



N2Africa Phase II Launch in Tanzania

Summary Report

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Submission date: 13 March, 2014

N2Africa

**Putting nitrogen fixation to work
for smallholder farmers in Africa**



N2Africa is a project funded by The Bill & Melinda Gates Foundation by a grant to Plant Production Systems, Wageningen University who lead the project together with CIAT-TSBF, IITA and many partners in the Democratic Republic of Congo, Ghana, Kenya, Malawi, Mozambique, Nigeria, Rwanda and Zimbabwe.

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Frederick Baijukya, 2014, N2Africa Phase II Launch in Tanzania; Summary Report, www.N2Africa.org, 57 pp.



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1 Introduction

N2Africa phase II was officially launched in Tanzania on 19th of February, 2014. The launch meeting was held at Landmark Mbezi Beach Hotel Dar es Salaam. The meeting was extended to 20th February, 2014 to plan for the implementation of year 1 activities. The meeting brought together a wide diversity of stakeholders from those in legume production, input development and supplies including seeds and fertilizers, processing, marketing, and regulatory bodies to policy makers. See Appendix 1 for participants to this meeting.

The launch meeting was used to i) to introduce the N2Africa to potential partners in Tanzania, ii) forge partnership with key actors in bean, soyabean and groundnut value chain and iii) plan for implementation of year 1 project activities. Participants had opportunity to receive and discuss reports to accomplishment on preparatory initiatives in of the project in Tanzania (bridging grant). Activity planning in the second day focused on agronomy; women's empowerment; stakeholder- platforms, input and output delivery systems.



Figure 1.1: Group photo Tanzania Launch meeting



2 Overview of N2Africa

2.1 Introduction to N2Africa Phase II

by Ken Giller (see full presentation in Appendix 2)

The project "Putting nitrogen fixation to work for smallholder farmers in Africa (N2Africa) is funded by Bill & Melinda Gates Foundation; led by Wageningen University, IITA, ILRI and AGRA with many national partners.

Total funding is US\$25M.

Focus is on enhancing production of the major grain legumes; common bean, cowpea, groundnut and soyabean. Chickpea and Faba bean are also considered in Ethiopia.

Vision of Success of N2Africa phase II: is to build sustainable, long-term partnerships to enable African smallholder farmers to benefit from symbiotic N₂-fixation by grain legumes through effective production technologies including inoculants and fertilizers. The legacy will be strong national expertise in grain legume production and N₂-fixation research and development. The capacity built will sustain the pipeline and delivery of continuous improvement in legume production technologies tailored to local settings. Activities will focus on cowpea, groundnut and soyabean in Ghana and Nigeria, on common bean, cowpea, groundnut and soyabean in Tanzania and Uganda, and on common bean, soyabean, chickpea and faba bean in Ethiopia. Within four years, building on local expertise, legume production will be enhanced in the major legume growing areas in of each partner country, providing, opportunities for the poor and addressing gender disparities. New value chains will be established and the food and nutritional security of the poor will be enhanced. In Phase II, N2Africa will reach more than 550,000 farmers with a return on investment of US\$3.5 for each US\$ invested.

