rangelands. In the Central and West Asia and North Africa (CWANA) region, ICARDA is engaged in the improvement of durum and bread wheat, chickpea, pasture and forage legumes and farming systems (ICARDA 2009a).

ICARDA's research is concentrated into four areas: (a) integrated gene management, (b) production systems, (c) natural resource management, and (d) social, economic and policy research. In its Medium Term plan (2008-2010) these are focused into eight projects (ICARDA, 2007):

Project 1: Conservation of Agrobiodiversity in Dry Areas

Project 2: ICARDA-CIMMYT Wheat Improvement Program for CWANA

Project 3: Barley Improvement

Project 4: Food Legume Improvement

Project 5: Strengthening National Seed Systems in Dry Areas

Project 6: Diversification and Sustainable Intensification of Production Systems in Dry Areas

Project 7: Improving Water and Land Management in Dry Areas

Project 8: Poverty and Livelihood Analysis and Impact Assessment in Dry Areas

For the Nile Valley and Sub Saharan Africa region (Egypt, Sudan, Ethiopia, Eritrea and Yemen) the incorporation of wheat leaf rust resistant genes into high yielding wheat cultivars is mentioned as key achievement. ICARDA also mentions the sharing between countries of resistant races of wilt and root-rot disease in food legume crops, as a key achievement. Their current emphasis for the Nile Valley and Sub Saharan Africa region is on the development of germplasm that is tolerant/resistant to the major biotic and abiotic stresses. Abiotic stresses, especially drought and salinity, will receive more attention in the future (ICARDA 2009b).

ICARDA's new strategy (for 2008-2010) shows several shifts in focus, among others, towards 'more emphasis on socio-economic research to strengthen community and institutional frameworks, and develop policy options for the successful implementation of new technologies'. Another point in the strategy shift focuses on 'enabling farmers to move from subsistence agriculture to market-oriented production and improve their livelihoods'. Partnerships with the private sector are explicitly mentioned (ICARDA, 2007a).

### Participatory approach

ICARDA states 'frameworks and methodologies for participatory and community-based research are also being developed and implemented in partnership with NARS to enhance the impact on rural livelihoods'. As ICARDA works with National Agricultural Research Systems, the NARS are called upon to institutionalize 'participatory and community-based approaches'. ICARDA indicates this will enhance 'technology adoption by end users and empower rural communities and enhance household social capital on a wider scale'. More impact for more farmers will be reached if 'technology relevance is enhanced and its uptake will be increased' (ICARDA, 2007b). This suggests that obtaining more knowledge from research in the field is seen as a way to improve the adoption of ICARDA's technologies.

### **3.1.2. International Crops Research Institute for the Semi-Arid Tropics (ICRISAT)**

ICRISAT focuses its research on five crops: pigeonpea, chickpea, pearl millet, groundnut and sweet sorghum. 'They are mandated to breed better for poor farmers in poor soils: dry, waterlogged, infertile, or too costly to irrigate' (Hilario, 2007:13). Hence, ICRISAT develops improved crops, that are for instance virus resistant, drought resistant, more nutritious or meet quality standards needed for export (Dar, 2007:9). Trying to remedy under-nutrition ICRISAT wants to breed higher nutrient levels into their mandate crops, especially the dryland cereals sorghum and millet.

ICRISAT uses an integrated genetic and natural resource management (IGNRM) strategy to 'improve the well-being of the poor with equity, multidisciplinary, sustainability and community participation'. IGNRM 'maximizes the synergies of biotechnology, plant breeding, agronomy, agro-ecosystems and social sciences with people empowerment at its core'. In addition, ICRISAT identifies the need for 'thematic-regional integration, multi-stakeholdership and multi-level partnerships in mobilizing science and technology for the poor' (ICRISAT, 2006). Hilario (2007: 39, 40) quotes ICRISAT's Director General William Dar saying in crop science decisions ought to be made 'taking into account natural resource fragility, community vulnerability, risk profiles, asset resilience, market options'.

ICRISAT believes the drylands are favoured for cultivation because of sunshine, fewer pests, easier terrain and large underground or river water resources (Dar, 2007:11).

### Participatory Approach

ICRISAT states it learns from farmers through village level socio-economic studies, land use surveys and farmer field schools. 'We also involve farmers in our plant breeding research to learn about the plant traits that they value most' (Dar, 2007:27). Co-learning with farmers and research on how they innovate is referred to as building social and knowledge capital. ICRISAT states this also 'helps us improve institutions and cooperation mechanisms such as community self-help and joint credit associations, micro-credit from socially-conscious lenders, market opportunities that diversify risk and affordable insurance against severe drought' (Dar, 2007:28).

Learning from the fact that farmers decrease risks by diversifying within and between crops, ICRISAT 'helps farmers expand their agro biodiversity and market opportunities'. This is done by 'increasing the number of high value crops, trees, shrubs, and herbs available for cultivation' (Dar, 2007:30)

### Private sector Involvement

According to ICRISAT private-public partnerships are being mainstreamed in agricultural research: 'We are witnessing a gradual convergence of the public sector's pro-poor development goals and the private sector's commercial interests' (ICRISAT, 2006). ICRISAT has been trying to convince the private sector to become partners with scientists and government in running a biofuel industry with small farmers as active partners and direct beneficiaries (Hilario, 2007).

### Markets

ICRISAT feels 'research-for-development institutions including policy and technical initiatives should help agriculturalists capture higher-value markets that are emerging as the drylands join the global trend towards urbanization'. Dryland farmers instead of foreign exporters could service the urban centres where raising

income is increasing the demand for fruit and vegetables. Vegetables do require more care and investment than grain crops.

For its West and Central African strategy the role of the market is explicitly mentioned. 'A primary driver for ICRISAT's strategy in WCA is to spur market demand. We will create incentives and opportunities for the poor to grow their way out of poverty through market-orientated production and value addition, in addition to ensuring their own food security' (ICRISAT, 2006).

#### **Box 1 Food shortage in Niger**

According to ICRISAT the food shortage in Niger (famine of 2005) was caused by poor soil fertility, which is seen as the major food production constraint. Malnourished plants do not develop a proper root system and therefore cannot take up water when the rains come, water is wasted. A tiny dose of fertilizer is the answer. Adoption of this strategy is prevented by lacking access to fertilizer, access to credit, insufficient flows of information and training to farmers and inadequate policies. These hurdles can be overcome by forming farmer cooperatives. Farmers store grains together, receive loans with the grain as collateral and sell the grain when the price is high (Dar, 2007:9).

#### Specific programmes

The Sahelian Eco Farm is led by ICRISAT and includes partners like the NGO SOS Sahel and (inter)national research centres. The Sahelian Eco-Farm model consists of nitrogen binding acacia trees, fertilizer, water harvesting and diversifying into 'high-value specialty crops such as fruit trees, vegetables, fibrous grasses, herbs and medicinals' (Dar, 2007:12). For this post-harvesting, transport and marketing also have to be developed. This can be done by farmer cooperation, private sector partnerships and enabling policies: a holistic systems approach is needed, according to ICRISAT.

The Desert Margins Program (DMP) is implemented by the United Nations Environment Programme and executed by ICRISAT, many partners are involved. The DMP strategy is to analyze the root causes of dryland degradation in Africa, document indigenous knowledge of sustainable practices, develop more sustainable practices, help governments design policies that encourage sustainable practices, enhance African institutional capacities for land degradation research and outreach, facilitate the sharing of technologies, knowledge and information and forecast possible climate change scenarios for land use planning (ICRISAT, 2004). ICRISAT states that through the DMP it confronts the myths that fertilizer is too risky and crop diversification challenges the myth that only low value grain suits dryland (Dar, 2007:18).

Biofuels are an important focus, for ICRISAT this centres around sweet sorghum and jatropha. Sweet sorghum is targeted to provide raw material to make ethanol. ICRISAT is exploring the genetic variability in Jatropha 'to find higher-oil types to increase its income earning potential' (Dar, 2007:25). Noting the danger that biofuel crops can replace food crops, ICRISAT argues that the demand for sorghum as a food crop has been decreasing in India because of urban preferences and subsidies for wheat and rice. Sweet sorghum is a variety different from sorghum for grain (N de Ridder 2009, pers. comm., 18 June). ICRISAT states it can help transition sorghum from a food to a fuel crop, thereby increasing income for sorghum producers (Dar, 2007:25).

#### **3.1.3. International Center for Research in Agroforestry (ICRAF)**

ICRAF, nowadays known as the World Agroforestry Center, is an autonomous, non-profit research organization whose vision is a rural transformation in the developing world by integrating trees with agriculture. Trees have a major role in the improvement of food security, nutrition, income, health, shelter and energy resources for people and environmental sustainability of dryland regions (A van der Zijpp 2009, pers. comm., 25 June). ICRAF works in six eco-regions across Sub-Saharan Africa, South and Southeast Asia, and Latin America (ICRAF, 2008).

Maximizing on-farm productivity of trees and agroforestry systems as well as improving tree product marketing for smallholders are major research priorities of ICRAF. The research outputs of this institute are used by

national and local policymakers, cooperatives, farmer organizations, Non-Governmental Organizations (NGOs), National Agricultural Research Institutes (NARI), other members of the research community and government extension services (ICRAF, 2008). Most of ICRAF's research is done in collaboration with national and local institutes. They work with national agricultural research systems (NARS), universities, NGOs, micro-finance institutions, community based organizations, private businesses and farmer associations (ICRAF, 2008).

#### 3.1.3.1 Participatory Approach

ICRAF has one project that focuses on West African dryland. This project uses an ecosystem approach to restore West African drylands and improve rural livelihoods through agroforestry. The implementation of this project is built on national capacity in ecosystems approaches to dryland management. National capacity building is facilitated through joint implementation of science by advanced scientific institutions with national research and extension staff, natural resource managers and farmers (ICRAF, 2006).

#### **3.1.4. International Livestock Research Institute (ILRI)**

ILRI focuses on livestock research, poverty reduction and sustainable development. It operates in Africa, Asia and Latin America, with offices in East and West Africa, South and Southeast Asia, Central America and China (ILRI, 2008). The strategy of ILRI is to focus on securing the assets of the poor people, improving smallholder and pastoral productivity and increasing market participation of farmers and pastoralists (ILRI, 2009).

According to the strategy of ILRI to 2010, it has four main research themes that address issues related to livestock:

- Facilitate innovation: adapting and delivering of technology and information. This research theme focuses on the development of improved technology, transfer of improved technology to farmers and/or pastoralists and bringing information from farmers or other beneficiaries of their research.
- Improving market access: opportunities and threats from globalization and the 'Livestock Revolution'. The main objective of this theme is to facilitate the livestock related market participation of producers and to increase the product value at farmers hand by improving post-harvest handling.
- Securing assets: better livelihoods through the application of biotechnology. ILRI is committed to do research on biotechnology for the development of vaccines and mapping genetic traits, which secure livestock assets and helps conventional breeding research.
- Sustaining lands and livelihoods: improved human and environmental health. It emphasizes the positive and negative effects of livestock and their products on the health of people and environment.

#### Participatory Approach

ILRI facilitates the adaptation of the Farmer Field School (FFS) concept to improve livestock systems in developing countries (ILRI, 2009). FFSs are "schools without walls" and their general principle is sharing agricultural knowledge and information among farmers, researchers and extension agents, all being experts in these schools (Asiabaka, 2002). In an FFS farmers learn practically on the field, they organize their own meetings and extension officers facilitate the learning process. Recently 20 Farmer Field Schools for livestock have started in Kenya assisted by the International Livestock Research Institute. In Uganda, Tanzania and Gambia the FFSs are in the planning stage (ILRI, 2009).

### **3.2. Government Policy**

This section contains two main parts. The first gives an overview of the government policies relevant for dryland regions, first for Ethiopia and subsequently for Niger. The second part describes the policies of the national research institutes, first the Ethiopian Institute for Agricultural Research and secondly the National Agricultural Research Institute of Niger. While operating semi-autonomously, their policies fit with the general policy of the government.

#### **3.2.1. Ethiopia**

Ethiopia's economy depends heavily on agriculture; the general policy is called 'Agriculture Development Led Industrialization' (ADLI). For the implementation of ADLI different policies are developed, some of the policies

that are most relevant for dryland issues are outlined here: research policy, rural and agricultural development policy and land policy.

### Research policy

There is a long history of research by research institutions and higher education. The emphasis was on doing research to support the education of students, therefore there was less attention to research in the field. However, until recent times they addressed only crop production in areas having high production potential and on state owned farms. Dryland and pastoralist areas were overlooked until 1999 (ICARDA, 1999). Current research is starting to address these areas.

### Rural and Agricultural Development policy

Ethiopia's rural development policy addresses the contribution of agriculture to food security and general economic development. For this report the focus is on the agricultural research related aspects: starting with a summary of the policy, strategies specifically for dryland areas and the strategy in pastoral areas.

#### *Summary of the policies*

"Rural agriculture and development strategy is a development strategy which enables to save capital and utilize large amounts of human power and land" (Ministry of Information, 2001). The major reason why the rural and agriculture-centred development strategy is vital for the country is that it creates favourable conditions for the development of trade and industry. The policy enables the country to promote rapid and sustainable economic development through continuous improvements in technology and capital accumulation. Also it creates the possibilities to improve Ethiopia's position in international relations and enhance benefits from it (ibid.).

To implement the policy different strategies were developed. One of these is to preserve, register and utilize the endogenous knowledge in agricultural practices. It can be used as a base for development. The agricultural knowledge and skills of farmers are obtained from experiences inherited from their ancestors. They are used to adapt to the changing environment. Another strategy is to select the best traditional agricultural methods and disseminate them to other farmers.

Next to traditional methods, farmer's education and training with modern agricultural technology and techniques is a basic issue in the government strategy. Intensive work is required to educate farmers and implement new technologies, since it is difficult to implement new technologies when, for instance, farmers are unable to read the accompanying instruction manuals.

In order to improve their agricultural skills and production capacity, illiterate farmers are trained through extension services by using demonstration fields. The experience within the country is combined with experiences from other countries that are relevant to the specific agro-ecological situation. The government wants to fully utilize the capacity of illiterate farmers, and put in maximum effort to educate the next generation farmers (ibid.).

To educate the next generation primary schools need to be constructed. In addition, farmer training centers (FTCs) are needed throughout the country. FTCs are important for the provision of agricultural training, extension services, and information and as permanent centers of exhibitions. Occupational level agricultural colleges, like technical and vocational training (TVT) centers play an important role in the general capacity building of the work force involved in agriculture. For each Kebele (mid-level administrative unit, comprising twenty to twenty-five villages), the Ministry of Agriculture assigns three graduates of TVT colleges to provide services to farmers. Per Kebele one graduate is assigned to crops, one is assigned to livestock and another to natural resource management (ibid.). They provide extension and consultancy service to uneducated farmers and train educated rural youth at the kebele's demonstration sites. (T Belay 2009, pers. comm., 5 June; Ministry of Information, 2001).

Beyond capacity building at all levels of human labour involved in agricultural activities, the generation, multiplication and diversification of technology is another strategic approach. The Rural and Agricultural Development policy states that improved technologies should be site specific for different agro-ecological circumstances. Therefore, agricultural research being conducted and the technologies being generated should

be based on the existing tangible problems of the farmers. Researchers must also take into account the detailed works in the production chain, from the beginning of production to the point of supplying outputs to the market (Ministry of Information, 2001).

According to the Rural and Agricultural Development Policy, research needs highly skilled and educated researchers and large amounts of capital to reach the targets mentioned above. It will take time, however, the country can not afford to wait until the requirements of capacity of researchers and budgets are fulfilled. Therefore, the policy states the necessity of searching for and selecting exotic technologies which are suited to the countries' situation. They should also develop new technologies relevant to the agro-ecological circumstances. Research results reach farmers in different ways, for instance by written notes, seminars and demonstration fields, depending on the farmers' level of education and current skills. Dissemination of technologies is done by extension service agents with close supervision of extension professionals. Moreover, close linkages between the research and extension systems are the main issue to reach the required goals (ibid.).

Educating the agricultural workforce that generates new technologies and/or improves existing technologies, by itself is not the only road to success. Multiplication of the generated technology is equally important. For this the involvement of relevant actors, selected farmers, private investors and/or state owned enterprises are necessary, depending on the type of technology. The government should generate, test and transfer technologies to farmers. The multiplication aspect of improved varieties should be handled by selected farmers. State owned enterprises and/or private investors should handle the multiplication of technologies (ibid.).

All stated strategies are a general guide for all agro-ecology, but developing specific strategies for every agro-ecological zone is also necessary. Due to the fact that the country's agro-ecology is so diverse and it needs diverse solutions to address specific problems.

In drought prone areas the main issue is insuring food security. To be food secure, working in agriculture is not the only solution. Diversifying income-generation into non-agricultural activities to buy food is an alternative way; however, this may not be a solution for all people who suffer from food insecurity. The major opportunity is in agricultural activities. To be effectively food secure in these areas the focus is on improvement of water utilization, strengthening protection of natural resources and sustainable improvement in agricultural technologies. However, "it takes time, so the short term solution is disaster prevention in parallel with acceleration of development by different strategies in settlement, protection of natural resources conservation and livestock resources" (ibid.).

#### *Strategies developed for dryland areas*

The government wants people to resettle from the drylands into low land areas with high production potential. This strategy needs the consent and involvement of settlers for its implementation. The government has started to construct the infrastructure that is required in resettlement areas immediately like health centres, education and roads (ibid.).

Drylands are not only known for inadequate and erratic rainfall, they are also known for their severely degraded natural resources, deforestation, soil erosion and also improper cultivation of sloping areas. The degradation and deforestation has resulted from improper land use and weather impacts. To resolve these problems rehabilitation measures that resolve short term and long term problems are required. For example, avoiding crop cultivation on sloping areas, making closures (for controlled grazing) and planting legume trees as a source of animal feed and fire woods in short term and conserve soil and water in long term result (ibid.).

The government strategy states that in areas where crop production is not possible anymore people must change to livestock or poultry production. Changing the system requires supplementary activities like insuring market availability and encouraging private companies to supply feed for livestock. In addition, the government strategy mentions improving livestock breeds through the selection of domestic breeds in the country and neighbouring countries. This implies active improvement, not only importing improved exotic breeds.

The result of improvements should be disseminated to producers. However, if animals do not get enough forage and feed they cannot demonstrate increases in terms of productivity and numbers. Therefore, the “local and national government should encourage factories and institutions that produce animal feed concentrates” (ibid.). Private organizations can play a great role in this respect.

In order to reach the goals mentioned above, each actor must do their part and improve their activities continuously (ibid.; A de Jager 2009, pers. comm., 28 June).

Next to this, the government strategy mentions measures for proper utilization of water need to be taken, by constructing dams and using different technologies like drip irrigation. These activities should be backed up by providing training, materials and credit access to construct dams and purchasing of equipments. In these areas extension agents must be able to give enough advice and technical support (Ministry of Information, 2001).

#### *Strategy in pastoralist areas*

Pastoralists are known for their movement from place to place to find drinking water and pastureland. Before trying to improve the animal husbandry technology of the area, the local practice must first be studied. A new technological package can thus build on the strong aspects of the local practices. The government policy encourages pastoralists in areas where underground water and arable land is available, to switch to irrigated crop production (ibid.).

#### Land policy

Ethiopia is one of the few countries in Africa that has not made significant changes in its basic land policy for over three decades; except for occasional land redistributions to accommodate the growing population (Gebreselassie, 2006). “Even though equity or social justice seems the major objective of the redistribution, it also demonstrates the loophole in the policy which allows local authorities to use the land policy as a political instrument” (Gebreselassie, 2006).

Access to land is an important issue for the majority of Ethiopian people who depend on agricultural production for their income and subsistence (ibid.). Land is under the state ownership and the government has the right to redistribute land whenever they feel it is necessary. If farmers’ land is taken (for infrastructure or to lease to private investors) the invested capital and all improvements made on the land is compensated by the government or investors (Ministry of information 2001; Gebreselassie, 2006). The policy stipulates that since land belongs to the government, it cannot be sold, exchanged, or used as collateral (ibid.).

The land policy discourages long term (rural to urban) migration to search for non-agricultural employment. Because farmers could lose ownership if land is left unfarmed for a season or rented for a long period. The land policy is a major reason why the majority of farmers operate farms that are too small to make them sustainable and profitable use of technologies (Gebreselassie, 2006).

### **3.2.2 Niger**

The government of Niger has developed different policies to alleviate poverty and to improve food security. This section describes the research policy, poverty reduction policy and land rights.

#### Research policy

Research in Niger is divided among different research agencies, each with their own activities. INRAN’s (National Agricultural Research Institute of Niger) primary purpose is to contribute to the attainment of food security and rural development in Niger. Their research focus includes crops, agronomy, animal sciences, forestry, fisheries, and agro-ecological and environmental issues. It takes up most of the agricultural research staff and budget of the country (Stads, et al., 2004). The second government agency conducting agricultural research in Niger is the Directorate of Cattle Breeding Centers and Livestock Stations (CMB-SE). This organization is allocated one quarter of the agricultural research budget (ibid.).

Four higher-education agencies conduct agricultural research and development activities in different faculties. The faculty of agriculture in Abdou Moumouni University (UAM) conducts applied research on vegetables, livestock, soil and water conservation, forestry, agricultural engineering and socio-economics. The remaining three higher-education agencies are the “Biology Department of the Faculty of Sciences, focusing on crops and

natural resources; the Human Sciences Research Institute (IRSH), focusing on the socioeconomics of rural life in Niger; and the Radioisotopes Institute (IRI), focusing on nuclear research” (ibid.). The agricultural research agencies participate in collaborative work with regional and international research organizations (ibid.).

### Poverty Reduction Policy

The general strategy of the Niger government is poverty reduction. The government considers degradation of natural resources and the modest-to-declining access to credit for the rural poor as the causes of rural poverty. Agricultural production has declined following low rainfall and the resulting reduction in cultivated acreage and crop yield (Office of Prime Minister, 2002). The government identifies underdevelopment of sectors and factors of production as the major barriers to rural development, which is the engine of the economy. The government has set as one of its strategies to include the society in identifying problems and their cause and set priorities. People of the whole country should participate in all levels of decision making in a bottom-up approach. The government discusses with the society to prioritize the major activities to reduce poverty. According to the government the country’s people have set food security, agriculture and livestock as the priorities in order to eradicate poverty (ibid.).

On the basis of the priorities of the people, the government has defined its national priorities. It has attempted to deal with most of the concerns expressed by the communities, while focusing on desertification and environment, management of hydraulic resources, decentralization and opening up of remote areas (ibid.). The Nigerien government’s strategy is to focus on the agro-pastoralist and livestock sector because the largest part of the population (85%) lives in rural areas (ibid.). In addition to this, the strategy is accompanied by measures to fight desertification in order to preserve the productive land bases for agriculture, livestock and forest as well as to increase arable land and agricultural production.

### Land policy

Niger has implemented different land tenure systems starting since the time of colonization. Currently, land is in state ownership, farmers have the use right, but this varies with the type of ownership. If the land is family owned or inherited from family they have the right to cultivate it for more than six years. Migrants coming to the area are allowed to own land for a minimum of six years, after that it is up to the local government whether or not the general ownership rights are prolonged (Neef, 2000).

According to Todd Crane, in countries like Niger land rights are the biggest issue. In the past the land tenure systems were in the hands of farmers, while during the colonization it became government owned. Since then the government owns all non-farmed land. Because pastoralists live on ground where no farmers are present, they live on the grounds of the government. The villages of farmers are on lands of the farmers and so they have the right to expand their fields. Both farmers and herders try to apply pressure on the political system for the other to give up land. (T Crane, pers. comm., 4 June).

## **3.3 National Agricultural Research Institutes**

The national agricultural research institutes’ programmes fall under government policy. They are semi-autonomous and often work with the international research institutes, including the CGIAR institutes mentioned above. The Ethiopia Institute Agricultural Research is discussed first, followed by the National Agricultural Research Institute of Niger.

### 3.3.1 Ethiopia Institute Agricultural Research (EIAR)

EIAR was originally known as Ethiopian Agricultural Research Organization (EARO). It was established in 1966, with a mandate to formulate a national policy for agricultural research and to implement the policy through coordinated research centres and programmers (AfDevInfo, 2008). It consists of five research centres and eight research directories and departments. Dryland agriculture research is one of EIAR’s research directories. Its goals are to reduce poverty and maintain food security, increase income opportunities and employment generation. Further goals are to have healthier and better nourished families, conserving natural resources, reduced pressure on fragile natural resources and people-centred policy for sustainable agricultural development (EIAR, 2009). The Research Extension Farmer Linkage Department is one of the research

departments in EIAR that is used as a bridge to communicate between research, extension offices and farmers. In addition to this it has as a main responsibility to create favourable conditions for researchers, extension staff and farmers to participate in identifying researchable problems (AfDevInfo, 2008 ).

Starting from the mid 1980s, various participatory approaches to research and extension were introduced in Ethiopia. However the impact was limited due to different factors (EIAR-OARI, 2007). Researchers in the Ethiopian Agricultural Research System (EARS) have started struggling with the concept of "farmer participation" in agricultural research for a long time (EIAR, 2008). In 1985 the Research Extension Liaison Committee (RELC) was formed at the national and zone levels and currently they are also being established at centre levels (Casas, et al, 1999). RELCs are an important forum for discussing and exchanging ideas on production constraints, research programmes, and research findings (Casas, et al, 1999). The committees make efforts to improve the linkage between researchers, extension agents and farmers. However the outcome is not satisfactory (Abera, 2008). Abera does not explain why, yet Hailu mentions the representation of farmers, especially that of women, is not adequate. Cultural factors as well as budget limitations (for travel etc.) can be an important cause. Lastly, top-down attitudes of researchers also take time to change (M Hailu 2009, pers. comm., 18 June).

A new innovative approach known as Farmers Research Group (FRG) has been initiated at EIAR. In 2004 one large project commenced, which coordinated FRG in EARI. The aim of this project was enhancing farmer participation in agricultural research. It was financed by the Japanese International Cooperation Agency (JICA) (EIAR, 2008). The principle of FRG is to establish one group of interested farmers, researchers and development agents and share knowledge and information. This approach is assumed to be an entry point for client oriented research. It can also be considered the start of a turn away from seeing farmers as passive recipients, towards farmers being seen as active generators of new technologies (EIAR, 2008).

