



Making dryland research matter

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



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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)^[1] 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.

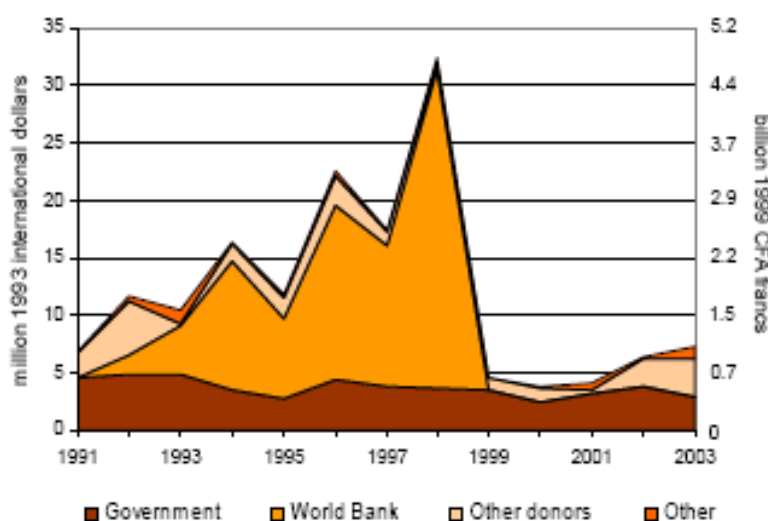


Figure 1: Funding of Niger's Agricultural research institute, INRAN. Notes: "Other" includes internally generated income, contributions from private enterprises, and non-identified sources of income. INRAN's funding levels are lower than its expenditure levels because estimated salaries for expatriates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

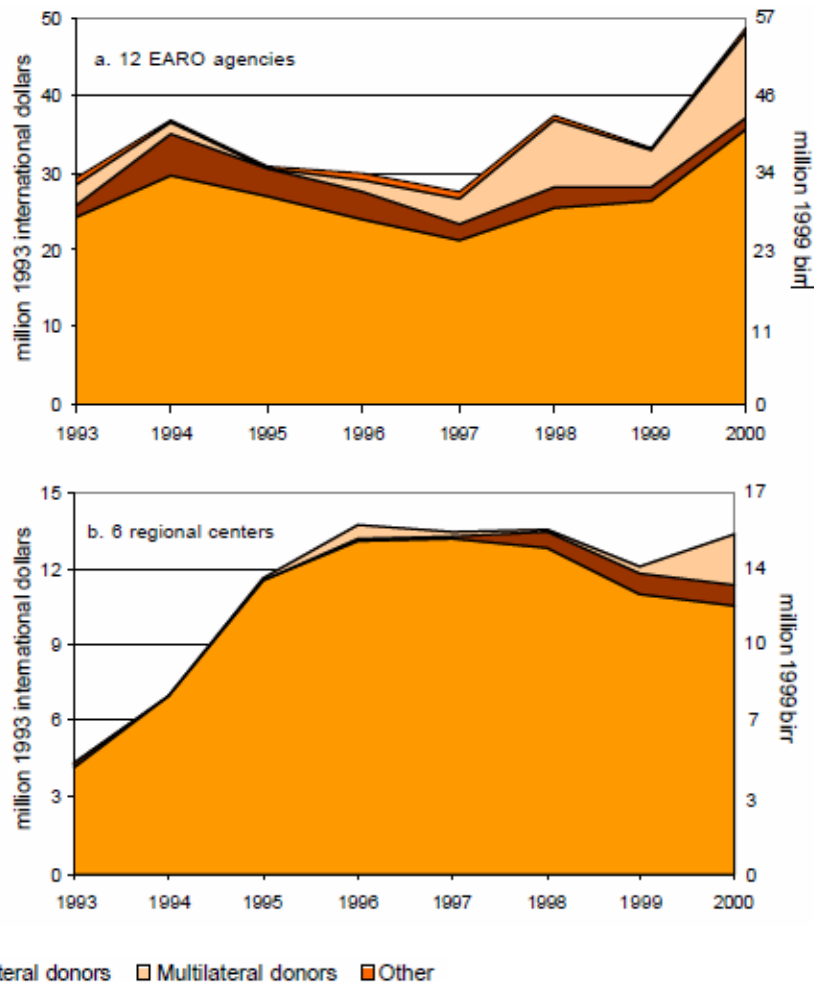


Figure 2: Funding to Ethiopia's agricultural research system. (Source: IFPRI–ISNAR–ASARECA 2001–02).

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 ICRISAT 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 (Hagblade 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 2nd 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 availably
- 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 km². 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 owed 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. And 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 to 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 in stead 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 value 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.