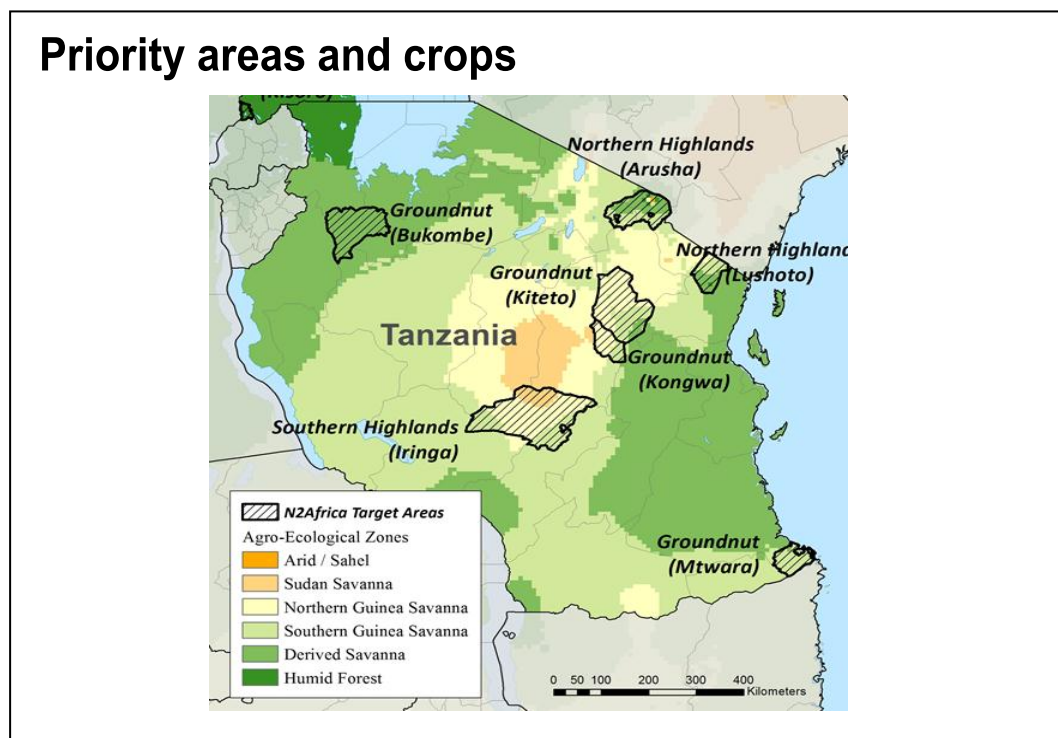


Figure 2.1: Priority area and crops



N2Africa objectives are:

1. Project strategy, coordination and implementation and capacity strengthening.
2. Delivery and dissemination, sustainable input supply, and market access.
3. Empower women to increase benefits from legume production.
4. Tailor and adapt legume technologies to close yield gaps and expand the area of legume production within the farm.
5. Enable learning and assess impacts at scale through strategic M&E.

N2Africa exit strategy:

- To build national capacity to lead Development to Research (D2R) activities across the legume value chain.
- to develop strategic partnerships to share outcomes and disseminate legume technologies (international and local NGOs, NARES and private partners).
- to establish national stakeholder platforms of public and private partners to support local business clusters in key production areas.

Gender mainstreaming:

- N2Africa will address gender equity in all aspects.
- Production of nutritionally improved traditional and legume-based novel food products.
- Labour saving technologies for women.
- Meet the food and nutritional needs of the poorest households

Questions /comments

- Focus legumes should expand to include pigeon pea and chickpea because these are legumes fetching premium prices in foreign markets.
There is a limit to what the project can do given available resources (financial and human). However the mentioned legumes are being addressed by other initiatives including TL II and SIMLESA projects which N2Africa has link with. Partners are welcome to extend experiences gained from working with beans, soyabean and groundnuts to other types of grain legumes.
- Low investment in legume production (attributed to poor markets) and poor extension services is contributing to poor production. N2Africa is addressing these two production constrains and farmers stand to benefit from it.
- N2Africa is promoting the use of rhizobia inoculants but they are not readily available in country. Results from trials with soyabean in Southern Tanzania are fascinating. What are plans to make rhizobia inoculants them available?
 - Short and long-term plans are thought. Short-term plans include registering the best performing products (Legufix from UK and Biofix from MEA ltd Kenya). The long term plan is to work with a private company (Crop Bioscience Solution) who is interested in manufacturing the inoculants. For both plans, we need quality control mechanisms in place.
- Traditionally men have control over production resources. N2Africa need to have a household focus targeting specific activities where women can directly benefit from growing or trading with legumes. This will require an understanding of the farming system and social construct in N2Africa mandate areas.

Action points

- Compile available results on the performance of rhizobia inoculants for submission to the Tanzania Fertilizer Regulatory Agency in order to facilitate registration of inoculants (Freddy Bajjukya in collaboration with COMPRO coordinator, assisted by Suzan Ikeru).