In the past, most research centres of the National Agricultural Research System in Ethiopia were located in the major agro-ecological zones of the country. The arid and semi-arid zones, especially the north-western and northern drought-prone zones, were least addressed. Research centres are now being established on different sites that represent the dryland region of the country (Jijiga in the Somali region, Shiket in Afar region, Jinka in the southern region, Humera in Tigray region, Sekota in Amhara region and Yavello in Oromia region) (EIAR, 2009). On the other hand, agroforestry and forestry research is addressed less in EARS (A van der Zijpp 2009, pers. comm., 25 May). In Ethiopia's dryland areas there are many indigenous trees and land races that are used by farmers. Yet research does not consider this potential, which could be one important solution for dryland agricultural problems (F Abay 2009, pers. comm., 11 June).

### 3.3.2 National Agricultural Research Institute of Niger (INRAN)

National Agricultural Research Institute of Niger (INRAN) accounts for three-quarters of the country's total agricultural research staff and close to 60 percent of agricultural research spending in 2001 (ASTI 2004). INRAN's primary purpose is to contribute to the attainment of food security and rural development in Niger. INRAN's research focus includes crops, agronomy, animal sciences, forestry, fisheries, and agro-ecological and environmental issues. These activities are carried out at four regional agricultural research centres based in Niamey, Kollo, Maradi, and Tahoua. Each centre oversees various research stations and units known as development support points (PAD) (AfDevInfo, 2008). Niger's agricultural research agencies also participate in a significant amount of collaborative research nationally, regionally and internationally. INRAN collaborates with international agencies like the Institute of Research for Development (IRD, France), International Crops Research Institute for the Semi-Arid Tropics (ICRISAT), International Development Research Centre (IDRC, Canada), Sahel Institute (INSAH), the West Africa Rice Development Association (WARDA) now called the African Rice Centre, and the World Agro-forestry Centre (ICRAF)( ASTI, 2004).

The earlier emphasis of INRAN was on plant breeding: the development of dwarf and early maturing varieties, which are two characteristics that are suitable for Niger's arid climate. Improved varieties were promoted throughout the country with the accompanying agronomic recommendations. These were for high-input, mono-cropped farming systems, which turned out to be highly inappropriate for the on-farm realities of Niger. Over the past 30 years INRAN has done a lot of work on extension and seed multiplication for improved varieties of millet, cowpeas and sorghum. However the adoption rate of these improved varieties was very limited

(Valentina and Samba, 1994). The same authors indicate that in the past the adoption rates of most improved cereals were very low in Niger. The reasons for this were that research focused on food crops and the research agenda was of little relevance to on-farm production constraints. Another reason is the lack of participation of farmers in research.

In recent years INRAN has begun to shift its approach to a demand-driven research agenda, allowing for feedback from farmers and consumers. The agronomy department has started developing time and location specific agronomic recommendations (Valentina and Samba, 1994). The rural economics department of INRAN has institutionalized a system of on-farm trials to identify the most urgent production constraints faced by farmers. Additionally, a cereal-quality laboratory has been established to test new varieties for consumer concerns, such as cooking characteristics (Valentina and Samba, 1994).

### **3.4 NGOs and Donors**

This section gives an overview of Non-Governmental Organizations (NGOs) and donors that are involved in dryland areas of Ethiopia and/or Niger. The section starts at the international level and moves down national level. First some important international organizations are mentioned, starting with the United Nations's IFAD and the World Bank's TerrAfrica. The European Union is mentioned in this part, because it is a supra-national organization. The international NGO SOS Sahel is followed by the programmes of a number of relevant development agencies of national governments. Lastly, two national NGOs are mentioned. They are referred to here as national NGOs because while they operate internationally, they are not part of an international umbrella NGO. International Organizations

#### **3.4.1 IFAD**

The International Fund for Agricultural Development is a specialized agency of the United Nations established as an international financial institution in 1977 as one of the major outcomes of the 1974 World Food Conference. It was established for the reason that seventy-five per cent of the world's poorest people - 1.05 billion women, children and men - live in rural areas and depend on agriculture and related activities for their livelihoods. IFAD is dedicated to eradicating rural poverty in developing countries. IFAD, in coordination with the government of Ethiopia, is implementing a special country programme (SCP). In addition to increasing production and farmer income through expansion of traditional small-scale irrigation schemes, SCP is working on the strengthening of farmer's institutions (e.g. farmers' organizations) as well as improvement of agricultural services such as extension services and seed multiplication. In Niger, in the Aguié region, IFAD has developed a project for the promotion of local initiatives for development, based on a new approach to fostering pro-poor innovation in agricultural, social, organizational and economic areas. The methodology consists of three steps: (i) identifying and recognizing local innovations; ii) selecting the innovations that are relevant and accessible to poor rural people; and iii) conducting joint trials in which farmers demonstrate their innovations to other farmers, researchers and extension workers while testing ways to improve them and apply them on a wider scale. As a result of the dissemination of these innovations (in agro-forestry, soil fertility and local seed management), agricultural production is expected to be more stable and smallholders will be better able to manage risk (IFAD, 2009).

#### **3.4.2 TerrAfrica**

TerrAfrica was initiated by the World Bank and its partners. It was launched in 2005 to 'support and strengthen the implementation of the United Nations Convention to Combat Desertification (UNCCD), Comprehensive Africa Agriculture Development Programme (CAADP) and the New Partnership for Africa's Development's (NEPAD) Action Plan of the Environment' (TerrAfrica, 2009; World Bank, 2009). Their mission is to harmonize the strategies concerning soil- and land-management, with East-Africa as its main focus. Trying to accomplish this, they work along three activity lines: coalition building, knowledge management and investment, which are mainly at national level. Some partners of TerrAfrica are the UN programmes, IFAD, CGIAR centres and the European Union (TerrAfrica, 2009).

#### **3.4.3 European Union**

Infrastructure (water, energy and roads), agricultural exports, rural development programmes and food aid security are the main focus of the European Commission support for Ethiopia (EC, 2008). A new budget of €

644 Million is signed for 2008-2013 (EC, 2008). "Life sciences and biotechnology — A strategy for Europe" mentions some more specific support for developing countries. Concerning genetic resources the following actions are formulated, (a) redefining of national research towards an appropriate mix of traditional techniques and new technologies, based on priorities developed with local farmers. Subsequently, (b) the establishment of effective research partnerships between public and private research organizations in developing countries and in the EU. In addition, the adequate capacity and infrastructure for developing countries to enter into such partnerships, in accordance with international commitments under the conventions, are mentioned (EC, 2002). This suggests that the incorporation of traditional techniques into research will also be supported by giving developing countries the opportunity to work in partnerships with the EU.

In addition, Europe is involved with the CGIAR since their foundation in 1971. For the year 2007, they provided 45% of its budget, about € 400 Million (ICARDA, 2008). An illustrating quote of the EU representative in the 10th session of the Intergovernmental Negotiating Committee of the Convention to Combat Desertification: 'the EU has over a long period of time been the largest external source of finance to combat desertification, particularly in Africa' (SIDA, 1997: 51). However, despite the fact that the EU finds the involvement and participation of local communities and other stakeholders important, its CCD planning framework shows many top-down approaches constraining this (SIDA, 1997).

In 2002, at the World Summit on Sustainable Development (WSSD) in Johannesburg, the EU-Africa 'Water for Life' agreement was signed (EC, 2009). As part of this agreement two dryland related projects have been implemented in Niger: 'Programme de développement d'une zone pastorale' and 'Utilisation of wastewater for fuel and fodder production and environmental and social benefits in semi-arid peri-urban zones of sub-Saharan Africa'. The first one concerns sustainable lowland-use, innovative agriculture and irrigation; the second focuses on irrigation and training of local researchers (EC, 2009). One of the projects in Ethiopia is called 'Integrated Nutrient Management to attain sustainable productivity increases in East African farming systems'. It aims to develop an institutionally sustainable approach to identify, test, monitor and evaluate farm- or catchment-level technologies addressing soil nutrient management constraints using principles and institutional aspects of the Farmers Field School approach (EC, 2009).

#### 3.4.4 NGOs and Development Agencies

##### 3.4.4.1 SOS Sahel

SOS Sahel International is a federation of European and African Non-Governmental Organizations (NGOs) from countries including France, United Kingdom, Luxemburg and Switzerland. They operate in Niger, Mali, Mauritania, Senegal, Burkina Faso and Sudan. SOS Sahel works with rural people across the Sahelian zone of sub-Saharan Africa. They "support community actions and initiatives that focus on conserving natural resources and increasing family food production" (SOS Sahel, 2009). The Sahel oral history project (SOHP) is one of the major initiatives of SOS Sahel International that might help to bring knowledge at the field level into the national and international research programmes. Interviews were conducted from June 1989 to July 1990 in eight Sahelian countries including Ethiopia and Niger. About 500 men and women were interviewed and given the chance to talk about their experiences, priorities, and perspectives. In Niger SOS Sahel works with pastoralist institutions to find a useful tool to bring their priorities and vision to policy-makers. One of SOS Sahel's major achievements in Niger has been the handing over of neglected local forest plantations from the State Forestry Service to twelve communities in the Zinder region.

##### 3.4.4.2 Danida

The Danish International Development Assistance (Danida) is part of the Danish Ministry of Foreign Affairs. Danida provides financial support to multi-lateral projects and diverse programmes implemented by international organisations such as the United Nations Sudano-Sahelian Office (UNSO), the Food and Agriculture Organization (FAO) and the World Bank Group.

Between November 2003 and February 2004 Danida conducted research on Farmer Empowerment initiatives in Africa implemented by different donors. It investigated the type of organisations supported, who they represent, dimensions of Farmer Empowerment pursued and the success in achieving empowerment and

development outcomes (Technical Advisory Service Danida, 2004). (See appendix for a summary of the results)

#### 3.4.4.3 GTZ

The German Gesellschaft für Technische Zusammenarbeit (GTZ) is “a government-owned international cooperation enterprise focusing on sustainable development with worldwide operations” (GTZ, 2009). It works in countries in Africa, Asia, Latin America, Eastern Europe and the New Independent States. Their objective is to “improve people’s living conditions on a sustainable basis” (GTZ, 2009). The German Federal Ministry for Economic Cooperation and Development (known by their German acronym, BMZ), United Nations (UN), European Union and World Bank are some of the clients GTZ works for (GTZ, 2009).

#### 3.4.4.4 USAID

The United States Agency for International Development (USAID) is an independent federal government agency of the United States of America (USA), working in Sub-Saharan Africa, Asia, Latin America and Caribbean, Europe and Eurasia, and the Middle East. Their aim is to assist countries ‘recovering from a disaster, trying to escape poverty, and engaging in democratic reforms’ (USAID, 2009). Four themes describe their strategy: expand and improve trade, improve the sustainability of agriculture, mobilize science and technology, and strengthen training and education. For each situation different weights are given to the themes. To implement the strategy they have formulated some ‘next steps’: ‘strengthen donor coordination in agricultural planning and activity implementation’ (USAID, 2004), and ‘develop state-of-the-art courses on strategic agriculture issues’ (USAID, 2004).

#### 3.4.4.5 FARM-Africa

FARM-Africa operates in East Africa and is focused on reducing poverty for African farmers, herders and forest dwellers. By managing the natural resources effectively they want to make long term improvements to the wellbeing of the local people. Their strategy is focused on four key outcomes: develop models of good-practice, guide governments towards supporting agricultural development, share expertise with other stakeholders and lastly, increase the understanding of, and engagement in, African agriculture (FARM-Africa, 2009).

#### 3.4.4.6 Eden Foundation

The Eden Foundation, founded in 1985, originated from the basis that there were effective means available for the fulfilment of goals of the people living in the arid areas of North West Africa. They use drought tolerant edible perennial plants that could potentially grow in such a harsh environment without artificial support. In 1988 they set up a field station in Niger to perform direct seeding experiments and arouse the interest of surrounding farmers at the same time (passive transfer) (Eden foundation, 1999). Other field experiments include how best to establish a healthy population of *Faidherbia albida* by direct sowing, performed in 1990. The tested seeds that were most promising were to be distributed for free to interested farmers. Since most farmers were illiterate, seed envelopes with advice in symbols were produced. The recommended tools are those that the farmers already have. The intention of this project is not to approach farmers but to let them initiate contact out of their own curiosity and initiative. The field station lets farmers observe, like through a shop window. Only when invited to a village Eden would visit it. To map the farmers’ preference, a register is kept of which seeds they order. The seeds are for free but the farmers pay by means of investing parts of their land and time to participate in the research. The farmers who implemented direct seeding methods will be visited annually as long as they wanted to continue, their results will be monitored and new seed orders taken. “The farm would be seen as the outer field station and the farmers as receiving free seeds as a compensation for participating in this research” (Eden foundation, 1999).

Furthermore, local extension workers were selected based on their attitude towards farmers. They must see themselves as serving the farmer and they are trained by the project (Eden foundation, 1999).

## 4. Reflection

This chapter provides a reflection of the policies studied in the previous chapter. First an introduction is given on how research has evolved, followed by sections where the main focus of different actors, namely the government, research, other organizations and farmers, is discussed.

### 4.1 Reflection on the past

In dryland agriculture there are a lot of production constraints that need research, however budgets allocated to research have remained low. Research in dryland Africa has been characterized by a top-down vision concerning the process of innovation. Another characteristic for dryland research in Africa is that in the past research institutes were focused on high productivity by using high input, and little consideration was given to farmers' concerns. Since the 1960s, farming system research has developed. Subsequently, research and experiments are conducted with more emphasis on farmer participation. A model of "transfer of technology" has been employed, in which technologies are developed by researchers and then transferred to the farmer, by use of the extension system (Clark, 2001). This works well with a high density of research and extension workers in relation to farmers. People know each other and feedback flows back into research easily. This is, however, very costly and it becomes a thin chain in case there are many dispersed smallholder farmers, and sparse numbers of researchers and extension officers. The risk is that researchers do not take into account the concerns of farmers, and the technologies they develop might not be adopted. NGOs can give support directly in this thin chain.

Over time NGOs have become more important; their budgets are substantial compared to those of local governments. Furthermore, larger NGOs are able to combine efforts with international research institutes (like ICRIASAT and ICARDA). (N de Ridder 2009, pers. comm., 28 May)

### 4.2 Comparison of government policies

Policies of both countries are different in their structure and content. Ethiopian policy is more general; it identifies the major problems, the possible contributions of key actors, and sets strategies for each agro-ecological zone, and how to implement and who applies it. Concerning the identification of the dryland problems, more emphasis is given to farmers, farmers' problems and the specific agro-ecological problems facing them. However, these concepts are applied in a manner that is top-down, and market oriented. In the end, the objective still is to get knowledge from researchers to farmers, through the work of extension agents, rather than the other way around.

Policy in Niger acknowledges that participation is an important concept in the setting of priorities at every level of decision making. How this participation is achieved and the outcomes applied remains vague. The policies could not indicate how people are involved in decision making or how solutions are implemented. However, in priority setting participation is a bottom-up approach. Currently in Niger 33 ongoing experiments focus on construction of anti-erosion systems to combat erosion and runoff, construction of manure pits for the maintenance of soil fertility and plantation of plant species for sand dune fixation. Mobilizing project implementers present in the field, sometimes the farmers' organizations themselves, is the main element in these experiments. The focus of livestock projects was on improving races/breeds, developing animal health monitoring and optimizing fodder balances. Next to this, development projects proposed to improve animal productivity and to optimize and secure fodder resources in pastoral areas. (D Hamiduo 2009, pers. comm., 4 June)

### 4.3 Evaluation of research strategies

This section addresses the state of research into dryland areas, both by national and international research institutes. Two gaps in the research agenda are observed. This section will conclude with several reasons why research might have underperformed, with respect to the application of knowledge produced.

The NARS in Ethiopia do have an attractive strategy featuring examples of farmer participation in research. However, implementation remains limited to a small number of cases. In the past the Ethiopian NARS did not give much attention to dryland regions of the country. This is changing, and now research centres have been established in different dryland regions of the country. On the other hand agricultural research centres in Niger

are more focused on crop breeding and farmers' participation in research is limited. Moreover, farmers do not have the opportunity to share their knowledge with researchers.

As for the international research organizations, the International Livestock Research Institute (ILRI) is committed to farmers' participation in research, and it has some promising projects in livestock research which can significantly contribute to dryland agriculture.

A general problem in research is that where the food security problems are the most severe there is the lowest density of agricultural research (H van Dijk, 5-6-2009). To a certain extent, NGOs fill this gap in research; they try out different crop varieties and technologies, but they largely work parallel to research institutes. There is not much cooperation and communication between them (H van Dijk 2009, pers. comm., 5 June). Nevertheless, potential synergies exist between research and NGOs; researchers could provide the argumentation and proof why NGO's or government's policies should be reconsidered. For instance, the Ethiopian government leases the best lands to foreign investors (Chinese, Saudi, investors in biofuels) while these lands are crucial to pastoralists, especially in times of severe drought. (W Goris (Agri-Profocus) 2009, pers. comm., 3 June)

One issue, in which research is lacking, is in biodiversity and agroforestry. Dr. Fetien Abay, a researcher at Ethiopia's Mekelle University, addresses the importance of focusing on biodiversity, especially issues on wildlife conservation and ecotourism biodiversity management. She states that the science of biodiversity, the effects of climate change on biodiversity, forestry, especially that of dryland forestry is in its infancy in Ethiopia. She also stresses that the local knowledge about biodiversity conservation should be given priority. Trees can be used as valuable sources of fuel wood, fodder, bee forage, medicinal value and income generation. Local people know how to use them, their selection criteria and knowledge should be integrated in the research agenda (F Abay 2009, pers. comm., 12 June).

Another gap in the research agenda is the study of adaptation mechanisms of farmers. In general, there exists very little common understanding between farmers and researchers (F Abay 2009, pers. comm., 12 June; H van Dijk 2009, pers. comm., 5 June; Kaboré and Reij, 2004). For an example of this, see the box below.

### **Box 2 The research on soil fertility management**

#### *Farmer perspectives vs. research perspectives*

A key part of farming is the management of soil fertility, from a study in Niger: they apply manure on one specific part of the field while other parts remain unfertilized. In a good season, when the rainfall is high and consistent, the yield of the manure covered land is increased. However, if the rainfall is not consistent, the manure might induce fast growth early in the season, leaving the plant vulnerable to dry spells later on in the season. So selectively applying the manure is a strategy to cope with the risk of erratic rainfall. For researchers, working in the controlled environment of research stations, this is easily seen as irrational behaviour. Hence, the fact that farmers are very skilled in manipulating soil fertility is under-appreciated. (H van Dijk 2009, pers. comm., 5 June)

Two issues stand in the way of increasing farmer participation; firstly there is considerable pressure on researchers to publish and bring money into the research organization, university or company. Even if researchers have a personal interest in applying their knowledge at farm level, they will not get rewarded for it. The focus in research is largely on getting published, and the results of applied research are harder to get published than the results of on-station trials (M Hailu, pers. experience; C Reij 2009, pers. comm., 3 June; T Crane 2009, pers. comm., 4 June).

Another issue can be that science is often seen as the only knowledge creator. However, everybody creates knowledge. Sometimes farmers do their own research, but it is not legitimized to be used in science (T Crane 2009, pers. comm., 4 June).

#### 4.4 The approach of other organizations

In general donors and NGOs put more emphasis on farmer participation than governments do. But there is a large variety in approaches. This is partly due to the varied nature of these organizations.

Organizations, such as Danida, GTZ, IFAD and TerrAfrica often work together with partners at a national level, such as universities and governments. While these organizations see farmers as essential stakeholders, their focus is on the linkages between the mentioned stakeholders. The emphasis often is on issues like fighting corruption, promoting good governance and engaging in political dialogue. These issues have a wider impact than just dryland agriculture. However, because they work at a national level, their method of working is top-down, with little scope for empowerment of local producers.

The USAID has a different vision; they are more market oriented than the organizations mentioned above. They really focus to 'build efficient and competitive economies' (USAID, 2009). Even in their 'Farmer to Farmer' project the accent is on economic impact (USAID, 2009).

Local producers seem to have a larger role in the projects of organizations such as FARM-Africa, SOS Sahel and the Eden Foundation. FARM-Africa has a strategy mainly on participation, shown in their Farmer Participation Research (FPR). Also mobile outreach camps are used to reach the pastoralists, while they travel around (FARM-Africa, 2009). SOS Sahel's Oral History Project is one example on how to make farmers and pastoralist heard in policy circles. The vision of the Eden foundation is: "Goals of a donor need to be in harmony with goals of a project that in turn needs to be in harmony with goals of a recipient." To achieve this they start with the goals of the recipient. Plans should not be followed to the letter, but flexible and the donor and the researchers should evaluate how satisfied the recipients are. The project should not serve the donor but the recipient.

#### 4.5 Farmers' perceptions

In the end, innovation is – at least partly – a social affair. It is not the availability of technologies that matter, but the decision by practitioners to adopt the technologies and incorporate them in their daily practices (Mazzucato et al., 2001). The reasons why farmers choose to adopt a technology are of crucial importance for researchers.

According to Han van Dijk, in arid regions drought and pest resistance have most priority for farmers, more than soil fertility. To illustrate this, when soil fertility is high, then the risk of crop failure is also high. If there is a good rainy season one produces a lot of biomass, but if there is a drought, this big crop needs much more water than a small crop. So where crops are growing very well, they are more susceptible to drought (see box above). Researchers have often failed to understand farmers' perception of risk and the roles the concepts such as soil fertility and moisture availability play in this.

Another concern for farmers is the short term profitability of technologies Baidu-Forson (1999) provides an analysis of factors influencing technology adoption in Niger. While it is commonly perceived that the focus of short-term profits hinders the adoption of technologies that conserve natural resources, this is not necessarily the case (C Reij 2009, pers. comm., 3 June). There is a wide variety of technologies, that both increase profits for farmers, and allow them to conserve their soil and water resources (see e.g. Haggblade et al., 2003a).

In order to take these concerns into account, research needs more input from farmers. In this chapter, some examples of trends towards more integration of farmer knowledge into research programmes have been given, but there still is a long way to go.

## **5. Question 1: How to bring the knowledge at field level into research programmes?**

In order to answer this question, different sources of information from different levels in organizations are investigated. Approaches of governments, international organizations, research institutes, NGOs and experts are presented in this order. Initiatives as well as constraints and obstacles will pass the review. Among this, participatory methods, interest attitudes of researchers and funding problems will be addressed.

### **5.1 Policy context and initiatives undertaken**

Policies of both countries emphasize the importance of economic development in general and contribution of agriculture to food security in particular. This will be achieved by participation of all actors and special attention is given to participation of farmers. Farmers are key players in problem identification and developing solutions in the struggle of food insecurity, rehabilitation and utilization of natural resources. Participatory methods are needed. In order to include developments from the field in research programmes, links between researchers and farmers need to be strengthened.

An impression of the government policies shows that fostering the participation in knowledge development and innovation to adapt to the changing environment is not addressed. As an example, studies show that the relationships among research, extension and education policy is top down, supply driven, not multi-disciplinary and priorities are not beneficial for the small holder farmer or their innovation. Ethiopia's innovation climate is weak; the innovation follows a linear path of supply driven technology dissemination through public sectors (Spielman et al., 2008).

One of the ways the EC shows in focussing more on the field level is that with the Generation Challenge Programmes (GCP) project proposals, a plan should be included describing how the results will be implemented. This is presented as a way to concentrate the minds of researchers on the end-user. Also, but still top-down, is that the EC and the CGIAR acknowledge the need to include participatory approaches and close partnerships with NARS, community based organizations, farmer groups and the private sector (Ooijen and Coombs, 2007).

Since late 1990s, IFAD's program in Niger has focused on valuing local knowledge and stimulating innovation for poverty reduction. Using grant-financed activities as a starter, IFAD has developed a large investment program. A project for the promotion of local initiatives for development in Aguié, is based on a new approach to foster pro-poor innovation in agricultural, social, organizational and economic areas. The main strategy consists of an action-research-training methodology, aiming at constructing equal relationships between extension workers, researchers and farmers. This includes encouraging of further knowledge-sharing among neighbouring villages and creating synergies between local knowledge and scientific knowledge originating from various knowledge institutions (NARS, CGIAR centres, universities) (IFAD, 2007).

According to the strategies of the international research institutes investigated in this study, they gain knowledge from the field through farmer field schools and surveys. ICRISAT declares they use this information to improve the institutions (micro-credit, insurance) around the farmers (ICRISAT, Dar, 2007:28). ICARDA states that participatory approaches will enhance 'technology adoption by end users' (ICARDA, 2007b:8). This suggests that farmers' participation and knowledge are seen mainly as a source for improving the uptake of technology. ILRI's technology transfer strategy mentions farmers' participation in evaluation, which means that farmers give feedback on the technology. Participation seems to be mainly ex-post.

There are some initiatives to change this though: Farmers Field Schools, as part of the ILRI strategy for example, is an interesting approach to take traditional knowledge and use in research programmes. In this school principle, there is no teacher and farmers and experts all have equal room to share their knowledge (Asiabaka, 2002). However, this approach is not practiced as yet in either of the study countries. On the other hand, the NARS of Ethiopia facilitate farmers' field surveys, which assess production potential and problems as well as local knowledge of a certain area (EIAR, 2009). Executing base line surveys before setting a research agenda may be a bridge to link field knowledge and research programmes. Beside this, the Farmers' Research

Group (FRG) approach is an interesting way to facilitate this linkage. An FRG is a group that consists of interested farmers, who have their contact person in a multidisciplinary research team of a research centre for technical advice (EIAR, 2008). Furthermore, the Research Extension Liaison Committee (RELC) development gives significant contribution to the transfer of traditional knowledge to the research programmes. The RELC is a committee composed of researchers, extension agents and representative farmers. The major activity of this committee is to create favourable conditions for researchers, extension officers and farmers to discuss certain issues or prepare discussion forums (Casas et al., 1999).

Nonetheless, Djibo Hamidou, AGRYMET, indicates that the evolution of West Africa's farmer communities and their structuring into professional farmers' organizations (FO) facilitated the identification and design of new projects, which are better in line with farmers' concerns (Box 3).

### **Box 3 Farmers' organizations**

The 1980s and 1990s were years of growth for farmers' organizations in developing countries, both at local level and higher (national and international, with FO federations and networks). FOs perform many roles, generally combining a number of different functions. This is either because of deficiencies in their environment or because a combination of roles is necessary if they are to provide their members with services and at the same time achieve a higher national political profile. However, a FO that is too specialized can be vulnerable in the unstable environment of rural affairs in developing countries.

Farmers' organizations frequently perform three major roles. As a first, provide services to their members: technical (like promoting technical innovation to improve their members' income) or economic (FOs may be full economic operators through the harvesting and marketing of their produce or the supply of agricultural inputs). Secondly, they represent their members' interests and, more widely, the interests of farmers and others living in rural areas. This includes the formulation of claims in negotiations, drawing-up proposals to contribute to the definition of agricultural and rural policies, and involvement in the management of agricultural sectors. Finally, they may also be involved in local development, providing social investment (schools, health centres, literacy programmes and so on).

(D Hamidou, pers. comm., 19 June)

Different NGOs have interesting experiences on linking field knowledge and research programmes. TerrAfrica acknowledges the importance to include the civil society in the process to fight land degradation. Knowledge of the farmers is used in two ways, at a platform level and at the local level. At a platform, community representatives participate in a workshop and give ideas and feedback. At local level, the farmers are involved in programming, designing, development, implementation and evaluation of the projects (TerrAfrica, 2009). FARM-Africa has the same idea about the participation of farmers in the steps from development to evaluation. The knowledge of the farmer is used in Farmer Training Schools (MATF and FARM-Africa, 2007). In Ethiopia the Farmer Participation Research (FPR) theory values the knowledge of farmers and scientists equally. They believe that when knowledge and capabilities of both sides are shared, the most effective solution can be found. However, some scientists are sceptical about this approach and think it is not proper science (Ejigu and Waters-Bayer, 2005). USAID uses the Farmer-to-Farmer (FTF) Program to reduce the knowledge gap between field level and research programmes in developing countries. This focuses mainly on the development of new technologies and on the use of natural resources. In addition to that, it facilitates the education of farmers to develop skills by using traditional and modern knowledge (USAID, 2009).

The Sahel oral history project (SOHP) is one of the major initiatives of SOS Sahel international that might help to bring knowledge at the field level into the national and international research programmes (IDRC, 2009). SOS development intervention policy aims to work through existing local structures by training farmers so they can become self-reliant and manage their own projects in the future. Their activities include capacity building of village development committees by developing associations on subjects such as Participatory Rural Appraisal, organizational management, book-keeping, project design, monitoring and advocacy (SOS Sahel, 2009). In

Niger, SOS Sahel UK is working with pastoralist associations to determine a useful tools to help pastoralists manage their environment and to bring their knowledge and vision to policy-makers (SOS Sahel, 2009).

The Eden foundation works with the intention to not approach farmers but let them start contact from their own curiosity and initiative (passive transfer). The field station enables farmers to observe, similar to looking in a shop window and only when invited to a village, Eden would visit it. Farmers receive the seeds for free, but in return they take part in research by means of investing space and time. Their results would be monitored and new seed orders during an annual visit. Moreover, local extension workers were selected to be trained by the project if they met the requirement of respect the farmers in a way that they saw themselves as serving the farmer (Eden foundation, 1999).

## 5.2 Experiences of experts

Dr. Wellington Ekaya explains that next to capacity building for dryland communities to enable them to set the research agenda and demonstrate the potential of drylands, policy makers at national and international levels need to appreciate the plight of dryland communities and the need to invest in Africa's drylands (WN Ekaya 2009, pers. comm., 15 June). The third solution he describes is the importance of networking between individuals, NGOs, funding agencies, research institutions, etc working in the drylands. This will be addressed in when answering question 3.

One of the main obstacles in linking farmers and researchers is the fact that budgets reserved for agriculture have been slashed in recent decades (Haggblade et al., 2003b). Han van Dijk, Wageningen University, refers to this by saying, that governments have cut back budgets for research, so research should be left to the market. Ken Giller, Wageningen University, even states that: usually agricultural research is underfunded by governments in dryland countries. Moreover, NGOs working there have more money to do research, large NGOs even have a larger importance in this context than governments in dryland countries (K Giller 2009, pers. comm., 28 June) .

Fetien Abay of Mekelle University Ethiopia agrees with the importance of field knowledge for research programmes. Research should focus on indigenous knowledge and lessons from nature about plant genetic resources, land management, indigenous trees, shrubs and bushes with respect to their use, management and production potential. For example, it is estimated that around 12% out of 6,500 to 7,000 of higher plant species in Ethiopia are endemic. Beside this, forest cover is estimated to be around 3% and these endemic plants are in grave danger of disappearance even before their potential is well studied, though in most cases local people know and use them (F Abay 2009, pers. comm., 12 June; H van Dijk 2009, pers. comm., 5 June). According to Han van Dijk, the presence of researchers in dryland regions is a necessity. They should study farmer practices and maybe find ways of introducing more drought resistant crops into this system. Next to this, drought resistant crops in one area should be tested in an area with higher rainfall, but there are other difficulties (F Abay 2009, pers. comm., 12 June). Tesfay Belay agrees with Han van Dijk concerning the importance of research on drought resistant crops, but mentions trees (T. Belay 2009, pers. comm., 5 June).

Unfortunately the attitude of researchers forms another obstacle. Dryland research is not perceived as interesting, but rather too variable to understand. Even if a government would make demands for dryland research, researchers could still refuse (Box 4). Donors and even NGOs consider dryland regions too difficult, so their strategy should also change. (H van Dijk 2009, pers. comm., 5 June)

### Box 4 Story of failure

For example, the WARDA in Mali investigated cultivating flood rice in the river Niger area. After 3 years the researchers said they couldn't handle the climate variability and the building was closed down. While rice is the major crop in that region and 1.5-2 million people live there. People prefer this local rice and it is worth more money on the market. (H van Dijk 2009, pers. comm., 5 June)

To summarize, policies of the governments and the EC address a top down approach and are not focussed on participatory research. Although, the EC supports farmers' participation through the CGIAR centres top down

approaches still exist. IFAD at least aims to strengthen and encourage farmer research links. Farmers' Field Schools, Farmers' Research Group, Research Extension Liaison Committees and farmers' organizations are some of the initiatives providing room for knowledge transfer from farmers to researchers. Different NGOs have a focus on participation of farmers, such as the platforms of TerrAfrica. Experts experiences used in this chapter stress the importance of networks.

## 6 Question 2: Is there a need for harmonization of policies and interventions in the field?

This chapter will try to answer the question whether there is a need for harmonization of policies and interventions in the field. First a general answer to the question will be given, followed by some examples stressing the need for harmonization.

### 6.1 Introduction

In Paris at 2<sup>nd</sup> March 2005 ministers of developed and developing countries, multilateral and bilateral development institutions signed the Paris Declaration. It addresses five main issues for development programmes, namely ownership, alignment, harmonization, management of project results and mutual accountability. Focusing on the harmonization, it is argued that there is a need for harmonization of policies and interventions at the international, national, and local levels (OECD, 2005).

In order to assess the need for harmonization of policies in Ethiopia, a questionnaire was sent to an Ethiopian researcher, as part of the research for this report. It became clear that policies play a key role in ensuring that people invest in using available resources sustainably to improve their livelihoods. Policies should improve research-extension-farmer (community) linkages and co-operation, integrate traditional knowledge with innovative technology, and improve stakeholder's stakeholder participation in research, extension, training, awareness and education programmes (D Hamidou 2009, pers. comm., 4 June).

### 6.2 Subjects for harmonization

In order to give a better idea why harmonization is needed, some examples will be discussed now. First two examples at government level are given, followed by two examples from research centres. Finally an example of NGOs is issued.

#### 6.2.1 Government policy

Mulat (1999) mentioned there has been no change applied to the policies of Ethiopia (as cited by Geberesselasie, 2000) in the last three decades, so they do not address policy harmonization issues. Within the government policy harmonization is needed between the rural and agricultural development policy and the land policy at two points.

The first contradiction within the policies is about the land tenure. The rural and agricultural development policy from 2001 urges farmers to have a non-agricultural employment to generate income. However the land policy of 1994 argues that farmers lose their land when they don't farm the land for a certain time. So on the one hand the farmers are pushed to do off-farm employment; on the other hand they lose their land when they leave it.

The second contradiction within the policies is in the investment in land. The rural and agricultural development policy from 2001 stresses the need for the technological development in soil and water conservation. These activities need high capital and labour investments and it takes time to recoup this investment. However the land policy of 1994 states that land can be redistributed whenever it is needed. Farmers do get a compensation for their investment, but land tenure insecurity causes low investment and need conservation measures (Gemedhin et al., 2003; J de Graaff 2009, pers. comm., 11 June). So on the one hand the farmers are pushed to do long term investments and on the other hand they could lose their land at any time without receiving a fair amount of money for their investments.

#### 6.2.2 Research centres practices

In Ethiopia the national agricultural research system has a good strategy to use participatory research. However, on the ground level not a lot of participatory research is done. Therefore harmonization between policies and interventions is needed (Y Abebaw (Gondar Agricultural Research Centre, Ethiopia) 2009, pers. comm., 10 June).

Another example is the use of modern techniques in drylands. Agriculture in most of dryland Africa is not constrained because of poor quality of starting material, but because of low soil fertility and water scarcity. The traditional way of coping with low soil fertility in Niger is to let land fallow for long periods (more than seven years). Growing population pressure has made this strategy impossible, and most plots of land are now under permanent cultivation (Wezel and Haigis, 2002). Farm modelling suggests that this intensification of land use will eventually lead most farmers to adopt improved technologies such as fertilizer and improved varieties, but not after the possibilities of more traditional technologies have been exhausted (Abdoulaye and Lowenberg-DeBoer, 2000). Among the reasons why farmers are reluctant to adopt “modern” technologies like inorganic fertilizer is the risk associated with them. Inorganic fertilizer can greatly increase crop yields, but only when sufficient water is available. If rains fail, any investment made in fertilizer is made useless. Measures aimed at improving seeds, increasing soil fertility and promoting water saving are thus intimately related. It is therefore of vital importance that actors planning interventions in any of these fields see their actions as interrelated with all the other issues. Failure to do so is one of the reasons why past performance of interventions in the drylands has been poor (Sanders and Shapiro, 2003).

### 6.2.3 International Organizations

TerrAfrica is very much involved in the alignment and harmonization of policies and interventions at (sub-) regional level. They argue harmonization is needed at policy level, so that interventions can also be harmonized. Now there are still projects duplicating and overlapping, while time and money can be spent better. A framework can be provided when policies are harmonized at lower level through dialogues. Consequently it is easier to set soil- and land-management at the country’s national agenda (Global Mechanism of the UNCCD, 2009). Other organizations such as Danida, SOS Sahel and IFAD are working with other international multinational donors in their efforts to implement the Paris Declaration. Partners in the developing countries have been primarily advocated to focus on harmonizing of the financial and administrative arrangements necessary to improve aid delivery particularly in the light of donor commitments to scaling up aid. Danida, SOS Sahel and IFAD considered harmonization of donor procedures, adoption of joint approaches, and alignment with partner country financial management systems as an essential input to make aid more effective (OECD, 2005).

All actors in the dryland field call for the need of policies and interventions harmonization, each from his point of view. For example there is a contradiction between the land tenure and rural and agricultural development policy of the Ethiopian government. Both the national agricultural research institutions and NGOs showed a need for coordination between policies and implementation interventions for participatory field research as well. International initiatives such as Paris Declaration working on harmonization authenticate the need for harmonization of policies and interventions at the international, national, regional and local levels (OECD, 2005).

International initiatives such as the Paris Declaration working on harmonization stress the need for harmonization of policies and interventions at the international, national, regional and local levels (OECD, 2005).

## 7 Question 3: How to set up a more concerted network between policies, research programmes and interventions in the field?

When considering the options to create a more coherent set of policies that tackle the combined problems of dryland farmers and pastoralists, it is important to realize that every specific locality has its own problems. This means that blanket technical recommendations for an entire country are not appropriate (Anderson et al., 2003). There exists some tension here, as approaches and methodologies are needed to go beyond isolated pilot projects in order to make a widespread impact on food security. This need for widespread impact makes it very tempting to apply technical fixes that affect entire countries or regions. But what works in one region, is not guaranteed to work in another, due to differences in local agro-ecological conditions, customs and economic realities. However, while success stories themselves might not be replicable, the *process* with which an innovation has been implemented might very well be (Haggblade et al., 2003b). Based on the above the question should not be *what* to research, but *how* to research it (cf. Omamo, 2003). It is argued here that the focus should shift from the development or transfer of technology to the building of institutions that foster interactive learning. This is not to say that no effort should be put in the development of new technologies, but that the social aspects which govern the development and adoption of new technologies at a local level should be given more attention (see e.g. Mazzucato et al., 2001). This suggests getting different stakeholders and scientists from different disciplinary background together in partnerships.

This view is shared by numerous organizations in the field, as discussed in Chapter 3. Organizations such as TerrAfrica, FARM Africa, GTZ, SOS Sahel USAID and IFAD all place the concept of engaging with local partners high on their agenda. A common reason for this is that one organization cannot tackle the multitude of issues facing the drylands.

These networks are content related, such as soil and water conservation measures, or improved marketing chains. This content is intimately related to the people on the ground, and their systems (arable settled farmers, pastoralists, agro-pastoralists). All of them need different networks and partnerships (N de Ridder 2009, pers. comm., 28 June). These networks can facilitate the interactive learning between researchers, other experts and farmers required for innovation.

### Box 5 Why are networks needed?

*Some issues from Ethiopia*

Tesfay Belay of the Tigray Agricultural Research Institute, Mekelle, Ethiopia, testifies of African-European partnerships on-going in the region are undertaken in higher education institutions, development projects and a number of NGO driven projects. He argues that the following issues need to be addressed in research and need partnership:

- Increase moisture availablely
- Identification of trees that suit the drylands
- Development of technology packages that address moisture deficit
- Identification of other resources that could address investment
- Efforts towards decreasing the livestock number while increasing productivity
- Increased funding of research

(T Belay 2009, pers. comm., 5 June)

The next section of this chapter will provide several examples of such partnerships. There are quite a lot of these active in the drylands, so the review here is by no means exhaustive, but the aim is to provide an overview of how the different actors interact. After discussing these partnerships, our attention will shift to some of the factors that influence the success of partnerships and networks.

## 7.1 Some examples of existing networks

There are different networks around a research topic, specific for each system of livelihoods, area within a country, ecological and economic environment. There are many networks and partnerships in place now. Some are partnerships at international level, involving multi-lateral organizations, while some are very local, organized around a specific topic, involving NGOs, European and African research institutes and NARS that work with extension workers. These research networks are very opportunistic in relation to funding. They are also very dynamic; they are dismantled or changed after three or four years (N de Ridder 2009, pers. comm., 28 June).

SOS Sahel UK has long-established associations with IIED, an independent international research organization. Both SOS Sahel UK and IIED also contribute in other international important development issues such as the Water Global Initiative, a multi-agency partnership involving organizations working in 13 countries in West Africa, East Africa and Central America. Africa SOS Sahel UK offices work in partnership with a regional alliance within the African organizations and traditional African institutions in each country it supports. These include Pastoralists and Farmers' Unions, Youth Associations and Women's Groups (Sahel, 2009).

IFAD works on facilitating knowledge exchange for the development of Eastern and Southern parts of Africa through IFADAFRICA. They work in partnership with national government project staff, country programmes management teams and organizations including rural organizations, such as farmers' organizations, local networks and other regional thematic networks to develop skills, opportunity to use natural resources and to earn higher incomes by promoting knowledge sharing and innovation for rural poverty reduction (IFADAFRICA, 2009).

## 7.2 What should a network look like?

The reasons why networks are needed are that different stakeholders can meet and learn from each other, and create a motivating environment for innovation and experimentation by local practitioners (Spielman et al., 2008). This contrasts with the traditional "pipeline" view of technology development and transfer. It implies that a system of horizontal partnerships of stakeholders aimed at interactive learning is needed, rather than the vertical knowledge chains aimed at technology transfer (Hall et al., 2001). So rather than researchers teaching farmers, researchers should also take the time to learn from and work with farmers. Not only researchers and farmers are involved in these networks; the multitude of issues requires different stakeholders to be involved. Therefore, these horizontal networks should combine different academic disciplines as well as public and private parties. Stakeholders that are to be included are researchers and students (from universities and institutes, both in the North and the South, and from different disciplinary backgrounds), extension workers, NGOs, private companies, and farmer organizations (Spielman et al., 2008). This allows research to be centred on the farmer, so constraints and promising innovations at the local level can be identified.

Before such a system can be realized it is important that certain issues are addressed. First is the creation of nodes in this system where the relevant stakeholders meet. These nodes of the innovation system could be cooperatives, local markets or farmer field schools, but some degree of organization should be present in order to aggregate field knowledge and disseminate research knowledge (Clark, 2001).

Secondly, a change of attitudes in universities is needed. More entrepreneurship is needed in order to find novel ways to tackle dryland issues that transcend academic disciplines. This means that universities should be given incentives to engage in networks that bring together different actors and capabilities, and continued long-term investment and improvement in the educational and infrastructural foundations of an innovation system (Spielman et al., 2008).

The third and one of the most crucial issues to be addressed is the scaling up of success stories. Small scale networks of actors should not form isolated islands of innovation, but should be part of a larger system. National actors, such as research institutes and extension services have a role to play in the diffusion of successful innovations. The best way to get innovations to a farmer is to take that farmer to a place where the innovation has been successfully implemented by other farmers, or as Chris Reij put it: "*Get farmers in a bus*"

(C Reij 2009, pers. comm., 3 June). Another way would be to make use of existing social networks (Mazzucato et al., 2001).

#### **Box 6 Using modern communication technology**

Keeping in touch with farmers far afield used to require a land rover and a dust mask with exception of in remote areas. Due to developments in communication technology and its rapid adoption throughout Sub Sahara Africa these days might be behind us. The Livestock Information and Knowledge System (LINKS) program provides information on issues such as prices, water supply, forage conditions to producers, middle men and traders in Kenya, Ethiopia and Uganda (GL-CRSP, 2005). This assists them to make informed decisions. Real time information is available upon request through SMS-messages. Another such initiative is deployed by Afrique Verte – a France-based NGO. In this case the target audience are producers of cereals in Burkina Faso, Mali and Niger (CTA, 2009).

For farmers these developments mean they no longer face uncertainties regarding prices and the marketability of their produce. Regional decision makers and NGOs now have access to real time information about food shortages and diseases. This facilitates rapid responses to development on the ground.

### **7.3 Risks**

While the creation of networks that take a holistic view on dryland research are very promising, several factors are identified that can hinder their implementation.

#### **Box 7 Likely determinants of success or failure**

The purpose of networks is to create an environment in which farmer knowledge is used in the innovation process. Some likely determinants to succeed in this are:

- Number and involvement of farmers / community leaders used as trainers
- Number of women and youth involved and impact of their participation
- Use of low-impact, simple and self-sustainable technology linked to community knowledge systems
- Extent to which extension interventions are adapted to local needs, level of skills and capacity of follow-up through farm tests and pilot schemes
- Extent to which local communities are encouraged to innovate on their own
- How readily researchers and research results are integrated into communities and policies.
- Open communication and an equal relation

(Sources: WN Ekaya 2009, pers. comm. by Hamiduo, 4 June; TerrAfrica, 2005; Gilbert et al., 2005)

First of all partners need to be aware of the cost of capacity building. Getting researchers and extension workers spread across countries as vast as Niger and Ethiopia requires large investments. This means a reversal in the trend of lowering agricultural budgets by national governments is needed (Stads et al., 2004; Beintema and Solomon, 2003).

A second risk is that despite the promises of innovation networks, actors might prefer to work on their own terms. In order to get the necessary level of co-operation, political leverage is needed (W Goris (Agri-Profocus)

2009, pers. comm., 3 June). Key players, such as donors and national governments can provide the necessary political pressure to achieve this. However, one of the success factors identified was that partners are equal and open in their communication (TerrAfrica, 2005). If one of the key players abuses their political power in a way that compromises this openness, the network is at risk. This means a balance is needed between the two; some form of pressure might be good, but too much of it will be detrimental.

Another risk to networks is that they rely on personal contacts, to a certain extent. This means that if one partner organization has a change of staff, this might lead to a weakening of the network at a crucial time (Ejigu and Waters-Bayer, 2005).

To conclude, the problems in dryland farming and pastoral areas are diverse and site specific. Therefore, it requires different solutions and interventions for different agro-ecologic conditions, customs and economic realities. In order to make an impact across these different site-specific issues, a new approach to research is needed. It is argued here that partnerships and networks should be central to this approach. However, the creation of such an institutional environment from the ground up will require large investments and political will. Commitment of all involved stakeholders is needed, in order to make an impact.

## 8 Conclusion

African dryland agriculture faces several challenges: the soil is poor in nutrients and under threat of further depletion. The main objective of this study is to assess existing policies on dryland issues of Ethiopia and Niger, and create a policy position to address the need for an African-European partnership on dryland issues. The latter consist of examining three questions of which policy documents of stakeholders, scientific literature and expert interviews were the primary sources of information. There are different policies and strategies to bring field knowledge into research programmes. According to both the Ethiopian and Nigerien government policies, farmers play a key role in identifying the problems and developing solutions. These policies also address farmers' participation, however in practice there is limited participatory research.

Nevertheless, agricultural research institutions have many approaches to bring field knowledge into their research agendas. For example there are Farmers Field Schools, farmer field surveys and there are the Research Extension Liaison Committee and the Farmers Research Group. Besides this NGOs have identical approaches, for example the Farmer-to-Farmer Program and the Sahel Oral History Project. Finally, some experts have an opinion about this. For example, Dr. Wellington Ekaya (RUFORUM) thinks capacity building is important and Fetien Abay (Mekelle University) argues that research should be focused on indigenous knowledge.

To efficiently tackle dryland problems, there is a need for harmonization of policies and interventions in the field. At the government level of Ethiopia policies contradict each other, for instance the land tenure policy and the rural and agricultural development policy. Also when policies at national level are harmonized, fewer projects will be duplicating and overlapping. Research institutions were focussed on high productivity by using fertilizer. However, this response did not address the real problem of availability of water as crop failure can occur when there is drought and investments made by dryland farmers will not be recovered.

An important issue to consider is that the challenges facing dryland agriculture are very diverse. Interventions should acknowledge the diversity of these challenges: both in terms of social perceptions of these problems, local agro-ecological conditions and economic realities. However, a general approach is needed in order to create a suitable environment for innovation and experimentation by farmers. This can be achieved by creating partnerships that combine actors from different levels (local, national, regional) and backgrounds (public, private etc.). When partnerships are made, the diverse and interlinked issues of dryland can be tackled more effectively. There are both international and local networks existing already, involving different actors. Networks should facilitate the interactive learning between researchers, other experts and farmers.

Before the realisation of a partnership, some issues need to be assessed. It concerns the creation of nodes where partners meet, a change of attitude at universities and the scaling up of success stories. Despite the advantages of partnerships, there are also some risks in networks. Among these are the high costs, the threat that actors might prefer to work on their own terms and the reliance on personal contact and possible failure if power relations are not well managed.

In general it can be said that the majority of the policies is focussed on a farmer participatory approach. However there is limited participatory research at the field level. There is no general solution that is applicable in all situations, due to a wide range of problems and different circumstances.

## 9. Discussion

Although the proposed questions were answered, there were some limitations in implementing the study. First of all there were sometimes problems with the language of different documents. While an initial search indicated there was enough information in English, it appeared later that the language was still a problem in some cases. For example, some of the policy documents and, NGO documents on Niger, were in French. Also one person could not give an answer to the questionnaire, because he could only answer in French.

Besides the language barrier, some policy documents and research strategies were not available for Niger. For Ethiopia, many policies on agriculture in dryland are available; however this made it hard to select the most important ones. In order to get information about the general view of policies in the countries, we tried to contact the embassy of both Ethiopia and Niger in Brussels and the Dutch embassy in Ethiopia. We hoped they could attribute some criticisms about the practical implementation of policies. However, they did not respond to the questions.

Another limitation in the study is the limited knowledge of some issues that are covered. For example, Ethiopia is covered quite well, since there were two Ethiopian team members who could have verified whether the most important issues were studied. In the case of Niger however, there was no frame of reference in order to assess whether all relevant dryland agriculture issues were addressed.

## 10. Recommendations

For further research some recommendations are made.

Most policies of Niger are in French and not easily accessible. Since, the team lacked a francophone team member detailed investigation could not be done. Therefore, the recommendation is that further study should be carried out on policies of Niger concerning dryland research.

Since the search on Ethiopian government policies was narrowed down in the project, it can be recommended that more time is invested in this. This could result in a much more complete overview of the policies.

In this study not a lot of criticism is given on existing policies. Policy documents often have promising words, and therefore it would be interesting to focus on the evaluation of those policies. This might give a more realistic view on the impact of policies.

Furthermore, it would be interesting to interview farmers in the countries. Through this an impression or practices at field level could be acquired. This would also allow a more complete overview of the linkages between farmers and other actors.

## List of Acronyms

ADLI	Agricultural Development Lead Industry
CAADP	Comprehensive Africa Agriculture Development Programme
CGIAR	Consultative Group on International Agricultural Research
CRAN-GRN	Collaborative Research Action Unit for the Management of Natural Resources Sahel International Niger
CTA	Technical Centre for Agricultural and Rural Cooperation
Danida	Danish International Development Assistance
DMP	Desert Margins Project
EARO	Ethiopian Agricultural Research Organization
EARS	Ethiopian Agricultural Research System
EC	European Commission
ECD	Economic Cooperation and Development
EFARD	European Forum on Agricultural Research for Development
EIAR	Ethiopia institutes of Agricultural Research
EU	European Union
FAO	Food and Agriculture Organization of the United Nations
FARM-Africa	Food & Agricultural Research Management – Africa
FFS	Farmer Field School
FPR	Farmer Participation Research
FRG	Farmers Research Group
FTC	Farmers training Centre
FTF	Farmer-to-Farmer
GC	Global Compact
GCP	Generation Challenge Programmes
GTZ	Gesellschaft für Technische Zusammenarbeit
ICARDA	International Centre for Agricultural Research in the Dry Areas
ICRAF	International Center for Research in Agroforestry
ICRISAT	International Crops Research Institute for the Semi-Arid Tropics
IDRC	International Development Research Centre
IFAD	International Fund for Agricultural Development
IIED	International Institute for Environment and Development
ILRI	International Livestock Research Institute

INRAN	National Agricultural Research Institute of Niger
INSAH	Sahel Institute
IRD	Institute of Research for Development
JICA	Japan International Cooperation Agency
NARI	National Agricultural Research Institutes
NARS	National Agricultural Research Systems
NEPAD	New Partnership for Africa's Development
NGO	Non-Governmental Organization
OECD	Organization for Economic Co-operation and Development
PFMP	Participatory forest management program
RELC	Research Extension Liaison Committee
RUFORUM	Regional Universities Forum for Capacity Building in Agriculture (Kampala, Uganda)
SCP	Special country program
SIDA	Swedish International Development Cooperation Agency
SOHP	Sahel Oral History Project
UN	United Nations
UNCCD	United Nations Convention to Combat Desertification
UNSO	United Nations Sudano-Sahelian Office
USAID	United States Agency for International Development
USAID	United States Agency for International Development
WARDA	West Africa Rice Development Association
WSSD	World Summit on Sustainable Development

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## Annex A

### Questionnaire about developing an African-European partnership on dryland research

Dear .....,

CTA gave us your email address to be able to send you this questionnaire. We are a group of MSc-students from Wageningen University taking the Academic Consultancy Training course. The main objective of our assignment is to come up with a policy position addressing the need for development of African-European partnership on dryland issues.