- Set-up quality control facilities at SUA or Nelson Mandela AIST. The decision to what centre need to be made quickly including developing SOP (Freddy, Patrick and COMPRO coordinator, guided by TFRA).
- There is a need to work with a gender specialist to identify and support gender related activities (country coordinator).

2.2 Accomplishment on preparatory initiatives (Bridging phase)

2.2.1 N2Africa preparatory activities in Tanzania

By Freddy Baijukya (see Appendix 3)

Activities included desk study (in October 2012) to gathered information on agronomy, farming systems, ongoing legume projects and potential partners. This was followed by a stakeholder meeting in Morogoro (in November 2012) to explore N2Africa opportunities in Tanzania which identified: the focus legumes (common bean, soyabean and groundnut); project areas- Northern zone (Arumeru, Hai, Kilimanjaro and Lushot Districts), Sothern (Mtwara); Southern Highlands (Mbeya, Iringa, Njpombe and Ruvuma district); Central (Kongwa and Kitero) and lake Zone (Bukomba). Four partners namely CRS (through Soya ni Pesa project), ARI Uyole, ARI Selian and Nelson Mandela African Institution of Science and Technology (NM-AIST) started implementing activities with N2Africa.

2.2.2 Field trials and demonstration activities in Northern Tanzania during long rains 2013

By Patrick Ndakidemi (see Appendix 4)

Presentation summarizes results obtained from the trials conducted in four districts (Arumeru, Hai, Kilimanjaro and Lushoto) to evaluate the performance of promising bean varieties at different locations and their response to phosphorus (P) fertilizer and rhizobium inoculants applications.

Questions /comments

- Results show huge differences in yield among the bean varieties and with P application but no noticeable yield increase due to rhizobia inoculation as claimed. The data need to be supported with statistical measures e.g. standard errors, LSDs, etc.
- Treatments did not include a control (no inoculant, no P), to measure the contribution of applied P or inoculants. This makes it difficult to arrive at convincing conclusions.
- Soils in northern Tanzania notably Lushoto are nutrients depleted and do not simply respond to application of N, P and K. A systematic diagnosis of other limiting nutrient is warranted.
- Shortage of quality staking is an issue in Hai and Kilimanjaro but not in Lushoto and Arumeru. This is because of availability of staking materials and farmers in Lushoto and Arumeru have knowledge on use of staking as introduced by SECAP project. Work on alternative staking materials /methods is required to address the staking problems in Hai and Moshi.
- A comment related to testing of climbing beans at altitude below 1500 m: Improved climbing bean varieties (MACs) suited for mid altitude (1300-1500 m) areas are available from Rwanda and already introduced in the country by PABRA. These varieties yield higher compared to bushy types and have desirable attributes by farmer.



2.2.3 Evaluation of soyabean varieties for adaptation and response to inoculation in Southern highlands of Tanzania

By Aida Amalenga (see Appendix 5)

The project aims at evaluating released and introduced soyabean varieties for wider adaptability and response to rhizobia inoculation. The objective is diversify soyabean germplasm in Tanzania to suit different needs.

Questions /comments

- Availability of suitable soyabean varieties is a big issue to the development of soyabean sub-sector in Tanzania. In Tanzania many farmers are planting very old varieties. e.g. bossier and safari which appear to have segregated. Newly released varieties e.g. Uyole 1 and 2 are not performing in lower altitude areas.
- The quality of soyabean seed obtained from ASA in 2012 season was very poor with germination below 40%. The problem is associated with long storage period and probably poor of seed. soyabean seeds loose viability quickly and need proper storage. The current work on variety evaluation will address the concern. Seed Co is also working to release new soyabean varieties most suited for oil extrusion.
- One participant asked about the involvement of TOSCI in the SADC seed certification. These is happening, but still at a higher policy level.
- There is a call for the agronomy research to take into account the changing climate. We also need to understand the best planting time of soyabean in Southern Tanzania due to prolonged rain season (3-5 moths).
- The harmonised seed policy of East Africa Community (EAC) allows for fast tracking of crop varieties released in one countries into the other provided that due procedures are followed when introducing the varieties. N2Africa need to take this advantage.