The policy position will contain arguments and recommendations to address these questions: How to bring the knowledge at field level into research programmes? Is there a need for harmonization of policies and interventions in the field? How to set up a more concerted network between policies, research programmes and interventions in the field?

The policy position will be formulated for two dryland regions in the countries Ethiopia (Tigray, Afar and Somali) and Niger (Pastoral, agro-pastoral and rain-fed agriculture zones). We are investigating existing policies and programmes on dryland issues, at both international and regional levels. Our strategy will be to keep the concept of 'dryland issues' as broad as possible to keep an open mind and identify issues that might become more important in the future, for instance in relation to climate change. We hope you are available to answer our questions. We preferably receive your answers before Friday the 5th of June. We advise you to try to stick to maximum 3 pages. You are welcome to attach literature documents.

Is there, in your opinion, a gap between knowledge at field level research programmes? How would you describe it? Is there only a gap concerning specific issues?

What options do you see to bring field knowledge into research? What tools are used for this? What is the role of NGOs in this?

Which dryland issues are the main focus of research and which have priority for farmers?

For which dryland issues is an African-European partnership most needed?

What partnerships do you see at the moment? What are your ideas for improvement?

What success stories of African-European partnership on dryland issues do you know?

Can we contact you if we have any more questions?

Thank you very much, we appreciate you took the time to contribute to our project.

## **Response from Dr. Wellington Ekaya, RUFORUM, 15-6-09**

### **Is there, in your opinion, a gap between knowledge at field level and research program?**

Definitely there are gaps.

### **How would you describe it?**

It will vary from region to region, but from my point of view the main challenges are:

The often weak link between extension service and research within the National Agricultural Research System. The linkage is particularly weak when one looks at the amount of research conducted by universities in Africa and how much of that is linking to extension – very little linkage. This can be attributed to a number of reasons:

Extension service is normally Government funded – in most cases the service is underfunded by government and therefore rendered ineffective.

Often times researchers, at some point in their research career, do not focus on the importance of matching their research efforts with the realities on the ground (dryland communities). For a long time particularly in the 1970s to early 1980s (in East Africa for example), dryland management and research was driven based on models mainly from the ranches of USA and Australia.- BOX?? The local knowledge existing among the dryland peoples, which had enabled them live for centuries was often seen as primitive, backward, lacking scientific basis, and not

Traditional (community) institutions are a key driver of dryland management in Africa. These institutions are very often ignored or never understood by researchers. The institutions and structure are very important in terms of identifying the research demand and disseminating research findings, measuring impact, etc.

There is a large amount of good research done and published. However, the challenge is that the information does not trickle down to where it is most needed and in the right form. Thousands of research papers exist, but these are found in journals and books which are not read by policy makers, NGO workers, and communities.

Generally the capacity to translate dryland research findings into development is still very low in Africa. A lot of good research is done but the findings only remain at journal article level. This has very limited circulation and further the knowledge is not very useful at field level.

**Is there only a gap concerning specific issues?** I don't understand the question...

### **What options do you see to bring field knowledge into research?**

Build capacity within the dryland communities themselves so that they can advance their own course in terms of research, so that they can set the research agenda in the drylands of Africa, so that they can be at the fore front of demonstrating the potential of drylands.

Engage policy makers at national and international levels to appreciate the plight of dryland communities, the potential of drylands, and the need to invest in Africa's drylands.

Enhanced networking among individuals, NGOs, funding agencies, research institutions, etc working in the drylands.

### **What tools are used for this? What is the role of NGOs in this?**

### **Which dryland issues is the main focus of research and which have priority for farmers?**

There is a good amount of research going on (and has been going on) focussing on dryland livelihoods. There are various aspects ranging from livestock improvement to climate change adaptation and resilience. All these are important for dryland farmers and it is really difficult to draw a general priority list. However, what is important is that whatever research that we do, must be demand driven, we involve the ultimate consumers, we disseminate and we link it to policy, by communicating in a language that policy makers will understand.

### **For which dryland issues is an African-European partnership most needed?**

1. The area of capacity building, for example:

Postgraduate training

Short specialized skill enhancement courses

Student and researcher exchange programmes for knowledge and experience sharing

2. Joint research projects

**What partnerships do you see at the moment? What are your ideas for improvement?**

I would need more time to research on this, but at the moment:

RUFORUM is developing partnership with the NATURA network of universities for purposes of enhancing the quality of postgraduate training in Dryland Resources Management.

The AIDA project is a model African-European partnership. As partners we need to draw some lessons and plough them into the original ideas/proposal than work on a next phase, building on our achievements in the first phase.

What success stories of African-European partnership on dryland issues do you know?

AIDA Project – This is the first that comes to my mind since I participated in the project right from writing the proposal to implementation

Sida/SAREC Regional Land and Water Management initiative in Eastern Africa

The Pastoral Information Network Programme

The works of International Institute for Environment and Development (IIED) dryland initiatives in Africa

## **Response from Tesfay Belay, Tigray agricultural Research Institute, Mekelle, Ethiopia, 8-6-09**

**Is there, in your opinion, a gap between knowledge at field level research programmes? How would you describe it?**

Yes, the gap of knowledge at field level research programmes is the fact that the real problems of farmers in drylands are not particularly and satisfactorily addressed. The gap can also be expressed in limited capacity of researchers to solve these problems.

**Is there only a gap concerning specific issues?**

The gap is not only concerning specific issues. I can say the gap in knowledge is related to incapacities of the research programmes and the government to satisfactorily address the main problems found in the dry land areas. Research institutes for example are not in a position to answer problems of food insecurity faced by communities living in the dry lands. The communities' involvement in the management of their natural resources particularly their forest and soil resources are minimal and there are no concerted efforts to thoroughly raise the awareness of the dry land communities. For example communities living in dry land areas of Tigray and Afar depend very much on aggressively utilizing the remaining forest resources for charcoal making without giving any attention to replanting of trees.

There are of course a number of policies that aim at preserving and conserving the existing forest resources in our area but there is no one to implement them.

**What options do you see to bring field knowledge into research? What tools are used for this? What is the role of NGOs in this?**

The key to success in bringing field knowledge into research and practice will be to give due emphasis to efforts that bring the dry land communities or the owners of the resources and the associated problems to the picture and to their active participation.

Tools required include development of policies and guidelines with the active participation of the communities, awareness raising, training and educating of the communities at the grassroots level.

The role of NGOs can be in motivating the active participation of the communities, awareness raising, training, and educating of the communities. But NGOs in our case are a bit limited in showing impacts on communities.

**Which dryland issues are the main focuses of research and which have priority for farmers?**

Dryland issues have not received enough attention in policy formulations and are only recently that there are some efforts that focus on pastoral and agro-pastoral areas of our country. There are also dry land areas outside of the pastoral and agro-pastoral areas and are often treated with like other potential areas of Ethiopia in all aspects of policy formulation. There is therefore a need to address these areas too as they are highly populated even compared to the pastoral and agro-pastoral areas.

Specific issues that need to be addressed in dry land research in our area should be how to increase moisture available in the dry land areas. This could be focused in different topics like identification of trees that suit to the dry lands, development of technology packages that address moisture deficit in the dry lands, identification of other resources that could address investment into the dry lands, efforts towards decreasing the livestock number while increasing productivity in the dry lands, increased funding of research in the drylands etc.

**For which dryland issues is an African-European partnership most needed?**

An African-european partnership is required in the identification of trees that suit to the drylands, development of technology packages that address moisture deficit in the drylands, identification of other resources that lead to increased investment in the drylands, efforts towards decreasing the livestock number while increasing productivity in the drylands and increased funding for dryland research.

**What partnerships do you see at the moment? What are your ideas for improvement?**

There are a number of African-European partnerships on-going in our area in higher education institutions, development projects and a number NGO driven projects. Those in the area of higher education institutions mainly target capacity building and research on dry land problems. The one on capacity building can be considered critical for they are contributing to the critical mass of people with second and terminal degrees. But

the research component in the higher learning institutions is not contributing towards solutions to the dry land areas and rather it is limited to only satisfying the academic interest of the researchers.

There is therefore a need for improvement as regards increased funding for research and also the need to be product oriented or solving the problems of the dry land community. The need for measurable indicators of success is very important.

**What success stories of African-European partnership on dryland issues do you know?**

There are many programs of partnership between African and European institutions but is difficult to mention one as a complete success story. There are of course bits and pieces of efforts here and there.

## **Response from Dr. Abay Fetien Abera, Mekelle University, Ethiopia, 12-06-09**

**Is there, in your opinion, a gap between knowledge at field level research programmes? yes How would you describe it?**

There is a lot of indigenous knowledge and lessons from nature that need to be studied in the area of Plant genetic resources, Land management indigenous trees, shrubs and bushes with respect to their use, management and production potential. It is estimated that around 12% of out 6500 to 7000 of the higher plants are endemic, and with the forest cover estimated to be around 3%, these endemic plants are in grave danger of disappearance even before their potential is well studied, though in most cases local people know and use them.

**Is there only a gap concerning specific issues?**

Issues on wildlife conservation and ecotourism biodiversity management No the science of biodiversity, effect of climate change on biodiversity, forestry, especially that of dryland forestry is in its infancy in Ethiopia, thus there is need for research in an all encompassing aspect.

**What options do you see to bring field knowledge into research?**

The first and foremost priority should be conservation of this unique biodiversity and the local knowledge about it.

**What tools are used for this?**

Focus needs to be given to local use, like fuel wood, fodder, bee forage, medicinal value and income generation with respect to these plants.

- Raising the awareness of the local people through education.
- Participating the people on the research conducted
- Giving Incentives

**What is the role of NGOs in this?**

NGO's can be actively involved in the development, management and promotion of products from these plants both at local and international levels.

**Which dryland issues are the main focuses of research? Which dryland issues have priority for farmers?**

Focus needs to be given to local use, like fuel wood, fodder, bee forage, medicinal value and income generation with respect to these plants. Recognition should be given to their selection criteria and knowledge. Their strategy to adapt the changing environment should be given recognition and incorporated in research agenda

**For which dry land issues is an African-European partnership most needed?**

In documenting, conserving and promoting the use and management of these endemic species.

**What partnerships do you see at the moment?**

There is a lot of focus on already studied high value plants like Jatropha, ... all which are exotic. I am not objecting to these projects, but a lot of biodiversity is being lost with no serious study on the potential of them for medicine, food, fodder, fuel,

**What are you ideas for improvement?**

Collaborative work in the area of documenting, conserving, sustainable using and managing, there resources with the promotion of high potential plants when found.

**What success stories of African-European partnership on dryland issues do you know?**

VILIR funded Forest Rehabilitation Project; ISWC; Indigenous Soil and Water Conservation Project) in promoting farmers innovation in land management. NORAD and NUFU (Norwegian Research Higher education support) on Participatory Barley Breeding in low input areas.

Can we contact you if we have any more questions?

Yes

**Do they function in Ethiopia? Spread over the country?**

Yes they function depending on the methodological approach of the activities. For example when you have participatory research with farmers --those farmers given the name farmer research group to identify from the non experimenters. in Some are they use the term farmers field school. FTC is available all over the country and functioning with different efficiencies

In Pastoralist areas they also function and known as PTC (Pastoral Training Center) focused on pastoral livelihood and they also have TVET at Gowane.

**Who is responsible?**

The bureau of agriculture is responsible and In Afar region the bureau pastoral and agricultural development is responsible

Vocational training school is job oriented training- e.g -skill training technical training is broader training which contributes to the capacity of existing staff.

## Response from Djibo Hamidou, AGRYMET, Niger, 4-06-09 and 19-06-09

I would like to share some thoughts with you and your classmates in giving the informations on what we understand by drylands in Agriculture in Africa.

According to Mary Tiffen, 2001, resource in many parts of dryland Africa most suitable land is already farmed due to the expansion of rural populations. This means that land has become a scarce resource. Those who want to enlarge a farm do so by buying or renting in land, in some extreme cases, if sufficiently powerful, grabbing or confiscating it. In such areas following land is no longer possible. To maintain fertility, farmers have to turn to other strategies like manuring or using chemical fertilisers. Besides, there is also little land available for communal grazing, except perhaps on roadside verges. Crop residues and the dry season weed growth have become the value personal property of the cultivator. This is now the position in all areas where the population has risen above 40 persons per km<sup>2</sup>. Cultivable dryland is scarce, and farm holdings are getting smaller. Grazing resources are under increasing pressure and soils are being severely affected by salinity due to intensive irrigation. The list of challenges is long.

From a global perspective, the following key reasons justify the concern for drylands: People living in drylands constitute a large fraction of the world's poorest. According to United Nations Development Fund (UNDP's) Human development Index, over 50% of the world's most disadvantaged countries are in dryland Africa. Achievement of the Millennium Development Goals (MDG's) becomes highly unlikely, unless poverty reduction is significantly realized in drylands

Strategies for developing Dryland agriculture: Role of knowledge.

Dr. Wellington Ekaya one of our AIDA expert partner from the University of Nairobi pointed out some strategies:

Potential strategies:

- \* improve knowledge of drylands and the indigenous communities including traditional agricultural practices
- \* improve research-extension-farmer (community) linkages and co-operation
- \* integrate traditional knowledge with innovative technology
- \* improve stakeholders participation in research, extension, training, awareness and education programmes (e.g gender, youth, indigenous communities).

Likely determinants of success or failure:

- measurable impact and uptake of extension, training and demonstrations conducted at farmer level / indigenous communities
- number and involvement of farmers / community leaders used as trainers
- number of women and youth involved and impact of their participation
- use of low-impact, simple and self-sustainable technology linked to community knowledge systems
- extent to which extension interventions are adapted to local needs, level of skills and capacity of follow-up through farm tests and pilot schemes
- extent to which indigenous communities are encouraged to innovate on their own
- how readily researchers and research results are integrated into communities and policies.

Then Dr. Wellington came up with the conclusion that policy plays a key role in ensuring that people invest in using available resources sustainably to improve their livelihoods. Large scale policies have generally not worked because they were relied on imported blue prints that lacked the flexibility that people need to survive and prosper in such regions. People indigenous knowledge is a valuable resource for managing highly variable and risky environments and building on such knowledge can help identify policies, research priorities for the scientific community and sustainable practices for the resource users.

The responsibility for deciding the future of dry land natural resource management must remain with dry land household: and scientists and policymakers are encouraged to work closely with them to achieve sustainable

impact. Can drylands people, against all odds, reduce poverty and food insecurity, and attain sustainable livelihoods with the support of the scientific community in consultation with policymakers?

About Farmers' organizations,

The development strategies of national governments and other donors often include the strengthening of farmers' organizations (FOs) as one of their aims. This reflects a desire to involve communities in defining and implementing their own rural development and their own strategies to alleviate poverty. Denis Pesche (2002) argues that the range of their services and their sizeable contribution to general welfare justifies efforts to ensure that they are properly funded from both public and private sources.

The 1980s and 1990s were years of growth for farmers' organizations in developing countries, both at local level and higher (national and international, with FO federations and networks). FOs perform many roles, generally combining a number of different functions. This is either because of deficiencies in their environment or because a combination of roles is necessary if they are to provide their members with services and at the same time achieve a higher national political profile. Also, a farmers' organization that is too specialised can be vulnerable in the unstable environment of rural affairs in developing countries.

Farmers' organizations frequently perform three major roles.

\* the first is to provide services to their members: these may be technical (promoting technical innovation to improve their members' income) or economic (FOs may be full economic operators through the harvesting and marketing of their produce or the supply of agricultural inputs).

\* The second is to represent their members' interests and, more widely, the interests of farmers and others living in rural areas (without their having necessarily to be members of the FO). This role may have many facets, including the formulation of claims in negotiations, drawing-up proposals to contribute to the definition of agricultural and rural policies, and involvement in the management of agricultural sectors.

\* Finally they may also be involved in local development, providing social investment (schools, health centres, literacy programmes and so on). So, given the shortfall in state or local and community services, they provide amenities that everyone needs. By being active in this area FOs also help strengthen local democracy and participation. I think that these statements will help in understanding the roles of FOs in developing countries since the years eighties.

## Annex B

### Interview with Dr. Ir. André de Jager

28-05-2009 (via Skype)

#### Introduction

André de Jager is a researcher at the Dutch Agricultural Economics Research Institute (LEI-WUR).

He has ample experience in Ethiopia, particularly in supply chains.

He also indicated he was familiar with agricultural research in the country, such as at the Ethiopian Agricultural Research Institute Organization (EARO, now EIAR). He thinks the gap between research and field is enormous.

#### Food security in the drylands

Mr. De Jager identified three separate regions/groups of farmers within Ethiopia:

**Marginal Areas:** These areas have structural problems, with very little room for improvement. These areas will always remain dependent on food from outside for their food security.

**Economic Growth Areas:** These areas have room for improvement: they are mostly self-sufficient in their food supply. Research is being done for this group, in areas such as improved (e.g. teff and maize) and improved dairy farming.

**Top group:** This is a group of farmers that can export to world markets, in high-value crops such as flowers. Research for this group is also weak.

In general, the research being done used to be very academic, each discipline doing their own things. The research is mostly limited to on-station research, very little dissemination of knowledge. This has changed somewhat, now it is more multi-disciplinary.

Firstly, these areas face structural problems, such as climate etc. These are exogenous, outside the control of research.

Supply chains are poorly developed. Farmers are unable to get proper inputs, and get their outputs where demand is greatest.

Then there is the low level of entrepreneurship in Ethiopia. This manifests it self at the farm; farmers do not seek new products, new markets to serve. But input and output markets are also functioning poorly, because there are few buyers/suppliers. This is changing slowly.

Poor infrastructure also limits agricultural possibilities.

#### Technology

##### Technological constraints

Every region has different constraints, general areas:

The starting material of the farmers needs be good. A lot of research goes into this.

Agronomic practices are not always optimal: application of fertilizer etc. Some areas are over-fertilized, while others are under-fertilized. More research needs to go into this.

Chains need to be improved; post-harvest technology is at a low level. This leads to losses, especially with perishable crops.

## Contribution of research

Research is not specific enough, only blanket recommendations are made. This is not effective because:

Every area has specific varieties that are best suited to local circumstances.

Agronomic practices are different everywhere, research fails to take this into account.

An essential component that is lacking is marketing research, to improve the chains.

## Up scaling

Jeffrey Sach's Millennium Villages (MV), aimed at specific villages to showcase that technology can help when properly applied. The structural problems are not addressed in these; they only affect a few villages, in which all inputs etc. are made available. But the problem facing most Ethiopian farmers is that they do not have access to these inputs. This means that there is no way to upscale the findings from these villages to the entire country.

## Partnerships

Many problems emerged during the conversation, and some hints at solutions. These solutions focused on getting people together in a "partnership" to work at a specific problem. So what would such a partnership look like?

You need your extension workers, researchers, and local farmer organizations together. Combined with this you need input suppliers, marketers and NGOs. This way you get a public-private partnership. How to create these is not simple. There are no answers on how to do this.

The problem in creating these partnerships is the low level of organization in Ethiopia. Farmers co-operatives do not exist.

NGOs do try to get around this, but their projects are usually nothing more than pilot projects, with little way of up-scaling the findings.

So you need a more original approach, such as farmer schools, in which farmers, input supplier, marketers etc. get together to exchange ideas. This could be started anywhere these people get together, such as at local markets.

## Interview Ken Giller

28-05-2009

Question 1. Can you introduce yourself?

Specialization in plant production system to increase productivity and crop life-stock system, besides that he is a rangeland expert. He tries understand complexity farms system and the different goals of people → that requires different types of expertise and research. Little work directly in Niger, more in Mali (wetter part). Book 'From management in mixed crops livestock systems in the northern highlands of Ethiopia' about Tigray (more crops that live at higher altitudes, water problems, drought problems) → however it is relevant area for us

Question 2. What is the focus of research in dryland?

first should define dryland? CTA:100-1000 mm. He says, semi arid: >700mm, and arid: >400mm, also irregular rainfall → seasonality is important, main characteristic: 1 long dry season. different types of research: economics, climate change (variability), soil fertility (his interest). constraints because of soil fertility, limit of rainfall on top of that. title of book he used: 'La Productivite des patorages sahelien' (Penning de Vries and Djiteye) → we should use graph of cover page he sais → book about rangelands, but much same for crops. adapting to different types of drought → vary cultivars adapted to spatial and temporal variability drought/rain, distribution of rain season

Question 3. Is there a link between animal, crop and resource research?

yes there is a clear link:

(semi-) Arid areas: Camels, goats and sheep, depends a lot on animals, pastoral systems disappear because of migration of more people towards their lands, influence of animals, people are not settled, to look for feed, spatially scattered, depends on rainfall pattern, water collection more important than soil fertility, they might partly settle when they have found depression in land with water, and when they settle they become arable farmers, literature on old systems middle east for collecting water

Sub-humid: cattle, free grazing cattle, store fed cattle, influence of animals lower, animals produce manure → use to fertilize, but there is not enough manure (it is important), when they are free grazing, it is hard to collect manure to use for crops, it goes back into grasslands

what has changed? lack of land, move to drier areas, where they are more vulnerable, get conflicts, nomad systems have collapsed. there are these moon shaped wholes in areas with a slope → water captured, but still need nutrients

Question 4. There is a gap between field and research?

He never gave a straight answer, but he mainly talked about the 'no-side', within WUR work with farmers, universities in EU are cooperative, there is long history of strong collaboration, till 80s more top down research, beginning 90s till now, research in collaboration mostly, also not so much on experimental fields, but just farmers. In his personal opinion: overestimate local knowledge, because people move to drier area and their knowledge is of area they moved away from, look more critically at indigenous knowledge. Our job is not extension, WUR tries to involve extension workers, knowledge generated in larger programs, communicating with NGOs and other organizations

Question 5. What about the current policies in dryland?

no idea. depends on your definition of dryland, our definition is too broad. different farming systems have different policies. policies: where is funding given too. look at EU policies in dryland. climate change and vulnerability most in policies. also look at ICRISAT and ILRI policies, IITA (tropical)

Question 6. What are the research priorities?

in agriculture → water is important

in arid: collecting water, nutrients also important (it is not precondition, but water is)

in semi-arid: water management and nutrients

in Tigray need soil fertility

Question 7. Is there a need for partnership?

university is about knowledge and communication, not everybody has to talk with everybody. need key partnerships: key centers in EU, key international centers in Africa, and relevant key institutes and large NGO. many of large NGO have technical department, don't forget to talk about NGOs, government is underfunded, so NGO has more money to do research. agriculture key part rural development. large NGOs have larger importance than government in rural development. CARE (NGO), budget millions, so far more than government, Oxfam novib

Question 8. Do you know any PhD students who might be interesting for us?

PhD worked on millet in Niger, but most work in higher rainfall areas. soil and water conservation group has some PhD students. Ken is now in a group of UNCCD → make book on degraded land (bit like IPCC idea), ICRISAT is leasing it. that document might be open for open consultation. UNCCD is global policy, therefore that document might be important, but document is still in embryo-phase.

## Interview with Dr. Ir. Todd Crane

04-06-2009

### Introduction

Todd Crane is an American who works now at Wageningen University at the Technology and Agrarian Development group. He did his PhD in anthropology (specialization in ecology) with an interest in West-Africa. He did a thesis research in Mali, where he looked at local management, and the relations between farmers and herders. In his Post-Doc he looked at seasonal climate forecasting in the USA. At the WUR he especially looks at climate change adaptation from local perspective in West-Africa.

### Knowledge gap between field and research centers

Yes there is. He thinks there are two components: a gap for farmers and a gap for researchers. The gap for researchers is the technical concept of how manage natural resources and how it really works at the ground. Often the development of management techniques misses the social component of resource management, which is essential. The gap for the farmers is the poor understanding and lack of technical knowledge. Another big issue is the disconnection between the technical possibilities and the institutional processes.

Land tenure is a social institution, but how does it interact with potential for pasture improvement and rotational grazing? They know rotational grazing works, but it is not implemented.

The research now is often participatory research at local scale. However production does not happen at local scale for pastoralists, because that is at land scale level. It does not fit institutional behavior.

The local knowledge is collected and transferred sometimes, but packaging knowledge is not useful. Better is it to use knowledge that is embedded in local institutions. Local knowledge is useful but social institutions are also important. Their overall objective is to improve land management, changing behavior and institutions.

### How to narrow the gap

There should be more participatory research, although that is a broad concept. The idea is to get away from the notion that only science can create knowledge. Knowledge production is everywhere, and anyone can do it. Within that there are boundaries. Researchers are often judged by publications and how much money they bring into company or university. There is no formal reward for own input at ground and that is a problem. Researchers want to have an impact on the environmental condition, but they don't get rewarded for that. They might even lose their job for that.

Another thing is that interdisciplinary is needed, because it has a big potential to work at the ground. You need both environmental and social disciplines.

By blurring the distinction between basic research, applied research and straight up application (e.g. mostly NGO) an opportunity arises to work more effective.

Sometimes farmers do their own research, but it is not legitimized to be used in science. Social sciences push research towards participatory research. They are trying to bridge the gap between technical advances and applied utilities.

### Current research focus in dryland

He has only worked in Mali, so his ideas are based on that country. There the biggest issue is land rights, because there is an increased encroachment upon water resources and an increased use of land. In the past the land tenure systems were in the hand of farmers, during the colonization it was in hands of the government. They kept in place the land tenure mostly, but overlaid some. The government owned all non-farmed land. Since pastoralists live on ground where no farmers are present, they live on ground of the government. The villages of farmers have the right to expand their field, more than the herders have the right to expand their land. The country is moving towards decentralization. The herder think the government should stop the farmers taking more land.

The intensification is another big problem. This means for the herders that they are pushed to keep less animals on a smaller piece of land. But they don't want this, because it damages their ethnic identity. For farmers it means they are pushed to have animals as well for manure, ploughing etc. They also need to have a closer management of a smaller amount of space. But they partly disagree, because it is counter intuitive to be able to produce more by farming less. Then also another threat comes: if they farm less, they use less land and might lose this land. It are both the national government as the international world who are pushing towards intensification, because they want to reduce the pressure on the environment.

Also climate change is a pressure to stop extensive farming and herding. The Sahel is at forefront of climate change variability. It is very important is research. But for the people it does not matter whether it is climate variability or climate change. The concerns for drought are severe and well-based.

#### Priorities of farmers

The herders don't want to be forced to farm. For farmers the food security is the main focus. Also education and health are important, but the role of research in this is debatable. Both farmers and herders try to practice pressure on politics for the other to give up land. Farmers are increasingly strong due to decentralization which gives them more rights. On the other hand, the herders can be quite powerful as well, since some families are very wealthy. Since some of them have a lot of money they can bribe political peoples.

The farmers have an interest in cash crops (watermelons, maize), and are less interested in millet and sorghum. They think a chemical fertilizer is no replacement for manure, due to the problems of burning and not increasing the soil fertility.

#### African-European partnership

Capacity building is an important issue. The increase of African research is most impactful.

## Interview with Chris Reij

03-06-2009

### Introduction

Mr. Reij is a human geographer, and he's worked in the Sahel region since 1979. He's also has extensive experience in Ethiopia. As the Sahel was characterized by droughts in the 1970s and 1980s his focus shifted: less human geographer, more soil and water conservation (SWC) specialist.

He thinks people are too pessimistic about the drylands. Firstly, because the investments that have been made by farmers are underappreciated by experts. Examples are the widespread adoption of Zais (improved planting holes) in Burkina Faso and Niger, and the reforestation of the Zinder region in Niger. When these investments are analyzed, usually the ex-ante expectations of their impact on yield are taken into account. According to Mr. Reij it's also necessary to take into account the ex-post secondary benefits; These benefits include a positive impact on climate and water tables (rising 4-5m), trees around the fields grow faster and yield more fruit, and youth does not need to migrate out of the village. Secondly, people incorrectly assumed that SWC measures only have a positive impact on medium- to long-term incomes. When water is retained, this has an immediate impact on yields. So SWC has a positive effect on short-term income.

Some trends that have been missed are increasing tree growth in Niger, and improvements in soil and water conservation in Ethiopia.

### Dryland issues

The investments that have been made have not been identified.

Long-term trends are not taken into account. Things aren't going well in the Sahel, but they are not nearly as bad as twenty-thirty years ago.

Successes need to be identified, and then scaled up/spread to other areas.

### Role of research

International Agricultural Research Centres (e.g. ICRISAT) focus a lot on fundamental research. If you don't do fundamental research, chances of being published are lower, and this hampers a researcher's career. This is also a problem for the national institutes. Apart from that, these National Institutes are simply underfunded as well. Good researchers leave as soon as they can.

What these research institute could do, is to engage more in adaptive breeding; finding crops that are well-suited to local conditions.

Another good option would be to put more focus on identifying farmer-innovators. These can be very crucial when it comes to creating sustainable innovations. He mentioned a farmer in Burkina Faso that played a huge role in the introduction of the Zai, by creating a self-organized private extension service.

### Gap between field and research

In some cases. It is very attractive for researchers to do on-station research, and not bother with farmers too much, as they're primarily interested in publications. So the links between research and field aren't as close as they could be.

Also gaps exist between IARCs and NARCs. NARCs hardly use the varieties from IARCs in their programs.

### How to narrow the gap?

Give researchers an incentive to interact with farmers. So less focus should be put on being published.

A second thing that needs to be done is to change the attitude of researchers; they should treat farmers more like equals; people they can learn from.

How to spread knowledge/innovations from one place to another?

Mr. Reij's answer was simple and short: Farmers in a bus. In other words, don't get the innovation to the farmer, but the farmer to the innovation. If that's a field of a farmer-innovator, or a research station doesn't matter.

A second way would be to employ mass-media. Every farmer has a radio, so that can be used.

Extensionists can act as facilitators in this process. But they are generally underfunded, and focus on cash crop production, not on smallholder subsistence agriculture. NGOs have a role to play as a substitute for national extension services, and have done so occasionally.

Partnership

According to Mr. Reij, a partnership should not be large. Smaller partnerships are preferable. Also, not between institutions, but between individual researchers, to ensure good researchers participate.

Farmers do not necessarily need to be included. They only should be in if research is to be demand-driven. Researchers should visit farms, but if the main task is e.g. to quantify secondary benefits, they do not need to in the partnership, as it's not a demand driven research topic.

Comments on the Millennium Villages and Sasakawa-Global 2000 (SG2000)

MV targets just one village, so that's a): unrealistic, you're never going to scale it up, unless you've got massive funds. b) it's a good way to create social tension, as the villages next door will become jealous of the MV. The SG2000 proposes one solution to many local problems, this is not good.

Researchers do not come up with innovations he says, farmers do. Researchers should validate these farmer initiatives.

Examples of good innovations are Agro-forestry in Niger, and SWC in Burkina Faso.

## Interview with Han van Dijk

05-06-2009

### Introduction

Trained as forestry engineer and anthropologist, did research in Mali, how pastoralist dealt with the 1970s drought. Also did large study on the impact of climate change on local level for the whole of West-Africa, but climate variability turned out to be a bigger problem. Look at political instability as extra factor, in Chad.

Agricultural research is very much focused on an idea that you control the environment to manipulate them to produce food. But in drylands you do not have this control, especially with rainfall. This is also why research had not invested much in the dryland cropping because they consider it too difficult. Or it is like in the US about large scale farming.

There are a number of studies where people specifically tried to find out more about dryland farming. Many factors (like, soil moisture and fertility, farmer capacities and health, rainfall, birds, pests, locust plagues) make the highly variable yield, even within a village in the same conditions. (We know very little about this but the farmers know maybe more.) Difficult to integrate this in research.

Researchers are more interested in better controlled environment → high productive areas. While food security is higher in dryland areas. So researches are more south where productivity of the land is higher, and in the area where the food security problems are the highest there is the lowest density of agricultural research. Also gives economic boost.

In Niamee was a research institute of ICRISAT did a systematic study about cropping methods, with hedges, trees, etc. To see which system would yield the highest productivity and what kind of factors were the cause of variation. Only significant determining factor turned out to be rainfall.

NGOs do their own research, they try out different crop varieties and technologies, work parallel with researches, not together. Not much communication between them.

All kind of government services, infrastructure, is very weak, almost absent in dryland areas. This makes it difficult to have information from the field. EWS data is collected by civil service who have no knowledge on agriculture, and don't know how to interpret it.

Up to 1995 most research was oriented at biological production systems, these said, they are doing the wrong things: they overstock. Researchers didn't take the variability into account. An focused on carrying capacity. From this destocking policies came, but that would mean that about 80% of the people should stop livestock keeping. These studies also said that this way of livestock keeping would damage the ecosystem. Is not true, ecosystem recovers after drought.

Rain fluctuates and desert moves up south and up north again.

In 1980s ploughs were introduced and allowed farmers to go more up north to cultivate land. They could take the risk because they had a larger area. So farming expands into pastoral areas → conflicts.

Research should study how local farmers farm. How do they deal with rainfall variability? What do they do if the rain is very late, do they go to the city or work with livestock?

Researchers need to be present in those areas. Even if the government says researchers to do something, the attitude might still be like that this is not interesting, it is so variable we can't understand it. For example the WARDA investigated in Mali in flood rice cultivating in Niger area. After 3 years time they said we can't handle this variability and the building was closed. The attitude of researchers is very important, but they said we can't control the flood. While rice is their major crop, people prefer this local rice, and worth more money on the market. 1,5-2 million people live there

Researchers say it is impossible to cultivate millet at the border with Mali, in 200mm rainfall area. But those people do, and we engineers can't, so farmers are more performant than we are.

So let's study what they do. And then we can maybe find ways of introducing more drought resistant crop into this systems. And test if drought resistant crops in one area will also grow in a area with higher rainfall, but other difficulties. And there are also more disease resistant millet varieties, but nobody is interested because there is no commercial interest.

Drought and pest resistant have most priority for farmers. Economics are saying that there is soil degradation. But there is also a risk in high soil fertility, crop failure is also high. Because if there is good rain too so you produce a lot of biomass. But if there is an inter-seasonal drought, this big crop needs much more water than a small crop. So where crops are growing very well, they are more susceptible to drought. So this cut off point between soil fertility and rainfall and the risk involved in rainfall variability is a very important thing to study. And often farmers manipulate soil fertility, from a study in Niger, they throw all the manure on one part of the field and the other part they don't. then they sow their crop, and when the rainfall is high they harvest here, when the rainfall is low, they harvest less, but they harvest there. But if you do all of it with manure and you improve soil fertility then you maybe don't have a harvest at all. Farmers are very skilled in manipulating these, and we don't know how they do it. We know a little but we need to expand this basis of knowledge.

Governments have cut back budgets for research, so research should be left to the market. But that means that only market parties that have capital can demand research. But farmers are not the ones with capital to demand for research. So we need to invest again in public funding for research. If you look at the world scale, private companies invest maybe ten times as much in agricultural research than public agencies like government or international community. But if you have indeed public funding this should create partnerships with NGOs working all over the place which have good contacts with farmers. This can be a basis to acquire again a basis in the country side in dryland. From the donor countries much more emphasis should be in these marginal areas. It's easier in already high productive areas, they have to show to donors that they reduce poverty, in dryland it takes much longer and more effort. But if you look at poverty and human suffering dryland should be priority. Because 80% in these areas lives below poverty line. Therefore re-orient your development strategy to these areas. But most donors, governments NGOs consider these areas as too difficult.

The change could start at the level of the Dutch government or the FAO.

A lot of money has invested already but probably with the wrong assumptions, that indeed you can improve agriculture by soil fertility (also risk) instead of drought resistance. But the right strategy has not been thought out yet.

It's hard to work for students in Niger, language problem, no infrastructure to house students there, to help student there, no supervision. So if there is no research station to support you there, then how to do it.

## Interview with Dr. Ir. Jan de Graaff

11-06-2009

### Introduction

Professor at the Land Degradation and Development department of Wageningen University and Research Center.

### participatory approaches

Mr. De Graaff thinks participatory approaches are useful to identify issues for research. In the past, the CGIAR institutes often did not work as coherently. CIMMYT would make a new variety, but that could conflict with the crops another institute developed. ISNAR institute was created for this, but it was dissolved after fifteen years, in 2004.

The work to strengthen "research-extension" linkages has continued (e.g. the world bank supported training and visit program), but often good results were lost due to lack of funds.

### researcher attitude

Often farmers and researcher don't connect too well. Farmers can look up to researchers, and not tell them everything they know. The risk is the researcher tells a lot of stuff, and the farmer continues doing whatever he was doing as soon as the researcher leaves.

### need for harmonization

Does Ethiopian policy on land tenure conflict with SWC priorities?

Land tenure policy is certainly a big issue affecting investments. Since the Derg, several land reforms have been performed; generating insecurity about any claims to the future income flows resulting from presents investments. This means that farmers are unwilling to e.g. build terraces on their land.

### important issues

The inheritance system matters: in some countries land is divided between all sons, creating small farms that are not viable.

In areas where wood is scarce, manure is used as fuel, not as fertilizer. Agro-forestry could help here, but if there aren't any trees at all, and livestock eat whatever grows, this is hard to realize.

Per hectare yields are dropping in Ethiopia.

### How to scale up success stories?

In Burkina Faso stone bunds were successfully reproduced all over the country. They were adopted first in one region, and through the help of NGOs spread to a wider area. The role of researchers remained unclear; NGOs do employ researchers that do good work. Local universities should focus more on their home region. Mr. De Graaff mentioned the example of the US, where each state has its own university, the agricultural departments of which strongly contribute to the development of local agriculture.

### Is there need for partnerships between European and African universities

These partnerships already exist; Wageningen used to have support points on every continent, but has replaced this strategy. They now sign 4 year long partnerships with foreign universities in which PhD students are trained. e.g. the RESPONSE program with Mekele university, or a program in Benin for which the graduation ceremony even took place in Benin, with Wageningen's rector attending. According to Mr. De Graaff it is not really needed to expand this policy to a EU level, he does not see much added value.

Farmers mostly care about short term profitability. Some SWC measures combine short-term impact with long-term impacts. The stone bunds in BF are a good example; the farmers liked them because they improve water retention, increasing yields from season , but they also help increase soil fertility, which has a positive long term impact.

## Interview with Wim Goris of Agri-ProFocus

03-06-2009

### Introduction

Agri-Pro Focus the word is derived from focus on agriculture producers. We are Dutch platform or partnership for agriculture development and agriculture all members do work with agriculture development, our current strategic plan focus on farmer entrepreneurship, which implies self organization as farmers need to bulk their produce in order to get market power: our activities in three areas value chain developments, access to financial and services and product and sustainable food production the later had to do with link with food security and the livelihoods. Respect for gender balance is a key criterion for all three themes, also because not all farmers can take risk against market exposure.

Agri-Pro Focus responded to the recent there strong call from Accra Agenda and the Dutch Minister for Development Cooperation- for more collaboration and less segregation among development cooperation actors By providing a network for joint action and learning.

People who produce for the market and who they don't are in our focus, We believe that every body produce for the market and every body is under influence of the market even if you produce for himself

Agri-ProFocus partnership stands for new ventures, new dynamics and for organizing development cooperation beyond the boundaries of individual . We were established 4 years ago, there was need felt of organizing the support to agriculture and agricultural organizations as it suffered from marginalization if you look at the political agenda.

### Examples of joint projects

#### Dairy production support in India

Wim Goris gave the example of Agriterra (which provides capacity building and technical support but no finances) cooperating with Oiko credit to provide the financial investment (for a milk cooling installation).

#### Learning cluster in Ethiopia

Five Dutch NGOs and two Ethiopian NGOs have organized a three year joint learning program for 17 producer organizations (farmer representatives) and 10 of their service providers. Workshops (discussing financial services, how to relate with other chain actors etc), coaching visits by experts, assignments and an end contest (real business proposal) enable the participants to improve their entrepreneurial skills, market-oriented production and quality assurance.

#### Pastoralism in Ethiopia

Dutch NGO Cordaid is working on Disaster Risk Reduction in Southern Ethiopia, teaching pastoralist how to adapt to climate change. Cordaid approached Agri-ProFocus to work together on the marketing of livestock. However, Agri-ProFocus also knows researchers from Van Hall Larenstein (Robert Baas) who have data that would challenge Cordaid assumptions about pastoralism. Bringing NGOs and researchers together could test the assumptions that the NGOs have.

### Gap between field and research

Action research on pro poor dev of value chains, implemented by LEI (Sietze Wellema, Gerdien Meierink). Lot of research, but do not see impact on smallholder income. How to include smallholders into value chains? Need to choose specific chain, works well in Uganda and Ethiopia, choose sesame (Northern Ethiopia). Also introduced the concept of contract farming, not known yet in Ethiopia.

People from Wageningen UR are very open to relate their research to practitioners.

### Farmer Field Schools

Contact Arnoud Braun, he is the coordinator of farmer field school (digital) network.

## Partnership

The partnership got started thanks to political leverage to address fragmentation and call (from the Dutch Ministry of Dev. Coop.) for more coordination.

Agri-ProFocus started building its network by arranging expert meetings, trying to establish a community of professionals. These activities link people from different organizations working on the same topic and/or country. Joint projects brings the partnership a level deeper (see examples). The support office also runs a question and answer service. It also directs questions from private companies to relevant NGOs.

Partnerships used to be very top down, WUR working with foreign university, they work with producers. Dutch NGOs are the intermediaries between farmer organizations and donors, because farmer organizations do not have the skills to conform to the requirements of donors. In order to strengthen the farmer organizations, the NGOs should first be cooperating better. More coordination between all organizations supporting farmer organization (incl. Ethiopian government and their many extension workers) is needed for the future. Perhaps also by arranging expert meetings (in Ethiopia).

Agri-ProFocus started by strengthening cooperation between Dutch NGOs. They also want to increase cooperation between farmer organizations in developing countries.

Researchers can provide the argumentation and proof why policies should be reconsidered. For instance, the Ethiopian government leases the best lands to foreign investors (Chinese, Saudi, biofuels) while these lands are crucial to pastoralist, especially in times of severe drought.

## Partnership with the private sector

Private partners might not care too much on which country, they focus on specific products. Working in value chains makes you focus on product first. Private partners focus on median and large farmers, near the capital, near roads. Whereas development workers start with selecting the poorest, those who lack access to credit and market opportunities.

When people are in an environment that does not support market opportunities you focus on sustainable food production, for own consumption, off farm income opportunities, food for work and social safety nets. This requires a very different network, you approach the Relief Department instead of the entrepreneurship department of an NGO.

Agri-ProFocus started with a focus on bulking farmers' produce to strengthen their position and proportion of the value chain. But a value chain approach will not work for all farmers because for instance for some the transport costs would be too high therefore it would not be a useful investment. They are starting a discussion on how to link food aid and market production, because after a few months of food-for-work farmers are supposed to produce for the market again.

## Advice on partnerships

CTA should become a member of Agri-ProFocus.

Focus on specific countries. Get an overview of who is doing what in Ethiopia, the Agri-ProFocus report on this will be ready in August. Connect needs and offers from Dutch members. To do this workshops will be held in Ethiopia and farmer representatives will be present to respond to the suggestions and assumptions of policies. In this way actors like NGOs and researchers can be open and check their own assumptions. Provide an environment to focus on Ethiopian farmers. Look for people (within NGOs) who do not just want to follow their own routine, get something new started.

Similar to Dutch hospitals, everything used to be organized around the agenda of the doctor. This has changed to a focus around the patient, the doctors work together around the patient.

What is needed is a reconfiguration around the farmers entrepreneurs. Reorganize how we work together (Dutch NGOs and all actors in Ethiopia) in the enabling environment around the farmer (practitioner). Bring everyone together and have an open dialogue of what works and what to abandon. Those who give a lot in the partnership get more results.

Interesting document on partnership: 'Building North South Partnership for a better world' Katrien Termeer, Joost Oorthuizen en Thea Hilhorst) available online.

## Interview with Prof. Dr. Ir. Akke van der Zijpp

25-05-2009

### Introduction

Professor at the Animal Production Systems department of Wageningen University and Research Centre.

### Most important dryland issues/problems

Climate change > vegetation change > change in livestock, move from cattle to sheep, goats and camels. Crops (Ethiopia) move from teff and maize to sorghum and millet. Strategic conservation of water.

Consumer demand pushing changes, biofuels can be option.

### Success story

Example of Hedges in Burkina Faso (5 years to grow) subdivision of plots

Bushes: water binding capacity and compost, manure utilization due to root system.

Livestock kept out, contained around the house, collect manure.

Many implements, even tractors so much funding

Need market to buy trees, not yet developed in Eth.

In Eth farms too small, do not want to plant trees.

Lack of resources.

Different people might adopt hedges, better educated might leave to go to the city.

SILLS or CILLS (in French)

IDRC Canada (in Ethiopia) building ponds, but drowning of children and animals

Dams (Ethiopia) build by food for work. Cabbages, all grow same crop, market overload.

Need market at reasonable distance.

Well-off farmers bought pump and grew on collective land, were told to stop

Much livestock brought to reservoir > manure > algae

Need regulation

Gap farm – research

In Ethiopia farmers rely on info from Agricultural Bureau extension workers, many were trained. Farmers often over 50, illiterate depend on oral communication, radio, information centres with tv and demonstration plots.

Adoption is inherent to household factors: labour, resources (land, capital), long term interest in farming or in something else (migration)?

Access to credit.

Ethiopian farmer cooperatives are important but too much government controlled.

ILRI: basic research on research opportunities. Identify different groups, choose poorest. Identify problems in values chains to address. Poverty in relation to livestock kept. Work together with farmers associations.

Build road so now can produce dairy, than need fodder for animals, do you grow alfalfa or is crop residue enough.

Priority should be: roads, look for markets that can be developed, near expanding cities.

Research policy setting:

Ethiopian governments' priority: Intensification, Dairy, Beef, Sheep

Top down, export oriented

Focus on east (sheep) and west (beef to Khartoum). Trading system difficult, not clear on quality requirements, farmers want to sell old traction animals.

Should focus more on local markets, local quality requirements less costly.

Behind governments: policy of international institutions. 1995-2005 poverty reduction policy based on economic improvement. Written by consultants not by countrymen, not accepted, not known.

Gates Foundation: likes value chain, focus on income generating activities, pay for school, health care. Fund NGOs with particular expertise. Invest in local knowledge. Very strong on evaluation.

Land rights

Need access to land, hiring impedes investment. Many people (kenia) put up fences, leftovers for migrating livestock in exchange for manure, now kept out: conflict. Overgrazing: herd size not reduced because of bank function. Fenced land also suffers from degradation around.

Government wants to plant trees, keep livestock out. Check FAO environmental services.

Relation between crop research and animal research

Test for drought resistance

Government was not producing seeds for animal fodder, sudden demand for this

In Kenya intensification led to animal diseases

During Green Revolution rice was selected on basis of nr of grains, but it is the residue that is important for animal fodder. You can find in gene bank types that have many grains plus good energy protein residue for fodder.

More consumer demand for dairy and meat so producing good feed is now important.

Specific interventions for animals: veterinary services in Ethiopia

In Ethiopia the veterinary school in Debraseit is expanding, but still shortage of veterinarians. Also vaccine production unit in Debraseit, so good facilities in Ethiopia. But service in the field is limited.



**International Workshop: Learning,  
Producing and Sharing  
Innovations: Tools for co-  
construction and sustainable  
implementation of innovations in  
Dryland Africa (APPRI),  
Ouagadougou, 21-24 October 2008  
(<http://appri2008.cirad.fr>)**

Summary of the results obtained

*Coordinator: Danièle Clavel  
([clavel@cirad.fr](mailto:clavel@cirad.fr))*

The APPRI2008 workshop was a CIRAD initiative derived from the UE-FP6-AIDA Project<sup>1</sup> in which objectives was programmed in a complementary manner to comply, in particular, with the early finding that the multi stakeholder's co learning is a central for an innovation to be a success.



The workshop was designed in collaboration with IRD, INERA and CPF (*Confédération Paysanne du Faso*) with financial support from *Agropolis Fondation*,

CTA and the French Embassy. It was attended by 50 participants from Burkina, Cameroon, Ethiopia, Ghana, Guinea, Mali, Niger, Senegal, Sudan, Tanzania, Kenya and Brazil. They came from professional farmer organizations, NGOs, and research and training organizations operating in the drylands of Africa<sup>2</sup>.

The main aim was to analyse conditions for implementing alternative action-research practices in partnership for development, taking into account the difficulties of "official" research and of the rural world, faced with the major challenges of sustainable development in the South. One originality of APPRI2008 was to compare experiences in the rural zones of Africa, presented during the workshop, with those of the UNICAMPO Peasants' University set up 10 years ago in the Brazilian Nordeste, a semi-arid region where farms exhibit some major similarities with those in the drylands of Africa.

The "**Peasants' University**" concept was unanimously chosen as a place to unify partnership initiatives bringing together research, rural development officers, farmer organizations and producer groups, and rural communities and municipalities. These **Peasants' Universities** will be places of learning where a common vision is shared for implementing development and environmental improvement activities,

<sup>1</sup> AIDA Project INCO N° 2006 043863,  
<http://www.open-si.com/>

<sup>2</sup> <http://hal.cirad.fr/cirad-00399207/fr/>

particularly intended for small family farms.

The **APPRI2008 group** unanimously accepted that technical and institutional innovation in partnership is paramount. It needs to be co-constructed from local know-how and scientific and technical knowledge. Information and communication between all those involved in development needs to be revised and strengthened, in order to be more interactive and more efficient. The aim is not only to improve agricultural production but also to contribute to cultural recognition and participate in the social and economic transformation of rural communities.

The action to be promoted through these universities is intended to enable rural African communities to take on board innovations, notably through:

- the construction of **exchange networks based on a core of APPRI2008 resource-persons made up from the stakeholders present**,
- strengthening of capacities and training for all innovation stakeholders, including researchers,
- co-learning for researchers, developers, farmers and rural populations,
- drawing up of the content and dissemination of appropriate scientific documentation and information that is decentralized and combined with local know-how.

The Peasant's University is construed as a social innovation, a place for the convergence of know-how, using an "**innovation caravan**" as the central strategy for mobilizing local, national and international solidarity, exchanges and capitalization of know-how. The tools to be developed by the caravan will notably be:

- identification of active and operational rural groups,
- assistance in formulating and

expressing needs, and gathering proposals,

- collective drafting of a charter listing the principles for implementing concrete projects,
- discussions about projects, difficulties encountered and strategies adopted locally,
- thoughts about project monitoring-evaluation systems,
- dialogue with local, traditional, municipal and national authorities,

proposed actions for exchanges, adding value and education: exhibitions, forums, itinerant, open and remote training.



## CTA - AIDA Partner 8 - Survey Report among policy makers on “Investing in Africa’s Drylands – Key Drivers of Success”

J. Francis<sup>1</sup> & Y. Kebede<sup>2</sup>

### Objectives

The main objectives of the AIDA project were to identify key drivers of success in dryland agriculture; propose policy options for investments and sustainable development of Africa’s drylands and share success stories with all stakeholders. One of the activities conducted to achieve these objectives was a survey among key policy makers to assist in determining priority interventions. The main objective was to get their opinions on the following questions:

- How are the priority areas for drylands and the related policies and interventions decided?
- How do they define success in general and more particularly for dryland agriculture and which indicators are used to measure them?
- Are there success stories and partnerships in drylands areas that they are aware of?
- What are their top three priority areas for investing in drylands areas to make agriculture in drylands’ Africa a success?

### Methodology

A survey questionnaire, comprising eleven questions, was developed in English and French and further refined in consultation with AIDA partners and CTA staff (see Appendix 1 & 2). The survey was sent out by email to 61 organizations together with a personalized covering letter signed by the CTA Director. The organizations consisted of embassies, ministries, and national research centers, regional and international organizations and networks, NGOs and AIDA partners. The summary distribution lists for the questionnaires by type of organization and the responses by number and percentage, received are provided in Table 1.

**Table 1 – List of Organizations Contacted & Response Rate**

Type of organization	No. Contacted	No. of Answers received	% Rate of response
Embassies	15	0	0,0
Ministries and national agricultural research centers	11	3	27.3
Regional and international organization and networks	21	5	23.8
NGOs	7	4	57.1
AIDA partners	7	2	28.6
<b>Total</b>	<b>61</b>	<b>14</b>	<b>23.0</b>

As a follow-up to the emails, several phone calls were made:

<sup>1</sup>Judith Ann Francis, Senior Programme Coordinator, S&T Strategies, CTA & <sup>2</sup>Y. Kebede, Intern & Junior Consultant, CTA S&T Strategies, Programme.

- First, to make sure that the questionnaires were received and that the persons were willing to participate in the survey; and
- Subsequently, as a reminder.