Action point: Freddy contact TOSCI on procedures to fast track new materials and work with the breeder at ARI Uyole to introduce and test new soyabean.

2.2.4 Soya ni Pesa (SnP) Project: Achievements & Way Forward 2012/13

By Abubakary Kijoji (see Appendix 6)

Soya ni Pesa is a four year initiative, financed by U.S. Department of agriculture to strengthen the soyabean value chain in Tanzania. It is working with smallholder farmers and facilitating their integration into markets, targeting the poultry industry. The project operates in Ruvuma, Njombe and Morogoro regions. Soya ni Pesa is partnering with N2Africa to improve soyabean productivity through use of P based fertilisers, improved seed and rhizobia inoculants.

Questions / comments

- The soyabean price offered to Soya ni Pesa farmers is well above the world market price. This need to be checked to avoid demoralisation of farmers when the volumes of soyabean goes high.
 - Business are operating on the basis of demand and supply and farmers are aware of this.
- On the question of sustainable supply of quality soyabean seed it was recommended to:
 - Identify and train farmers on quality seed production and provide them with necessary support.
 - - Develop a seed repayment strategy for example 'pass on gift system' to benefit more households and for sustainability



2.3 Project launch

N2Africa was officially launched by the Director for Research and Development in the Ministry of Agriculture, Food Security and Cooperatives, Dr Fidelis Myaka on behalf of the Permanent Secretary Ms Sophia Speaking at the event, Dr Myaka lauded the project for singling out legumes. He said despite their obvious benefit to the country's food security, employment, and even contribution to GDP, their productivity was low and yields were far below their potential.

"The application of scientific knowledge, especially by smallholder farmers, has always been constrained by poor targeting of the technologies to the diversity of farmers and farming conditions, poor packaging of technologies, and issues relating to input supply and output market, said Dr Myaka. I am aware that N2Africa's approach puts into consideration all these factors through farming systems analysis to target technologies to the farming conditions of smallholder farmers and through a value chain approach," he added.

He also noted "N2Africa is structured to introduce famers to entrepreneurship and it is envisaged that through this program farmers would develop knowledge, attitudes, skills and aspirations needed for success. Such skill are more appropriate to women, not only in being self-employed and engaged in entrepreneurship, but also in contributing to society and the country economy.

2.4 Project implementation arrangements

By Bernard Vanlauwe (see Appendix 7)

Implementation plans of N2Africa phase I was on:

- Proof of concept
- Moving to scale

Important aspects of the implementation plans of N2Africa phase II are:

- Institutionalization
- Sustainability

N2Africa phase II is a 'four'-partite à Wageningen University (WUR), International Institute of Tropical Agriculture (IITA), International Livestock Research Institute (ILRI) and Alliance for Green Revolution in Africa (AGRA), The consortium will provide oversight to the country teams and ensure consistence in terms of research and dissemination approaches.