One of the major constraints encountered in conducting this survey was in obtaining responses from the embassies because the contact person was most of the time not reachable.

## Results

The responses are captured and summarized by type of organization namely; national research organizations (KARI –Kenya, Kenya Agricultural Research Institute, Ethiopian Institute of Agricultural Research, EIAR - Ethiopia & ISRA Senegal, Institut Sénégalais de Recherche Agricole), regional and international organizations (Desert-Net, Drylands Coordinating Groups, CILSS, IFPRI, GTZ) and AIDA partners (FARA & AGRYHMET) to facilitate comparison (see Appendix 3). The number of answers received was not enough to make any statistical analysis. However, certain key issues were noted.

1. Almost all respondents considered dryland issues a priority for their organization and those who did not provide support for other organizations working on dryland issues.
2. Most organizations considered food security, poverty reduction, climate change and fighting desertification as priorities for Africa's drylands.
3. With respect to the criteria used to decide on policies, priorities and interventions, most respondents use a consultative process mainly through face to face meetings involving many actors including government officials and dryland people or the results of their research or project evaluations.
4. Success was defined in many ways including; improvement in human well being and standard of living, reduction in vulnerability and poverty, provision of adequate food, and significant change as a result of project interventions that is considered positive by the beneficiaries.
5. With respect to defining success in drylands, respondents identified; maintenance of goods and services, sustainability of dryland ecosystems, enhanced water and soil conservation techniques and breeding of drought-tolerant and resistant crops.
6. The elements for achieving success included adopting participatory approaches to research, promoting investments including assisting small holder farmers technically and financially, not applying a blue print solution and involving dryland people, and focusing on water harvesting, agroforestry and reforestation techniques/strategies.
7. The indicators for measuring success touched on environmental, social and economic indicators such as extent to which land degradation is decreased; increases in well being of the dryland people (e.g. income & health), increases in agricultural yields e.g. for staple foods & livestock production, improvements in ground water levels.
8. Respondents were also able to identify success stories and successful partnerships in Africa's drylands.
9. The top three priorities for achieving success in Africa's drylands as identified by respondents varied and encompassed a range of issues including promotion of integrated, applied, participatory long term research; developing commercial trading systems for products produced in drylands; promoting water and soil conservation; reforestation; establishing institutional arrangements for land use by farmers and pastoralists; support for education and training and infrastructural development.

## Conclusions

The survey results, though not statistically analyzed, demonstrate that dryland issues are a priority for several major national, regional and international organizations and provide valuable input into identifying policy options for investing in Africa's drylands. These responses contributed to the articulation of the AIDA policy brief.

<sup>1</sup>Judith Ann Francis, Senior Programme Coordinator, S&T Strategies, CTA & <sup>2</sup>Y. Kebede, Intern & Junior Consultant, CTA S&T Strategies, Programme.

## Appendix 1: Questionnaire in English

List of questions for the consultation on “Investing in Africa’s Drylands – Key Drivers of Success”

Dryland Africa (annual rainfall between 100 and 1000mm) is faced with many challenges, such as poverty, food crisis, water shortage, soil erosion, land degradation and desertification. 43% of Africa’s land mass is impacted; mainly the Sahel countries, Greater Horn of Africa and several countries in Southern Africa. 268 million people (40-41% of the continent’s population) live in dryland areas. CTA is responsible with seven EU and African partners for implementing the EU-funded project AIDA (Agricultural Innovations in Drylands Africa, Project No- 2006-043863) which falls under the Specific Scientific International Scientific Cooperation Activities (INCO) of the EU and which is coordinated by the French Agricultural Research Center for International development (CIRAD). The project partners are the AGRHYMET regional centre (Niger), CIRAD (France), CTA (The Netherlands), FARA (Ghana), PRI Wageningen University and Research centre (The Netherlands), RUFORUM (Uganda), University of Malawi, Bunda College and the University of Nairobi (Kenya). The partners are seeking to identify key drivers of success in dryland agriculture; propose policy options for investments and sustainable development of Africa’s drylands and share success stories with all stakeholders.

### Questionnaire

#### Type of organization:

- Ministry
- Embassy
- International Organization
- International Policy Network
- Regional Policy Network
- International Research Centre
- Local Governmental Agency
- International NGO
- University
- National research Organisation

**Country or region covered:** .....

**Date:** .....

### Dryland Priorities & Policies

1. Are dryland issues a priority for your:

- Organization – Yes/ No: .....
- Country or region – Yes/ No: .....
- Government? – Yes/ No: .....

If yes to any of these questions, go to question 2. If no go directly to question 3.

2a. If yes, what are these priorities and how were they identified by your:

- Organization: .....
- Country or region: .....
- Government: .....

2b. Are any of these priority issues for dryland people / dryland farmers/ pastoralists?

<sup>1</sup>Judith Ann Francis, Senior Programme Coordinator, S&T Strategies, CTA & <sup>2</sup>Y. Kebede, Intern & Junior Consultant, CTA S&T Strategies, Programme.

.....  
.....

2c. How did your organization/country or region/government get to know the priorities of dryland people and for drylands farming?

- Organization: .....
- Country or region: .....
- Government: .....

2d. What criteria were used by your organization/country or region/government agencies (s) to decide on the priorities in drylands?

- Organization: .....
- Country or region: .....
- Government: .....

3. How does your organization/country/government develop related policies or interventions areas for drylands?

- Organization: .....
- Country or region: .....
- Government: .....

**Defining Success**

4. In your opinion what is success? Define.

.....  
.....

5. What would you consider as success in Africa's drylands? Can you give examples?

.....  
.....

6. In your view, what are the essential elements to achieve success in Africa's drylands?

.....  
.....

7. What indicators can be used to measure success in Africa's drylands?

.....  
.....

8. Are you aware of any success stories in Africa's drylands? Yes / No

If yes, please give examples.

<sup>1</sup>Judith Ann Francis, Senior Programme Coordinator, S&T Strategies, CTA & <sup>2</sup>Y. Kebede, Intern & Junior Consultant, CTA S&T Strategies, Programme.

.....  
.....

9. Are you aware of any successful partnerships on drylands issues e.g. government-government partnerships, public-private partnerships, research partnerships (national or international) or African-European partnership? If yes, please give examples?

.....  
.....

10. If you had to give advice to your organization or government /region for investing in Africa's drylands, what would you recommend as the top three priorities to achieve success?

- Priority 1: .....

- Priority 2: .....

- Priority 3: .....

11. Are there any additional thoughts that you would like to share with us?

.....

Name (optional) .....

Position (optional) .....

Please return this questionnaire by email to Judith Ann Francis ([francis@cta.int](mailto:francis@cta.int)) in copy to Yodit Kebede ([kebede@cta.int](mailto:kebede@cta.int)).

<sup>1</sup>Judith Ann Francis, Senior Programme Coordinator, S&T Strategies, CTA & <sup>2</sup>Y. Kebede, Intern & Junior Consultant, CTA S&T Strategies, Programme.

## Appendix 2 : Questionnaire in French

Liste des questions relatives à l'étude «Comment répondre à la nécessité de développer des partenariats Afrique-Europe sur les questions des zones arides »

Les zones arides d'Afrique (précipitations annuelles comprises entre 100 et 1000 mm) sont confrontées à de nombreux défis, tels que la pauvreté, la crise alimentaire, la pénurie d'eau, l'érosion des sols, la dégradation des terres et la désertification. 43% du continent Africain est affecté, en particulier les pays du Sahel, la Grande Corne de l'Afrique et quelques pays d'Afrique australe. 268 millions de personnes (40-41% de la population du continent) vivent dans les zones arides. Le CTA est responsable avec sept partenaires de la mise en œuvre du projet AIDA (Projet Inco N°-2006-043863) sous l'égide des activités de Coopération Scientifique Internationales particulières (INCO) financé par l'Union Européenne et coordonné par le Centre français de coopération internationale en recherche agronomique pour le développement (CIRAD). Les partenaires du projet sont le Centre régional AGRHYMET (Niger), le CIRAD (France), le CTA (Pays-Bas), le FARA (Ghana), le PRI du Centre universitaire et de recherche de Wageningen (Pays-Bas), RUFORUM (Ouganda), l'Université du Malawi (Bunda College) et l'Université de Nairobi (Kenya). Les partenaires cherchent à identifier les facteurs clés de succès dans l'agriculture des terres arides afin de les communiquer à tous les acteurs concernés et d'orienter les choix politiques en matière d'investissements et de développement durable des zones arides en Afrique.

### Questionnaire

#### Type d'organisation :

- Ministère
- Ambassade
- Organisation internationale
- Initiative internationale à caractère politique
- Initiative régionale à caractère politique
- Institut de Recherche international
- Agence Gouvernementale Locale
- ONG Internationale
- Université
- Institut de Recherche Nationale

**Pays or région concerné :** .....

**Date:** .....

#### Les priorités et politiques pour les zones arides

1. Est-ce que les problématiques liées aux régions arides font partie des priorités de votre :

- Organisation – Oui / Non: .....
- Pays or région – Oui / Non: .....
- Gouvernement? – Oui / Non: .....

Si vous avez répondu oui à l'une de ces questions, merci d'aller à la question2, sinon veuillez vous reporter à la question3.

2a. Si oui, quelles sont ces problématiques prioritaires et comment elles ont été identifiées par votre :

- Organisation: .....
- Pays or région : .....

<sup>1</sup>Judith Ann Francis, Senior Programme Coordinator, S&T Strategies, CTA & <sup>2</sup>Y. Kebede, Intern & Junior Consultant, CTA S&T Strategies, Programme.

- Gouvernement: .....

2b. Ces questions prioritaires concernent-elles les agriculteurs ou les habitants des régions arides ?  
 .....  
 .....

2c. Comment votre organisation / pays ou région / gouvernement est informé(e) des questions prioritaires pour les habitants des régions arides et l'agriculture en région aride ?

- Organisation:.....
- Pays or région : .....
- Gouvernement: .....

2d. Quels sont les critères utilisés par votre organisation / pays/ gouvernement pour déterminer les priorités des les régions arides ?

- Organisation:.....
- Pays or région : .....
- Gouvernement: .....

2. Comment votre organisation / pays / gouvernement élabore-il/elle des politiques ou fixe des domaines d'interventions pour les régions arides ?

- Organisation: .....
- Pays or région : .....
- Gouvernement: .....

**Définir un succès**

4. Qu'est-ce qu'un succès ? Veuillez donner votre définition.  
 .....  
 .....

5. Que considérez-vous comme un succès dans les régions arides d'Afrique ?  
 .....  
 .....

6. Quels sont les éléments que vous considérez comme indispensables pour réussir en régions arides d'Afrique ?  
 .....  
 .....

7. Quels indicateurs peuvent être utilisés pour mesurer ces succès dans les zones arides d'Afrique ?

<sup>1</sup>Judith Ann Francis, Senior Programme Coordinator, S&T Strategies, CTA & <sup>2</sup>Y. Kebede, Intern & Junior Consultant, CTA S&T Strategies, Programme.

.....  
.....  
8. Connaissez-vous des exemples de pratiques réussies en zones arides d'Afrique ? Oui / Non

Si oui, merci de donner des exemples :

.....  
.....  
9. Connaissez-vous des exemples réussis de partenariat sur les questions des régions arides ? Par exemple, au niveau de la coopération bilatérale ou multilatérale, la coopération intersectorielle (secteur publique/privé, institutions de recherche) Si oui, merci de donner des exemples.

.....  
.....  
10. Si vous deviez donner à votre organisation, pays ou région, ou votre gouvernement des conseils afin qu'elle/il investit dans les zones arides d'Afrique qu'est-ce que vous recommanderiez comme étant les trois points prioritaires pour réussir en régions arides d'Afrique ?

- Point 1: .....
- Point 2: .....
- Point 3: .....

11. Auriez-vous d'autres remarques ou suggestions à nous faire part?

.....  
.....  
Nom (Facultatif) .....

Fonction (Facultatif) .....

Merci d'envoyer vos réponses par email à Judith Ann Francis ([francis@cta.int](mailto:francis@cta.int)) en copie à Yodit Kebede ([kebede@cta.int](mailto:kebede@cta.int)).

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**Answers received for the survey on**  
**“Investing in Africa’s Drylands – Key Drivers of Success”**  
**By type of organization**

**National Agricultural Research Centers**

Question		Institut Sénégalais de Recherche Agricole (ISRA, Senegal)	Kenya Agricultural Research Institute (KARI, Kenya)	Ethiopian Institute of Agricultural Research (EIAR, Ethiopia)
1	<b>Are drylands a priority for</b>			
	the organization	yes	yes	Yes
	the country or the region		yes	Yes
	the government		yes	yes
2a	<b>What are the priorities / how are they identified?</b>			
	for organization	Poverty, food security and energy, environmental and ecosystem degradation. Identified by national policy and by a participatory method with farmers and inhabitants of these areas	Dryland crop production Soil and water management Range and Arid lands management/ livestock production Identified thorough consultation with stakeholders/policy documents/ experience	Improving Agricultural production to achieve food security Alleviate poverty with a focus on NRM in participatory approach in dry areas problem and priorities identified on need based approaches

	for country or region		Livestock production and range management Crop production/ Irrigation agriculture Infrastructure development (roads, water etc) Identified through consultation with all stakeholders/policy documents	Same as above, but with wider perspective covering all agro ecologies and farming systems
	for government		Improved livestock production and range Management Dryland crop production /irrigated agriculture Infrastructure development (roads, water etc) Identified through consultation with all stakeholders/policy documents	The Government main policy is to improve agricultural production and enhance the overall economy in participatory manner in the dryland ecosystems through capacity building and allocating resources
<b>2b</b>	<b>Priorities for drylands people/drylands farmers?</b>		yes	Yes, the key research and development priorities are for the dryland farmers, pastoralists, and dryland people in general currently there is a closer attention, but in the past they were marginalized.
<b>2c</b>	<b>How do you get to know priorities of drylands people?</b>			
	by organization	By regular consultation between the organization, farmers and inhabitants and also by the national development policies	Long term experience and interaction working in drylands Stakeholder consultation	It is mainly, due to the participatory approach, involving people in identifying their problems and priorities in research and development
	by country or region		Long term experience and interaction working in drylands Stakeholder consultation	Through the concerted efforts of the research staff working in dryland agricultural research. The strategy has been developed and priority areas set
	by government		Long term experience and interaction working in drylands Stakeholder consultation	Food security and environmental degradation, climate changes have been the major issues that are brought to the attention of the government by different. Stakeholders

<b>2d</b>	<b>What criteria are used to decide on priorities ?</b>			
	by organization	Cost/benefit methods Level of potential local development Level of partnership Impact on income integrated development Identification in local plan for development	Major economic activities in the drylands Critical challenges limiting production and improved livelihoods Potential for improving livelihoods and food security	Identification of problems, priorities for R and D in the dry areas, by researchers, development and extension workers and conducting workshops intuiting issues
	by country or region		Same answers	Through strategy developed based on the identified problems and priorities and formal and informal surveys
	by government		Same answers	Same as above
<b>3</b>	<b>How are policies and intervention areas decided?</b>			
	by organization?	Analysis of constraints and issues, by consultation identifying development orientations. The issues are then translated to research activities	Consultations with stakeholders Expert knowledge utilization Situational Analysis Scenario modeling/analyses and objectives	Through developing of research strategy based on priority areas and need based assessment
	by country or region?		Same answers	Same as above
	by government?		Same answers	Same as above
<b>4</b>	<b>Definition of success</b>	Find efficient and effective solutions to the issues by generating techniques and technologies and adapted and applied knowledge by farmers and which improve their standard or living	Success is the achievement of defined goals and objectives	Although not as expected research agenda for dryland areas are defined, capacity building is well in progress
<b>5</b>	<b>What is success in drylands Africa?</b>	An intervention which reduces poverty by 15%	Development of drought resistance crop varieties cowpea, millet, grain Development of technologies for water conservation and management. Conservation of wildlife areas – Kenya, South Africa etc	Through concerted efforts there are some success by way of improving the livelihood of the dryland people is certain African countries such South Africa

6	<b>Elements to achieve success in Africa's dryland</b>	<ul style="list-style-type: none"> <li>_ Inclusion of all stakeholders from the beginning to the end of the intervention</li> <li>_ Sustainability</li> <li>_ Differentiated approaches by ecological zones and by beneficiaries</li> </ul>	<ol style="list-style-type: none"> <li>1. Sustainable natural resource management- soil, water, vegetation etc</li> <li>2. Improved livestock husbandry and marketing</li> <li>3. Infrastructure development – roads, telephone etc</li> <li>4. Development and increased utilization of drought tolerant crops.</li> <li>5. Efficient utilization of available water for rainfed and irrigated agriculture</li> <li>6. Capacity building and empowerment of local communities including formal education</li> <li>7. Peace building/conflict management</li> </ol>	Develop appropriate research and development agenda focusing on capacity building for researches and development workers
7	<b>What indicators to measure success in Africa's Drylands?</b>	<p>Increase of per capita calorie consumption  Increase of the contribution to the GDP  Decreasing degradation  Increase productivity  Increase income  Increase social wellbeing</p>	<ol style="list-style-type: none"> <li>1. Social-economic wellbeing (health, education, incomes, peace etc)</li> <li>2. Environmental health and integrity</li> <li>3. Food production/productivity (crop and livestock)</li> <li>4. Reduced vulnerability to environmental calamities e.g. drought</li> </ol>	Income increase, change in livelihood and resilience and developing coping mechanisms in dryland areas
8	<b>Are you aware of any success stories in Africa's drylands</b>	<p>Agricultural research project I and II : increasing of rice productivity  Project NRBAR (USAID)  Project FNRA: bioenergy development</p>	<ol style="list-style-type: none"> <li>1. Livestock production in Botswana/South Africa/Ethiopia</li> <li>2. Wildlife conservation in Kenya and South Africa</li> <li>3. Food production through irrigation in Egypt/Sudan</li> </ol>	Yes - Countries such as South Africa, Kenya, Botswana, have enhanced the economy of dryland people.
9	<b>Are you aware of any successful partnerships on drylands issues?</b>	<p>PRA I et II multilatéralNRBAR coopération bilatérale Convention ISRA / SODEFITEX</p>	<ol style="list-style-type: none"> <li>1. Development of dryland crops (ICRISAT/CMMYT and KARI)</li> <li>2. Wildlife conservation (campfire and community wildlife conservancy projects)</li> <li>3. Cross boarder disease surveillance and management (EU – IBAR /ICAD</li> </ol>	Public institutions and private agents are now helping dryland people in the fight against poverty

10	<b>Top 3 Priorities to achieve success</b>	<p>In agriculture, better research results dissemination  Strengthening the capacities of the stakeholders  Stabilize production environment by implementing adapted policies</p>	<p>Improved and sustainable livestock production and marketing systems.  Efficient utilization of available water for rainfed and irrigated agriculture  Infrastructure development.</p>	<p>1/ Develop capacity for dryland agriculture to able to use modern technologies to do research such as GIS tools, remote sensing, and modeling</p> <p>2/ Make appropriate policy that is implementable based on the priority setting.</p> <p>3/ Allocate resources for dryland areas development.</p>
11	<b>Additional Comment</b>			

## Regional and international organizations and networks

Question		Desert-Net	Drylands Coordination Group	CILSS (Burkina Faso, Mali, Mauritanie, Cap Vert, Gambie, Guinée Bissau, Niger, Sénégal, Tchad)	IFPRI (Africa, Asia, Latin America and Caribbean)	GTZ
1	<b>Are drylands a priority for</b>					
	the organization	Yes	Yes	Yes	Yes	No but we do have several projects
	the country or the region		Yes			No
	the government					No, but supports UNCCD, dryland research etc
2a	<b>What are priorities / how are they identified?</b>					
	for organization	Encourage Research & promote concerted efforts in all issues of DLD and sustainable dryland development, Cooperation between scientists, policy and decision makers	Food security in the drylands of Africa is the main priority of our organization. We plan to contribute to food security by addressing issues of increased pressure on natural resources and conflict over and access to natural resources	Fighting against desertification, climate change, food security	Food security Poverty reduction	
	for country or region		Drylands occupy an important part of Ethiopia, Mali and Sudan and face many challenges such as climate change, vulnerability to disasters and agriculture which is mainly rainfed. Their inhabitants are often marginalized and do not benefit from governmental policies and national development programs			
	for government					

2b	<b>Priorities for drylands people/drylands farmers?</b>	Encourage applied and participatory based research, traditional and local knowledge on land management & conservation techniques, recognition of importance of local land users and decision makers	Our priority issues are for dryland people be it agriculturalists or pastoralists. However, the priorities for the governments of the countries we work in are often not for pastoralists	Rural areas stakeholders in general for fighting against desertification, climate change, drylands people for food security aspect	Food security Poverty reduction Natural resource management	
2c	<b>How do you get to know priorities of drylands people?</b>					
	by organization	Members with long-term experience field experience and field research. Knowledge exchange between scientific community and local users and decision makers. Cooperation with local and international NGOs working with local communities	The priorities of dryland people are identified by our member organizations in the countries we work in	Permanent assessment in the 9 countries to identify environmental and social risks and more particularly in food insecure areas. Otherwise, more generally assistance in implementation of national and regional policies concerning desertification and climate change	Through global food security and poverty mapping	
	by country or region					
	by government					
2d	<b>What criteria are used to decide on priorities?</b>					
	by organization	International scientific communication on relevant research issues. DesertNet is a science-policy interface, Regular communication and cooperation with UN agencies (UNCCD, CST) and international research programme	The priorities of drylands as defined in our strategy were decided upon at a seminar with our members and through problem tree exercises	Priorities are fixed by members of CILSS and more particularly via the meeting of the presidents and governments of the member states	Global Hunger Index and people below \$1/day poverty line	
	by country or region					
	by government					

3	<b>How are policies and intervention areas decided?</b>					
	by organization?	Provide decision makers and politicians science-based decisions for sustainable dryland development. DesertNet member of Dryland Science for Development Consortium (DSD)	Based on the results from our studies/ action research, we try to influence policies or their implementation	Transfer and Implementation of regional and international policies to national level	The organization is now developing strategy for research in drylands	In a participatory manner, all projects are executed through GTZ after close negotiations between the German government and the partner nations. Besides this GTZ advises and develops project ideas/ research needs to/for the ministry of economic cooperation and development
	by country or region?					
	by government?					
4	<b>Definition of success</b>	Human wellbeing in drylands is maintained and enhanced by providing sound science to land users, decision makers and politicians	Success is very subjective but it should be defined by the beneficiaries of a project and it should be seen in a wider perspective especially for an organization. Success means that the project managed to create significant change that is considered to be positive by the people targeted in the project. For the project to be successful it needs to be sustainable and if possible replicable to a certain extent	Success in agriculture is any option which improves the standard of living of people, reducing their vulnerability, the level of food insecurity and poverty	If people can have adequate food and nutrition for a healthy life and be able to afford the necessities of life, that is free from deprivation.	A project is successful if more than 90% of the aimed goals could be achieved at the project's end and sustained. Success is the achievement of the aimed goals
5	<b>What is success in drylands Africa?</b>	Maintenance of the goods and services of dryland ecosystems to maintain/enhance human wellbeing. ii. Promote a sustainable socio-economic development in drylands. iii. Strengthen Knowledge management and research collaboration between countries affected	Successes in drylands would be to create development that is replicable in other dryland areas. This development should take into account the specific needs and desires of the various people living in drylands and should contribute to reducing conflict between	Water and soil conservation techniques allowing farmers to adapt to climate variability and improving agricultural production	Same as above. Tigray region of Ethiopia	Regarding agricultural research for development the breeding of drought tolerant and resistant crops is in many projects a success story

		by desertification and between affected and non-affected countries.	the agriculturalists and the pastoralists. A project that we are engaged in in Mali looks at techniques to regenerate pastoral routes in order to reduce conflicts between pastoralists and agriculturalists and to increase the natural resources available for the pastoralists' livestock. This project also includes discussion between these two groups and the development of local conventions on the management of and access to natural resources			
6	<b>Elements to achieve success in Africa's dryland</b>	Applied and participatory based research for sustainable dryland development which includes scientists, land users, NGOs, decision and policy makers. Promoting ways for investments in drylands	The needs of the local people need to be taken into consideration and no blueprint solution can be applied to the drylands, even in a same country. The drylands also need to have a change in image so that they are seen as important areas in terms of biodiversity, development potential of a country, and tourism. The people living in dryland areas also need to be taken into consideration when development plans for the country	Assisting smallholder farmers financially and technically for better dissemination of best agricultural practices. Should be public and private aid	Water harvesting Aforestation Agroforestry (with economic trees)	

7	<b>What indicators to measure success in Africa's Drylands?</b>	Extent of land degradation, poverty, local awareness of degradation, human displacement, sustainable investments.	Indicators in terms of well being of inhabitants of drylands, extent of inclusion of needs and interests of people of drylands in national policies and quality and extent of the implementation of these policies, improvement in terms of food security, indicators of decreased vulnerability to climatic risks, indicators of change in amount of conflict, etc.	Biophysical: agricultural yields, biodiversity, groundwater level Socio-economic: level of poverty & migration	Yield increases of staple foods	Indicators that envelop environmental, social and economic aspects
8	<b>Are you aware of any success stories in Africa's drylands</b>	Numerous participatory base research projects. For detail contact: office@european – desertnet.eu	Yes. There has been extensive greening occurring in the Sahel areas especially in Niger where it is being documented. This greening is taking place without support or incentives by NGOs and by the own will and strength of farmers who are protecting trees on their fields and benefiting from this	Water and soil conservation techniques in Burkina Faso, Cap vert Agroforestry, assisted natural regeneration, Niger, Mali Desalinization technics in senegal, Guinée Bissau Les Conventions locales au Mali Participatory management of ranches and forests in Burkina Faso	Conservation agriculture in the Tigray region of Ethiopia where a combination of organic farming, land restoration, water harvesting and afforestation are practiced	No
9	<b>Are you aware of any successful partnerships on drylands issues</b>	DesertNet (building scientists from different countries [52 countries at the moment]), Drynet building partnerships between different international NGOs who work together with local communities/land users)	The greening initiative aims at such partnership and is in its infancy. Our network includes NGOs, governmental institutions (such as the focal points of the UNCCD) and research institutes. Collaboration on projects and advocacy activities as well as sharing information between these different member organizations is strongly encouraged in our network		Tigray region of Ethiopia – public-private partnership in ecological restoration	Yes, please refer to: <a href="http://www.gtz.de/en/themen/laendliche-entwicklung/1815.htm">http://www.gtz.de/en/themen/laendliche-entwicklung/1815.htm</a> And to: <a href="http://www.cgiar.org/mont-hlystory/august2009.html">http://www.cgiar.org/mont-hlystory/august2009.html</a>

10	<b>Top 3 Priorities to achieve success</b>	<p>1: Promotion of integrated, applied and participatory research.</p> <p>2: Development of longer term research programmes (not just short-term projects)</p> <p>3: Promote the development of a scientific panel on land / desertification which will be policy-relevant but not policy-prescriptive</p>	<p>_ Invest in the livestock sector to give a chance to pastoralists and make them less marginalized</p> <p>_ Develop a commercial / trading system for products coming from dryland areas that boost the local economy, give an important role to women while at the same time protecting the environment and making a sustainable use of it</p> <p>_ Develop carbon sequestration projects in collaboration with pastoralists where they are given incentives to protect rangeland areas</p>	<p>Promoting water and soil conservation techniques and agroforestry</p> <p>Promoting Ecotourism</p>	<p>Increase water availability</p> <p>Undertake afforestation/agroforestry</p> <p>Set up institutional arrangements for land use by crop farmers and pastoralists. Encourage collective action through community-based organizations</p>	<p>Investing in extension of lessons learned</p> <p>Education/Training of farmers and rural community</p> <p>Investing in infrastructure but adapted to changing climatic conditions (roads, irrigation/wells, schools/universities/hospitals)</p>
11	<b>Additional Comment</b>		<p>We would really appreciate receiving the results of this survey</p>			

## International NGOs

Question		USAID-RELPA	USAID-ELMT	COOPI	SOS-Sahel
		The Greater Horn of Africa of the 19 COMESA group of countries	Mandera Triangle (Border regions of Kenya, Ethiopia, Somalia)	Horn of Africa	The Sahel region – specifically Mali, Niger, Sudan, Ethiopia and Kenya
1	<b>Are drylands a priority for</b>				
	the organization	yes	yes	yes	yes
	the country or the region	yes			yes
	the government	yes			
2a	<b>What are priorities / how are they identified?</b>				
	for organization	Pastoral Areas Coordination, Analysis and Policy Support (PACAPS) an activity of the wider Regional Enhanced Livelihoods in Pastoral Areas (RELPA); a COMESA programme funded by USAID-East Africa.	Building resilient livelihoods, building peace and avoiding conflict and advocating for good governance; priorities were identified through baseline study and through discussion with pastoralists	Based on the environmental situation of the area (low rainfall and frequent droughts/bad years), major priorities are: 1. Food security-frequent need to provide external aid to feed an increasing population that is occupying areas whose productivity is going down 2. Water supply scarcity at household and production level 3. Challenges of diseases both human and livestock that is aggravated by poor nutrition and reduced basic food leading to reduced levels of disease resistance 4. Poor education levels and hence lack of alternatives in form of employments outside the local environments 5. Long periods of development neglect by regional governments coupled with the areas being marginal. 6. An ever increasing level of conflicts, some resources based, other political thereby complicating any efforts to help the areas 7. An ever increasing population an above average population growth in dryland areas	Pastoralism, drylands, the Sahel – identified through consultations with broad-based peer organizations

				Through frequent information sharing, and needs assessment the needs are fairly well documented. For Somali, there is frequent updating of priorities through FSAU documents and website, while in Kenya there is the Kenya Food Security Meeting every month that reviews most of the priorities. However, sometimes the information shared is not a true reflection of the actual situation on the ground and this leads to development of interventions that do not address the true cause of the problems	
	for country or region	Focuses on Greater Horn of Africa within COMESA Region			Mali, Niger, Sudan, Ethiopia, Kenya
	for government	COMESA, an inter-governmental trading block for Eastern and southern Africa. 19 countries			
<b>2b</b>	<b>Priorities for drylands people/drylands farmers?</b>	Pastoralists and Agro-pastoralists	They are priorities for pastoralists	All of them- there is actually no major difference in these categories as they keep on moving from one group to the other as situation demands	Yes, all of them
<b>2c</b>	<b>How do you get to know priorities drylands people?</b>				
	by organization	frequent droughts in the GHA leading to loss of livelihoods; where main response instrument has been food aid. PACAPS seeks to change policies giving priority to those that protect livelihoods instead of food aid. The funding comes from the US Congressional Famine Fund with the objective of reducing need for food aid in the region	By talking directly to pastoralists	Most of these issues come out mainly after a disaster-e.g. drought or floods whereby the international community is able to highlight the issues through the media	We have been working in the Sahel for 25 years

	by country or region	COMESA is implementing the NEPAD- Comprehensive Africa Agriculture Development Programme (CAADP). CAADP Pillar 3 specifically targets Food Security and Nutrition. The activity is therefore one of the Early Action programmes under CAADP pillar 3.			Mali, Niger, Sudan, Ethiopia, Kenya
	by government	COMESA is working with partners - NGOs, Universities, other donor programmes who have expertise and are actively engaged in these semi-/ arid lands.			
<b>2d</b>	<b>What criteria are used to decide on priorities?</b>				
	by organization	key areas/themes to protecting and enhancing pastoral livelihoods: Trans-boundary livestock disease control; improving mechanisms for Early Warning and Early Response to droughts and other disasters; enhancing options for trade in livestock and livestock products in the region and internationally; and promoting change in policies that impede resilience and enhancement of pastoral livelihoods. Conflict sensitivity is a cross-cutting pre-requisite to achieving these objectives	We don't develop a criteria but get pastoralists to set their priorities using semi-structured questionnaires and focused group discussions	Experiences in certain sectors of development and also availability of funding for certain sectors. In some situations, some priorities are left out if no donor is willing/available to fund them, as most donors and governments are sector specific in their funding.	By researching gaps in our sector – we looked at what was left uncovered and compared that with our areas of expertise
	by country or region	Need to enhance food security and promote economic activities for the pastoralists in the region			
	by government	Political pressure is building up so governments in the region are paying greater attention to the drylands.			
<b>3</b>	<b>How are policies and intervention areas decided?</b>				

	by organization?	PACAPS is collecting data and using evidence as argument for all these objectives	We bring together pastoralists and government people and facilitate discussion for the development of pastoral friendly policies and interventions	Based on needs assessment and donor criteria	We work with government departments, most specifically with the Ministry for Northern Kenya and Other Arid Lands, and the Ministry of Education in Kenya
	by country or region?	Policy narratives, based on presented evidence, are presented as agenda to COMESA Council of Ministers of Agriculture, who adopt and make recommendations to member governments to domesticate these policies			Kenya
	by government?	Member countries make specific policies within the framework of the COMESA policy guide			
4	<b>Definition of success</b>	When an action or intervention achieves sustainable desired change on the primary target group, where the problem was first described	In our context success is building resilient livelihoods and having peace in pastoral/ dry land areas	Achieving your project/programme objectives provided the objectives are well defined	When dryland dwellers can successfully communicate their needs to those with the power to decide on policies and resource allocation
5	<b>What is success in drylands Africa?</b>	<p>Community driven bio-conservation efforts</p> <p>b). Community based Environmental management, through simple measures like paint-marking trees that need to be preserved; Eco-tourism</p> <p>c). Communities doing Rangeland mapping via GIS tools</p> <p>d). Increasing understanding of issues of desertification, climate change and mitigation measures</p> <p>e). Adoption of Policies that recognize and support traditional decision making systems among pastoralists; including recognizing mobility (better successes in Western Africa)</p>	It is difficult to pin point a success but there are beginnings : The REGLAP advocacy work, The Enhanced Livelihood in the Mandera Triangle, The DFID funded Democracy , Governance and Peace for Pastoralists Project are examples	<p>Any project that is able to get people to feed themselves is success. E.g.</p> <ol style="list-style-type: none"> <li>1. Irrigation projects along major rivers in Kenya-Tana, Athi and Daua</li> <li>2. Livestock improvement projects that have controlled major diseases</li> <li>3. Primary Education</li> <li>4. Human diseases eradication</li> </ol>	Setting up a new Ministry for Northern Kenya and Other Arid Lands (Kenya) – established specifically to meet the needs of dryland dwellers

6	<b>Elements to achieve success in Africa's dryland</b>	<p>Allow, involve, recognize, support traditional users/owners of the drylands to plan and make decisions on best use of the drylands. External pressure to change use or alienate lands has not worked.b). Pastoralism is often the best use for these drylands. It should be supported as a livelihood. Mobility is a key survival strategy and need to be facilitated, sometimes across national borders. Regional, rather than national, concepts and policies therefore work best for both resources use, markets access and disease control.c). Diversified economic activities to minimize risksd). Support conflict mitigation. Most of the conflicts are resource-use based and recognition of user rights by and for each community is critical in minimizing conflicts. Reciprocity rather than expansionist or force-access to resources.e). Supportive policies to enhance ownership, management, resource conservation and access to benefitsf). Access to appropriate universal education for the population in the drylands</p>	<p>In my opinion having the right policy and the enabling environment as well as good governance; judicious allocation and use are the key elements</p>	<p>Planning for development that meets peoples need based on their local setting- avoid technologies that are foreign to local people</p>	<p>Lining up evidenced opinion from dryland dwellers with policy making and resource allocation</p>
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7	<b>What indicators to measure success in Africa's Drylands?</b>	<p>Improving range health and productivity</p> <p>b). Enhanced incomes and access to basic services of the majority of users</p> <p>c). Diversified sources of incomes and skills in the population</p> <p>d). Reducing resource use conflicts</p> <p>e). Improved political awareness and practice for all people and gender</p>	<p>Infrastructure development</p> <p>Pastoral voice and representation in policy making</p> <p>Resource/ budgetary allocation</p>	<p>To wide to be indicative- most should be sector based</p>	<p>Policies that are made to support dryland dwellers, which then lever the resources necessary from those with the power to provide them</p>
8	<b>Are you aware of any success stories in Africa's drylands?</b>	<p>Transhumant practices governed by inter-governmental laws in Western Africa.</p> <p>b). Eco-tourism ventures among group ranches in northern Kenya</p> <p>c). Operative Environmental Management by-laws and practice in lowland Marsabit district, Kenya</p> <p>d). Traditional governance systems for resource use and conflict resolution among the Borana and Gabra of northern Kenya and Southern Ethiopia</p>		<p>Yes</p> <p>If yes, please give examples.</p> <ul style="list-style-type: none"> <li>o The Ec funded, Community Development Trust fund in Kenya- which covers all areas of development (dryland and high potential)</li> <li>o The ECHO funded drought preparedness programme in the horn of Africa</li> </ul>	<p>[sorry, limited time so we have not answered this question</p>
9	<b>Are you aware of any successful partnerships on drylands issues?</b>	<p>see question 5</p>			<p>[sorry, limited time so we have not answered this question</p>
10	<b>Top 3 Priorities to achieve success</b>	<p>1 Enhance infrastructure in these drylands that have typically been marginalized</p> <p>2 Climate change will probably have the most significant impact in the short term and long term. Invest in mitigation.</p> <p>3 For policies and other software issues, go regional</p>	<p>1 Infrastructure development</p> <p>2 Education/Human Resource Development</p> <p>3 Policy making process-Pastoral Voice and Representation, conflict resolution</p>	<p>1 Education especially formal education which would consequently help in addressing other priorities in the long run.</p> <p>2 Water development-human and production – sustainable water supplies</p> <p>3 Control of population growth and the human health issues</p>	<p>1 Understand the priorities of the dryland population</p> <p>2 Build relevant/realistic policies that are part of national development plans</p> <p>3 Allocate resources to make these policies a reality, e.g. roads, education, marketing</p>

11	<b>Additional Comment</b>	The crisis in the dry land areas of Africa is a lack of vision and policies as a result of marginalization. I believe one should think about sorting out the governance issues before even talking about development. I know this is difficult for a research organization but the minimum it can do is work on governance and development issues simultaneously. Otherwise it will be pouring precious and scare resources into a bottom less pit		
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## AIDA partners

Question		FARA	AGRHYMET
1	<b>Are drylands a priority for</b>		
	the organization	Yes	Yes
	the country or the region	Yes	
	the government		
2a	<b>What are priorities / how are they identified?</b>		
	for organization	FARA accepts the priorities of its stakeholders and all four African Sub Regional Organisations (SROs) have drylands as priorities. These were defined by determining where and how agricultural research could have the most impact in improving livelihoods. They include water and pasture conservation and optimal usage, market policies, organisation and infrastructure, minimizing rent seeking and promoting community initiatives.	Drought, climate change , identified at regional level
	for country or region	Drylands are a major part of most African country landscapes at national and certainly regional scales	
	for government		
2b	<b>Priorities for drylands people/drylands farmers?</b>	If the prioritisation has been done well it should reflect the priorities of the farmers and pastoralists	participative studies, concern all stakeholders of rural areas
2c	<b>How do you get to know priorities of drylands people?</b>		
	by organization	Through SROs' analyses of options for research and through government and Regional Economic Community plans, papers and conferences	Via information, training , extension from national services composing the center (Agrhyment)
	by country or region	same	
	by government		
2d	<b>What criteria are used to decide on priorities?</b>		
	by organization	The SROs applied criteria that reflect research capacity to sustainably and significantly improve livelihoods	vegetation indicators, rainfall, harvests
	by country or region	same	
	by government		

<b>3</b>	<b>How are polities and intervention areas decided?</b>		
	by organization?	FARA supports networking amongst its stakeholders, including research, farmers, civil society, agri-business organizations to create critical mass, reduce duplication and avoid critical gaps	Via regional programmes, advisory meeting of ministries of CILSS and meetings of head of countries of member countries of CILSS
	by country or region?	same	
	by government?		
<b>4</b>	<b>Definition of success</b>	FARA will be deemed successful when it's stakeholders have the resources, the information and technologies, efficient markets and enabling policies, the human and institutional capacities and the effective partnerships and strategic alliances required for effective dryland innovation	A good result after an action
<b>5</b>	<b>What is success in drylands Africa?</b>	Success will be achieved when the communities in the drylands can look forward to a better future with a mix of pastoralism, dryland farming and incomes from non-farm sources that will enable them to manage the natural resources sustainably and yet provide adequately for their families	land regeneration, water conservation
<b>6</b>	<b>Elements to achieve success in Africa's dryland</b>	Success in optimising sustainable use of Africa's drylands will come from a combination of genuine partnerships between researchers, pastoralists, commercial firms with the support of enabling policies that focus on both sustainable community and landscape scale land use and diversification of options for non agricultural employment	Rational management of natural resources
	<b>Examples</b>	For example Kenya has plans for a wind farm with 300 turbines in arid Turkana land but will that benefit the local people or will all the employees be brought in from other districts and will all the electricity be wired out to the cities. The same questions can be asked of the new dam on the Omo river in Ethiopia	

7	<b>What indicators to measure success in Africa's Drylands?</b>	The indicators are as complex or as simple as the observer wishes and there are many standard indicators of human welfare and environmental health. Personally, gross pastoral happiness would be the best indicator because the pastoralists are well aware of how good or bad the present is and of how the future is shaping up to be, but they are not able to express it in ways that external pundits such as us like to express human and environmental health and welfare.	Vegetation, harvests, rainfall, physical stability of soils
8	<b>Are you aware of any success stories in Africa's drylands : yes or no and exemples</b>	Yes_ I would list the technologies identified at the start of AIDA but I doubt that list is complete. However, I do not have sufficient firsthand information on other success that I suspect are out there in water harvesting, eco-tourism, gum Arabic, spineless cactus, aloe vera and other aloes, acacia honey, jojoba, shea butter, neem, tamarind, wind farms, solar electricity etc.	Yes_ land regeneration in Niger (Keita project), Zai system in Niger and Burkina-Faso, other water conservation technics
9	<b>Are you aware of any successful partnerships on drylands issues ?</b>	YES. Since I am not a field worker the only example I have firsthand knowledge of is community eco-tourism ventures in East Africa which are collaborations between local communities and commercial eco-tourist businesses	Niger River project ABN, French Cooperation, USAID
10	<b>Top 3 Priorities to achieve success</b>	1/ Bring pastoral organisations to the table because even in comparison to farmers' organizations they are poorly represented in forums in which their interests are discussed. 2/ Provide training to all concerned with dryland areas in principles for converting knowledge to action and in helping communities achieve what they want to achieve. 3/ Provide training to parliamentary committees and other policy makers to breakdown the stereotype images of pastoralists	Inclusion of farmer in the activities of land regeneration Better use of natural resources une meilleure Trainings on rational natural resources management
11	<b>Additional Comment</b>		

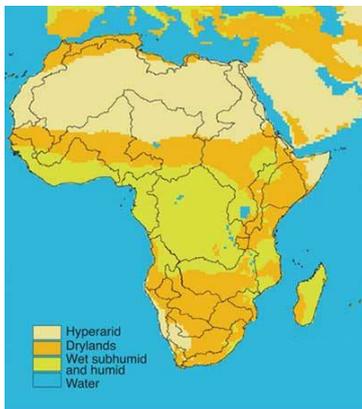


### AIDA Policy Brief - Why invest in Africa's drylands?

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#### Context

In Africa, 43% of the land area is classified as drylands and annual water availability per capita is about 5,000m<sup>3</sup>. This includes several countries in: the Sahel, the Greater Horn and some parts of Southern Africa. 268 million people, more than 40 % of the continent's population, live in these areas and many of them depend on farming and pastoralism for livelihoods and food.



In Kenya, for example, about 36% of the national population and 50% of the livestock are found in drylands which occupy over 80% of the country. Over the years, dryland people have learned to cope with the very harsh and variable environmental conditions. However, the continuous threat from further soil degradation and increasing water

scarcity, are overstressing their traditional resilience and adaptation strategies. Increasing human and livestock populations, climate change, incoherence in national and international policies and lack of long-term funding for research programmes that build on local knowledge are aggravating the situation. The increasing conflicts, poverty and food insecurity and inability to

sustain ecosystem services are priorities for governments, donors, non-governmental organizations, researchers and the dryland people themselves.

The perception that Africa's drylands are non-productive remains and their importance and contribution to the food and nutrition security and livelihoods of drylands people is not being given sufficient attention. The challenging environmental conditions suggest that little can be done to sustainably raise productivity and improve livelihoods. Yet, on the contrary, Africa's drylands have considerable potential for development and can provide multiple goods and services: crop, forage and livestock production, freshwater catchment, biodiversity conservation, tourism, energy, and carbon sequestration. That is provided that the right balance can be found in dryland policies and programmes that are aimed at; increasing food security, reducing poverty, improving livelihoods, achieving natural resource management and ecosystem sustainability (biodiversity, soil and water) and enhancing local adaptation strategies to cope with climate change.

The Agricultural Innovation in Drylands of Africa project (AIDA)<sup>1</sup> analyzed rural development initiatives, identified key drivers for success and proposed policy options for investing in the sustainable development of Africa's drylands. This policy brief is an output of the project and is aimed at sensitizing all stakeholders who have an interest in investing in the future of Africa's dryland.

#### There are successes in Africa's drylands

Since 1995, in Mali, building on a traditional practice of ridge tillage, a new technique of field arrangement along contour lines was tested. Contour lines are permanently marked in the field by a large ridge covered by natural grass. Farmers then work parallel to the ridge. The resulting inter-ridge becomes a basin that holds rainwater. This water conservation technique, increases soil fertility and quality and respects traditional land rights. It has been adopted by significant numbers of farmers. (Traoré, K. et al., 2007)



Photo: T.F. Shaxson, FAO Bulletin No. 79

Following a study tour to Yatenga region in Burkina-Faso, Nigerien farmers introduced the traditional zaï technique for rehabilitating degraded soils in the Illela District in Niger. They developed it into an integrated water harvesting and soil fertility management technique. This improved practice of conservation agriculture, spread farmer-to-farmer, and led to the rehabilitation of 9,000 ha barren and encrusted land. (Hassane, A et al., 2000)



Photo: R. Lahmar, CIRAD

## What contributes to success?

The following list is not exhaustive but it indicates the factors that can lead to success in Africa's drylands. These are:

- Participation of dryland communities in policy and programme identification and development to ensure local ownership of rural development initiatives;
- Partnerships between and among all the different actors/stakeholders in programme implementation;
- Availability of innovations and co-investment by government, donors and the communities, to up-scale them;
- Enabling policies that facilitate secure access to land and water resources, credit, inputs and markets;
- Demand-driven research, and science and technology interventions using multi-stakeholder participatory processes that build on local knowledge;
- Education, training and communication that integrate farmer-to-farmer transfer.



Photo: R. Lahmar, CIRAD

## What investments to pursue for the development of Africa's drylands?

Policy makers and other stakeholders including researchers believe that the following are necessary investments for the sustainable development of Africa's drylands:

- Good governance and holistic policies that are consistent with the realities of Africa's drylands and their people;
- Equitable allocation of and access to resources;
- Strengthening capacity in natural resources management (soil, water and biodiversity) and ecosystems services;
- Long term funding for research on dryland issues that enable local communities to participate in the research design and uptake and out-scaling of results;
- Development of trading and marketing systems which reduce transaction costs and maintain equitable terms of trade for dryland people especially at times of climatic stress;
- Appropriate institutional structures and arrangements for encouraging and facilitating sustainable land use practices e.g. conservation agriculture and water harvesting techniques, improving crop and livestock production systems, enhancing food security and facilitating market access and enhanced intra-regional trade;
- Infrastructural development – roads, telecommunications, schools, health services.

## Conclusion

Much can be achieved in Africa's drylands if policies and research programmes reflect the realities of dryland ecosystems. It is essential to recognize and involve traditional users and owners of the drylands in policy development, programme planning, research design and implementation and in monitoring and evaluating co-innovation processes. In drylands, mobility is not just a key survival strategy; it is also an appropriate approach to sustainable land use which needs to be facilitated, sometimes across national borders. This requires complementary regional and national policies that will enhance environmental sustainability, reduce resource-based conflicts and facilitate trade. Research in support of drylands agriculture should reflect the diversity of local adaptation strategies and dynamics and the holistic ethnic science that produced them. Enabling education, access to information and learning are key strategies for enhancing knowledge for sustainable development. Two-way interactive communication is also critical for up-scaling best practices.

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## PERCEPTION PAYSANNE DES EFFETS DU ZAÏ DANS LA SOCIÉTÉ MOSSI DU NORD DU BURKINA FASO

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Le zaï manuel est une technique paysanne de production connue dans la zone sahélienne. Malgré son efficacité avérée, son expansion reste limitée par la quantité de travail requise. La mécanisation du zaï est une innovation récente, elle réduit significativement le temps et la pénibilité du travail, améliore la production, réhabilite les « Zipelle » qui sont les sols totalement dégradés qui forme une croûte et préserve la durabilité des ressources naturelles.

Une enquête conduite en Afrique de l'Ouest auprès de 60 producteurs du nord du Burkina Faso (figure 1) a permis d'apprécier leurs perceptions et pratiques du zaï manuel et mécanisé. L'enquête a été conduite en 2007 dans 12 villages répartis sur les 5 départements de la province semi-aride du Zondoma, où la pluviométrie moyenne varie de 500 à 700 mm et les sols sont de type ferrugineux tropicaux lessivés (Ferric Lixisol selon Fao-Unesco), peu profonds (50 à 80 cm).

Tous les producteurs enquêtés utilisent le zaï manuel dans leurs exploitations mais seulement une partie d'entre eux a adopté le zaï mécanisé. L'objectif de l'étude était d'apprécier les avantages et les contraintes liés à l'utilisation du zaï mécanisé ainsi que les freins qui limitent la diffusion auprès de tous les paysans.

### Résultats

L'étude montre que 97 % des producteurs savent comment pratiquer le zaï mécanisé alors que seulement 57% d'entre eux ont suivi directement une formation à cette technologie. On en déduit que l'information relative à l'innovation a été relayée par d'autres canaux tels que les champs écoles, les visites commentées ou les médias. On note aussi que malgré cette large dissémination de l'information seulement 30% des producteurs pratiquent le zaï mécanisé en plus du zaï manuel et que les superficies exploitées par le zaï mécanisé restent faibles, elles ne dépassent guère 1,5 ha par exploitation (figure 2).

La majorité des adoptants considèrent que le zaï mécanisé présente beaucoup d'avantages mais que des contraintes à sa mise en œuvre existent. Les plus importantes sont la disponibilité du matériel et l'investissement de départ (figure 3). Pour l'ensemble des producteurs, la disponibilité de la force de traction et de la fumure organique apparaissent comme des freins majeurs dans l'adoption du zaï mécanisé (figure 4).

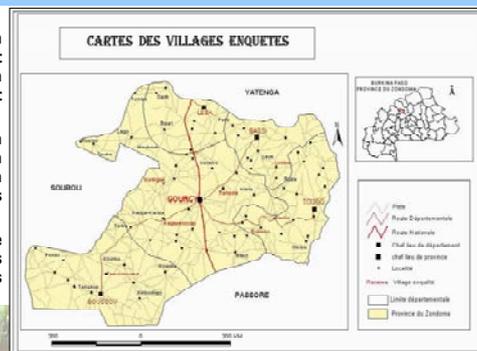


Figure 1: Carte de la province du Zondoma

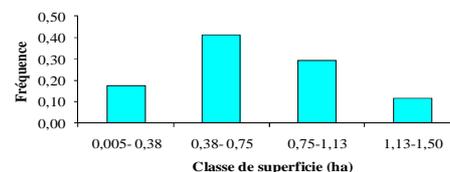


Figure 2: Classe des superficies réalisées en zaï mécanisé

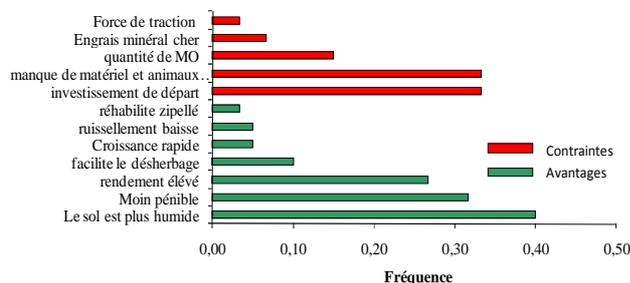


Figure 3: Avantages et contraintes du zaï mécanisé selon les producteurs adoptants

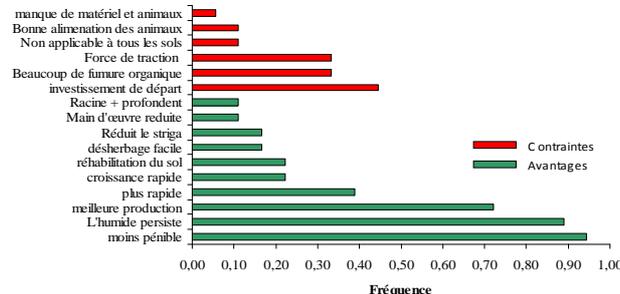


Figure 4: Avantages et contraintes du zaï mécanisé dans l'ensemble des producteurs

### Discussion

Les producteurs qui pratiquent le zaï mécanisé, considèrent que la force de traction des animaux n'est pas une limitation majeure car ils disposent d'animaux de traits. Mais ceux qui ne disposent pas d'animaux ont des difficultés de mise en œuvre du fait des charges d'alimentation animale et des problèmes liés au harnachement qui peut réduire la capacité de traction de 30 %. La rapidité et l'aisance du zaï mécanisé permettent aux producteurs d'avoir des gains de production et des gains de temps de travail qu'il peuvent destiner à d'autres activités. Le temps libéré permet notamment aux enfants une meilleure scolarité et aux femmes de pratiquer des activités commerciales ou collecter du fumier pour la confection du compost (Figure 5). Le gain de temps est utilisé par les hommes à la confection et l'entretien de fosses fumières et de l'habitat. Une partie importante de ce temps est consacrée à l'entretien des animaux et à la création de nouvelles parcelles.

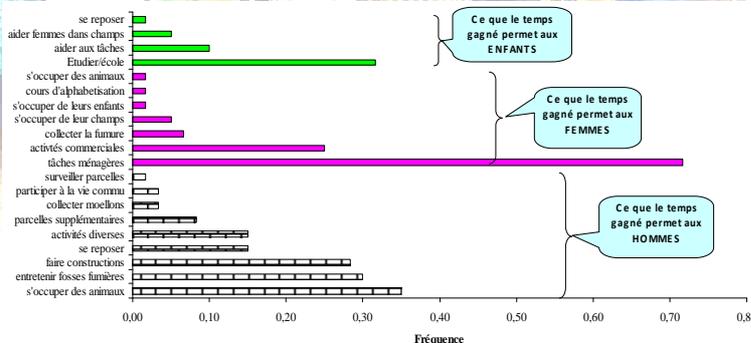


Figure 5: Usage du gain du temps libéré par la pratique du zaï mécanisé

### Conclusion

Les résultats montrent que des contraintes demeurent à l'adoption et l'amélioration du zaï mécanisé malgré son impact social immédiat. La réduction du temps et de la pénibilité du travail et la rapidité de récupération des terres dégradées sont les avantages les plus importants ainsi que les bénéfices additionnels générés par l'utilisation du temps épargné.

Les médias ont contribué à populariser le zaï, les radios rurales et la presse écrite interviennent également lors des visites commentées. Leur rôle est important dans l'accompagnement et le renforcement du processus d'innovation notamment pour la sensibilisation des acteurs locaux et nationaux afin d'améliorer les conditions de succès: disponibilité du matériel, capacité d'investissement de départ suffisante et alimentation animale permettant une meilleure capacité de traction.



## LIST OF SELECTED ABSTRACTS FROM AIDA STUDENTS

### SESSION: MEDIA AND ARID AND SEMI-ARID ZONES

*(Note: In this session the presentation titles reflect the dryland scientists' area of research. The roundtable discussion in this session will focus on how to strengthen the role of media in drylands research.)*

#### **STUDY AND ANALYSIS OF THE IMPACTS OF AGRICULTURAL HOLDINGS AND LIVESTOCK FARMS LOCATED AROUND PROTECTED AREAS: CASE OF THE 'W' PARK OF NIGER REPUBLIC**

*Ms. Teresa Fernandes Pereira da Veiga Tavares  
Niger*

**Abstract:** The 'W' Park experiences significant anthropogenic pressure due to population growth, agricultural, pastoral and hunting activities. Its effective and sustainable management strategy requires the consideration of medium and long term problems posed by human activities particularly through land use. Furthermore, to understand/know the impacts a study on the dynamics of interactions between the biophysical and socio-economic systems is needed. Their understanding will make it possible to obtain indicators on resource degradation and to develop decision support tools for sustainable management of these resources. In this context, agropastoral uses and practices are considered to be disrupting the natural environment.

The aims of the initiative are: 1) to contribute to the biophysical characterization of the area in order to help with concerted agropastoral resource management and the prevention of conflicts around the 'W' Park; 2) to study and analyze the impact of human activities on the environment through land use around the Park; and 3) to determine a useful area and a mode of sustainable natural resource management for the agropastoral activities of the communities living around protected areas.

The project includes literature review, exploitation and analyses of maps, utilization of remote sensing and GIS, survey and interview of the authorities of the 'W' Park of Niger, livestock service and villages (local authorities, farmers, livestock breeders, representatives of farmers' and livestock breeders's associations and NGOs). Zoning of the Park periphery based on the various anthropogenic pressures is known and the socio-economic activities and resource utilization in riverine villages around the Park are known.

The pressure on the resource and environmental impact resulting from agropastoral practices in and around the Park are known, and the strategy adopted for managing the lands around the Park and for improving. Proposals for a better management will be submitted to the authorities and will be used for other Parks in the country.

## **TAKING STOCK OF THE REHABILITATION OF DEGRADED SOILS IN THE SAHELIAN DRY REGIONS USING THE ZAÏ TECHNOLOGY (BURKINA-FASO, MALI, NIGER)**

*Ms. Delphine Droux*  
*France*

**Abstract:** In the dry regions of Sahel, soil degradation reduces the extent of arable land and drops the agricultural productions leading farmers to poverty and migration. Zaï is an indigenous technology, traditionally manual, that allows farmers to produce on degraded lands and to restore their fertility. Despite the efficiency of this technology in Sahel, its adoption remains challenged by the quantity of labor required (# 500hours/person/hectare) in the harsh conditions of the dry season. The mechanization of the zaï (mechanized zaï) reduces drastically the labor requirement and its drudgery, and improves the agricultural productions. Perspectives opened by mechanized zaï justify the scientific interest granted to it.

This work intends to take stock of the existing results and experiences on the zaï technology in its both versions: manual and mechanized, in order to build up a scientific knowledge prior to its large dissemination. It is based on a critical review of the available literature and a survey of 60 farmers located in 12 villages scattered on 5 departments of the Zondoma province, in the northern part of Burkina Faso. In this semi-arid zone, annual average rainfall ranges between 500 and 700 mm, soils are Ferric Lixisols with depth ranging between 50 à 80 cm and, the main crops grown are cereals (sorghum and millet). All surveyed farmers practice manual zaï but only few of them adopted mechanized zaï.

Currently, mechanized zaï is practiced only in the northern Burkina Faso, mainly in the frame of IFAD's development schemes. It has been addressed in a limited number of researches. Manual zaï is a common farmers' practice in Mali, Niger and Burkina Faso. It has been largely investigated in Burkina Faso, access to the results of the investigations carried out in Mali and Niger is however difficult. When practiced in the same conditions, the performances of mechanized zaï are said to be higher than that of the manual zaï; the higher soil humectation allowed by the mechanized zaï would be the reason. The field survey showed a large diversity in the farmers' practice of manual zaï. The available research results are generally enough scattered, they mainly focus on yield gains and can be challenged in some specific circumstances. The functioning of zaï and its impacts on soil water, organic matter, biology and nutrients and, induced changes in soil properties (pH, exchange complex, and texture) have been little investigated. On-field evidences confirm that there are situations where zaï undoubtedly aggrades lands initially degraded and non-productive (Zippelés). It remains nevertheless necessary to understand: i)- in which soil, slope and crop situations zaï is efficient ? ii)- When one can consider the major soil functions restored and what are the indicators? And, iii)- Which agricultural practices or cropping systems can be advised as follow-up to zaï? Responses to these questions will help considering the integration of the zaï in innovative cropping systems that may favor ecological intensification. Zaï in its manual and mechanized forms deserves a substantial research investment.

## **AN ECONOMIC ANALYSIS OF THE EFFECT OF VARIETY TRAITS ON THE ADOPTION OF IMPROVED PIGEON PEA VARIETIES IN KENYA'S DRYLANDS: A CASE STUDY OF TAITA DISTRICT**

*Ms. Zipora Otieno*  
*Kenya*

**Abstract:** In principle, farmers view an improved seed as a derived input embodying production and consumption attributes and decide on its adoption and the intensity of adoption. This paper proposes a holistic approach for plant breeding policy in developing countries. Drawing on the theory of duality which explicitly incorporates variety traits in to the household's optimization process, this study sought to investigate the drivers of AIDA project success story in *Taita* district. Specifically, the paper summarizes the results of research into factors contributing to the rapid adoption of improved pigeon pea varieties in Kenya's drylands with a focus on variety traits. Empirical analysis was based on a double hurdle model using data collected from 200 households in Taita district in 2009. A multitude of production and consumption traits valued by farmers as well as an array of household socio-economic characteristics were considered. Both the Probit and Multivariate Probit results indicated that five variety traits significantly influenced the rapid adoption of improved pigeon pea varieties: drought tolerance, pest tolerance, yield, ease of cooking, taste and the variety's ability to fetch a price premium. Early maturity was not a significant explanatory variable of the farmers' adoption decisions; contrary to the short duration varieties responsible for the rapid technology uptake in Africa's largest producer, Malawi. The implications of this are two-fold: First, varietal development and promotion must include consumption and market characteristics in addition to production traits when determining which varieties to promote. Secondly, non-yield production characteristics such as taste and ease of cooking are significant factors in farmers' assessments of the value of a new variety.

## **AN ANALYSIS OF FARMER GROUPS IN CONSERVATION AGRICULTURE (CA) IN DRYLANDS AREAS OF MALAWI: A CASE OF CHINGULUWE EPA IN SALIMA AND NKOMBA MODEL VILLAGE IN BAZALE EPA IN BALAKA DISTRICT**

*Mr. Mavuto Mdulamizu*  
*Malawi*

**Abstract:** The study on farmer groups in management of land and water in the drylands of Malawi was undertaken to understand the factors of farmer groups which are crucial to the successful implementation of conservation agriculture. Data was collected and analyzed using both qualitative and quantitative methods among farmers who were implementing conservation agriculture. Results revealed that social factors such as group leadership, social networks, structures and systems, competencies and skills, purpose and the values, beliefs and identity members attach to the group contribute to the groups' effective performance in implementing conservation agriculture. Issues of resources and environment in which the groups

operated were not significant for the groups' effective performance. Further results showed that farmer perceptions on the various conservation technologies were dependent on the performance of the technologies considering the bio-physical and socio-economic environments. It is recommended that social factors of groups be put in place if farmer groups are to be effective and successful in implementing conservation agriculture technologies. It is further recommended that bottom-up approaches must be pursued when recommending technologies.

## **AFRICA'S DRYLANDS : « AN OUNCE OF PREVENTION IS WORTH A POUND OF CURE »**

*Judith Ann Francis*

*CTA, Netherlands, AIDA partner*

*Danièle Clavel*

*CIRAD, AIDA Project Coordinator*

*Yodit Kebede, CTA, Netherlands*

**Abstract:** Africa is extremely dry, 43 % of the continent's landmass is classified as drylands and is under continuous threat from erosion and nutrient mining. Climate change may still aggravate this situation. Several major regions are impacted and more than 40 % of the continent's populations, 268 million people live in dryland areas. Dryland people are resilient having developed adaptation strategies to cope with the very variable environmental and climatic conditions. Yet, drylands are often seen as non-productive lands and their importance and contributions to the livelihoods of millions of people are not given sufficient attention. The perception exists that little can be done to sustainably raise productivity. However, Africa's drylands have high potential for development and can provide multiple goods and services. Within the EU-INCO Agricultural Innovation in Dryland Africa (AIDA) project, 22 case studies were evaluated and surveys were conducted among policymakers and researchers to identify key drivers for success and policy options that can promote investments in Africa's drylands. Results show that there is need for harmonization of policies and interventions in drylands which should reflect realities that dryland people face; ensure compatibility with land tenure issues; reduce resource-based conflicts and pave the way for more trade exchanges. Traditional users and owners of the drylands must be involved in policy development, programme planning and research design. Research in support of drylands agriculture should be participatory and reflect the diversity of indigenous adaptation strategies. Communication is key to success and for dissemination of existing practices for the development of local innovation



## EFFICIENCY OF CONTOUR BUNDS IN CONTROLLING SOIL AND NUTRIENT LOSSES FROM MAJOR AGRICULTURAL LAND-USE TYPES OF THE LAKE VICTORIA CATCHMENT

Majaliwa.J.G.M, <sup>2</sup>Magunda M.K., <sup>1</sup>Tenywa M.M., O. <sup>2</sup>Semalulu, <sup>3</sup>Rusoke C.

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**Introduction.** Soil erosion is widespread in Uganda. The major driving factors include poor land management and the conversion of forest land into agriculture and settlements threatening the health and stability of many aquatic ecosystems (Chittleborough, 1983; Johnes and Burt, 1991). Several streams draining dominantly agricultural micro-catchments in the Lake Victoria Basin have shown signs of water quality deterioration. The objective of this study was to determine the efficiency of contour bunds in controlling soil and nutrient losses from major agricultural land-use types of the Lake Victoria Basin.

### Materials and Methods

The study was conducted in Rakai-District, situated between 0° 35' - 1° 00' S and 31° 15' - 31° 48' E. The climate is bimodal with an annual precipitation ranging between 914 and 1118 mm. The average temperature is 23° C. The major soils in the area are ferralsols, gleysols and leptosols. The efficiency of contour bunds and mulch in controlling erosion and nutrient losses was assessed using runoff approach for 5 years. Thirteen (13) instrumented runoff plots measuring 15 X 10 m each were installed on 4 major agricultural land-use types were.

- Rangelands: generally degraded, and on slopes between 30 and 49%
- Annual crops: beans intercropped with cassava on slope between 30 and 40%,
- Coffee: *robusta* on slope of 15% to 22%
- Banana (cooking type); *Bwazimume*; on slope of 15% to 22%

Collected eroded sediments were air-dried and analysed for organic matter, available phosphorus, potassium, calcium, sodium, and magnesium.



Runoff plot on degraded rangelands

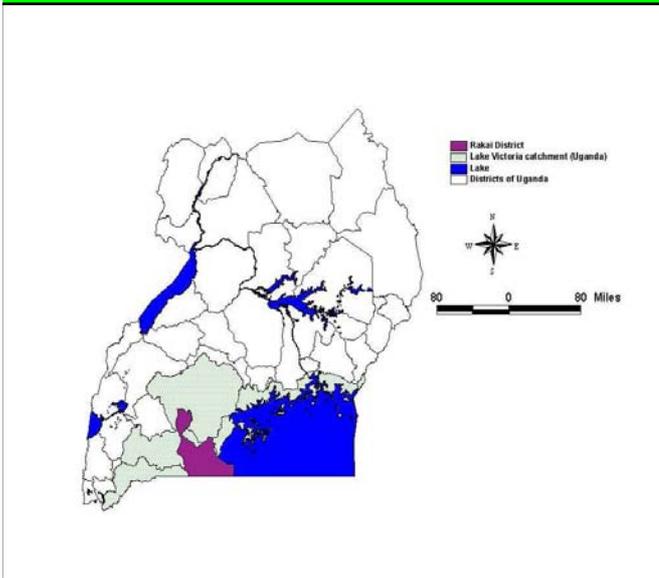


Figure 1: Map showing study area

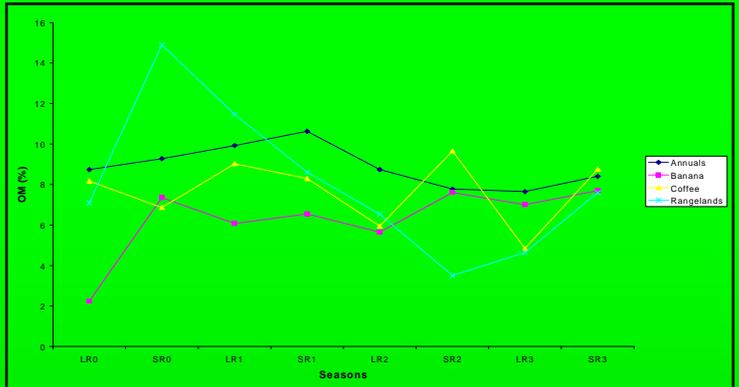


Figure 2: Effect of contour bunds on soil loss from major agricultural land-uses<sup>1</sup>

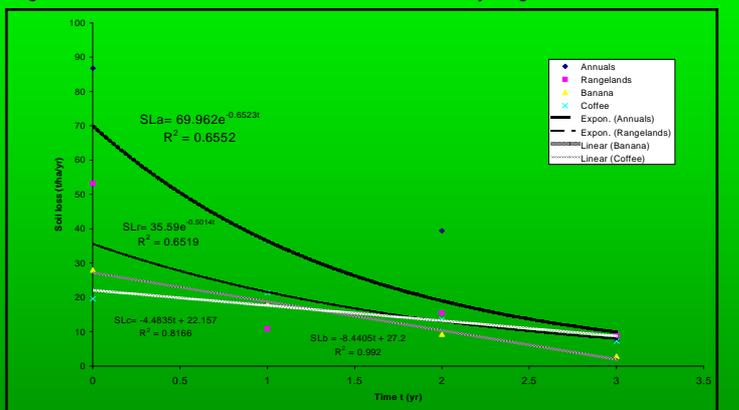


Figure 3: Soil loss over time

### Results and discussion

Soil loss decreased considerably three years after establishment of contour bunds and the trend of its variation was land-use dependent,

- ❖ linearly on banana and coffee
- ❖ Exponentially on annuals and rangelands

Runoff did not change significantly after the same period of time, but varied with land-use (p<0.05).

The concentration of nutrients in eroded sediments varied significantly across the years after the introduction of contour bunds (p<0.05). However, the amount of nutrients lost over the years followed the sediment trend. Results from this study seem to contradict observations that showed that contour bunds were only effective on lower slope gradients.

### Conclusion and recommendation

Contour bunds were effective in controlling soil and nutrient losses from the major agricultural land-uses of the Lake Victoria Basin. The response to the establishment of contour bunds is land-use dependent. There is a need of incorporating this technology in the set of control measures to be implemented in the basin. An integration of contour bunds with tree planting in the afforestation programmes will accelerate the rehabilitation of degraded hillsides.

### Acknowledgements:

AIDA –RUFORUM support, LVEMP, NARL, MUK, team members



## PASTORAL ADAPTATION STRATEGIES TO CLIMATE SHOCKS IN RANGELANDS OF SOUTH WESTERN UGANDA

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### 1. Introduction

Africa is one of most vulnerable continent to the impacts of climate change. (UNDP, 2008). In Uganda, livestock rearing is largely rain-fed and heavily dependent on water availability. Therefore, negative climate change and variability impacts are likely to influence the productivity and suitability of livestock mobility patterns in the country. Pastoralists employ various coping strategies to deal with climate stress. However, they are increasingly less able to do so, and more pastoralists are losing their livestock assets and their livelihoods, (Magda N. et al, 2009). It is important, therefore, to build pastoral capacities to adapt to these changes.

This study focused on establishing the major climatic shocks in the past three decades amongst pastoralists and identifying the coping responses used in the rangelands of the cattle corridor (South Western Uganda).

### 2. Methodology

The study was conducted in Rakai and Kiruhura districts located in the cattle corridor of Uganda, (Figure 1). Data was collected through individual and group discussions. These were composed of adult pastoralist. A checklist with key questions was used in the three group discussions carried out. Two sub counties, Kacheera and Nyakashashara, were selected randomly from the 2 respective districts.

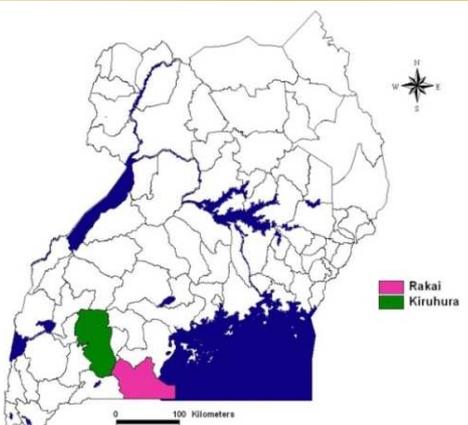


Figure1: Location map for the study area

### 3.Results (preliminary)

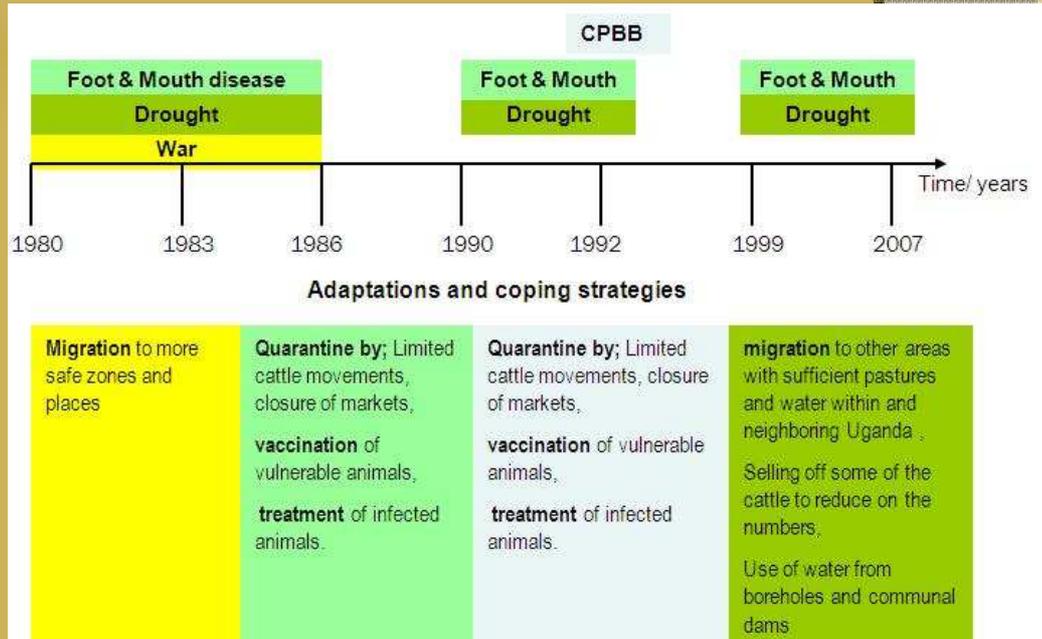


Figure 2: Occurrence of events (shocks) over a period of time & coping strategies

From figure 2 above, the major climatic shock is drought that has directly led to other Challenges faced to date including: Insufficient water, ( Figure 3), Cattle disease outbreaks, Wild animals from the park, Lack of sufficient pastures, Animal Parasites especially ticks, Fire outbreaks. Other challenges that were identified besides the above are: Poor transport network, Lack of accessible and affordable drugs, Cattle thefts, Insufficient veterinary services, and Lack of market for their products and Lack of enough land.

### 4. Key lessons

The major climatic shocks experienced by pastoralists in the last three decades are Contagious Bovine Pleuropneumonia (CBPP), Foot and mouth diseases and frequent and prolonged drought. Its recommended that a detailed study be done to better understand and assess the adaptive capacity and resilience of pastoralists to climate change.



Figure 3: A dried up communal dam

### 5. References

Magda N, et al (2009). Pastoralism and Climate Change, Enabling adaptive capacity: Regional Pastoral Livelihoods Advocacy Project, ODI .  
 UNDP - (2008). Human Development Report 2007/2008, Fighting Climate Change, Human solidarity in a divided world.

**Acknowledgements:** RUFORUM-AIDA for the funding, MUK Team.



AGRHYMET

Projet Agricultural Innovation in Dryland Africa (AIDA)



Niger Basin Silting Control Programme (BN/PLCE)

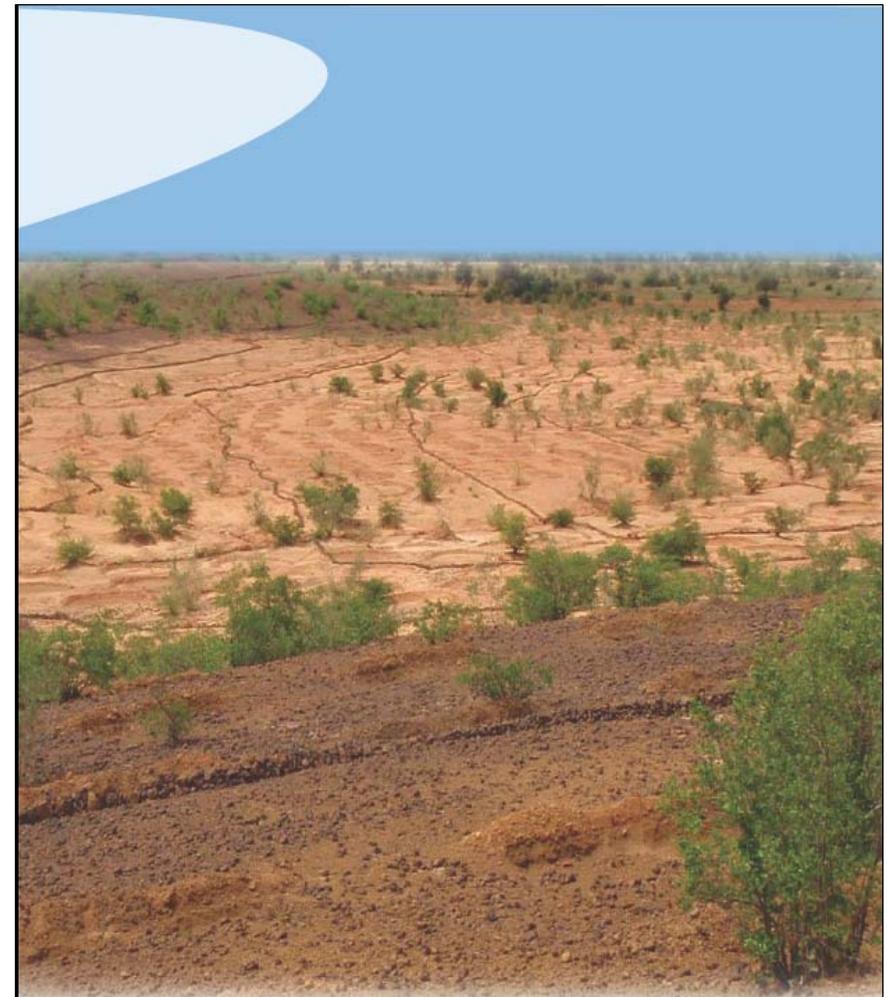
## Erosion control and restoration of degraded soils in the Niger Basin

### COMPILATION OF TECHNICAL ADVICE SHEETS



 Drafted by : Kader Mohamed PLCE/BN Niger

Design and layout by UCID/AGRHYMET Regional Centre



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Project title: **Agricultural Innovation in Dryland Africa**

## **AIDA FINAL REPORT – Annexes**