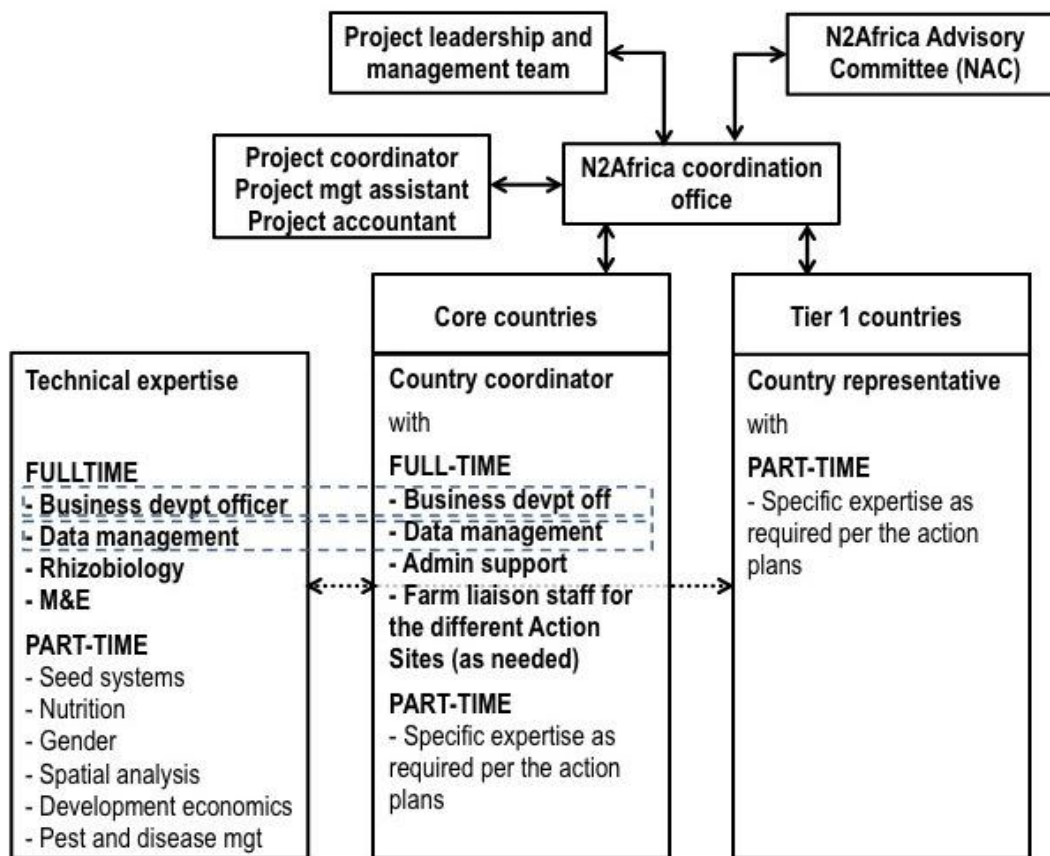


Figure 2.2: Structure of N2Africa

Questions /comments

- Will the national positions be widely advertised so that interested people can apply? The answer was yes. The position of national coordinator was advertised and has been filled. Positions of BDO, Data manager and Admin assistant will be advertised soon by IITA Tanzania. Keep your eyes and ears open and be ready to apply.
- There is need to look for indigenous rhizobia strains and fit those into the N2Africa dissemination work but there might not be enough time for this considering the lifespan of the project. Agronomic research takes time; some of the trials shown in the presentation are multi-year trials, so the question is how that is going to benefit D&D now. Since N2Africa is a research and development project, we know already that we have the best germplasm. We will try to assemble the best varieties in partnership with national and international breeding programs. Elite rhizobia strains can be introduced and multiplied with increasing demand

2.5 Characterisation and stratification of legume producers and production systems

By Andrew Farrow (see Appendix 8)

The aim is:

- to embed G x E x M within market and institutional context .
- Increase understanding of adoption of technologies minimizing the influence of constraints that cannot be controlled but which have an effect on defining "fit" of technologies.



Practical objective

- Provides a structure of domains for sampling
- Selecting action sites for implementation and evaluation (e.g. baseline)

Questions /Comments

Stratify those constraints that cannot be controlled but which will have an effect on the 'fit'



3 Planning of year 1 activities

3.1 N2Africa result frame work

The result frame work was presented by Bernard Vanlauwe. "It should be treated as is a project *bible*. How good we are implementing it will be part of evaluation".

Key points:

- **Institutionalization: we need to forge partnership for research**
 - Legume agronomy (varieties, inputs, cropping systems, etc) towards intensification of legume production.
 - Rhizobiology towards the identification and deployment of effective and competitive rhizobia.

- **Sustainability: Partnerships for development:**
 - Inoculant and fertilizer supply
 - Outputs (legume value chains)
 - Knowledge
 - Policy

- **Women empowerment**
 - Legumes as a 'women' crop.
 - Legumes as a source of protein/nutrition.

- **Project planning and M&E**
 - → Formal: Organize seasonal/yearly project-wide and country-specific planning workshops to define roles and responsibilities (this should happen yearly)
 - Informal: Field visits, meetings with partners
 - M&E: 'Learning grant'

3.2 Group work

After presentation of result frame work, participants split up into four break-out groups around major themes (see Table below). The groups identified the sub-activities around the main activities for year 1, their timing and indicated responsible person/organisation for implementation.

Group	Theme	Related objective
1	Stakeholder platforms and partnerships	2
2	Delivery and dissemination, sustainable input supply and Market Access	2
3	Empower women to increase benefits from legume production	3
4	Agronomy focusing on soyabean	4
5	Agronomy focusing on bush bean	4
6	Agronomy focusing on groundnut	4



3.2.1 Feedback on group activities

3.2.2 Working group on Platforms and partnerships

Terms of Reference of platforms *vis a vis* other bilateral interactions e.g. N2Africa and CRS which have an agreement / MoU.

1. What is the purpose of the platform?

1. inform and influence national policy or
2. ensure that as much local soyabean is sold to a market.

2. What are the boundaries of the platform?

PPP – National level -> DAO to farmers to traders, government needs to be kept in the loop.

Different levels of platforms.

- I. national
- II. district
- III. farmers

Federal structure in Tanzania – stick to it and work with it.

3. How wide are the platforms?

Key actors => those that address bottlenecks along the chains – one of the ToRs is to identify those bottlenecks.

- MoUs need to be drawn up earlier than envisaged.
- Model of engaging with the farmers – contract farmers.

Two branches: N2Africa led and Partner led.

4. How to sustain platforms?

- ETG warehouse, other services and mechanisms to sustain (the value chain or the platform)
- Legal status of platforms – constitution, legal entity?

5. How to identify partners?

- Some partners along whole Value Chain
- Some partners technical

6. Top-down vs bottom-up?

Top-down because of legalities, bottom-up because of practicalities and because of principles of the project.

Platform Terms of Reference definition as a sub-activity

PPP learning => forum

7. Different ToRs country specific or same ToR across countries?

- Country specific because different experience of platforms and existing structures



8. Who is responsible?

- Country coordinator

.....but can engage project coordinator and other support (lots of literature of platform establishment and management)

- Look to build on existing platforms, example of DAICOs in Tanzania.

Order of activities:

- 1.3.1 - By Q2 of year 1, potential partners operating within priority legume value chains mapped
- 1.3.2 - By Q3 of year 2, MoUs with priority partners in each of the target countries signed
- - By Q2 of year 1, N2Africa stakeholder platforms operationalized
- - By Q4 of years 1-4, stakeholders agree on specific roles and responsibilities across the various N2Africa objectives

Questions /comments

- For more efficient, we need to work with the existing platforms provided that we have our agenda clear. MVIWATA has established multitudes of platforms available in N2Africa mandate areas. N2Africa is invited to join.
- It may be costly to run platforms. Here, we need to clearly define roles of each member. There are guidelines on how to form and run innovation platforms (e.g. value chain development by ILRI). Experiences can be borrowed from there.
- Do we need innovation platform or Public Private Partnerships (PPP). We probably need both because, Innovation Platforms are short lived (working to solve a certain problem) while PPPs long lasting and essential to drive development of the value chain(s).
- Export Trading Group (ETG) is capacity building and linking farmers to market through contract trading model. N2Africa is invited to collaborate.

3.2.3 Working group on Delivery and Dissemination, sustainable input supply and Market Access

Activity	Sub-activities	Responsible
2.2	2.2.1 Adopt, review existing guidelines and the dissemination for legumes. 2.2.1.1 Assemble the guidelines 2.2.1.2 Conduct partners workshop to evaluate and validate the guidelines for dissemination.	Partners
	2.2.2 Establish and set the number of (female and male) to be involved in the project locations (giving priority to female)	From Project document
	2.2.3 Calculate the cost benefit analysis(returns on investment)	Responsible development organization in the project location (CRS, Clinton Foundation, Faida MaLi)
2.3	2.3.1 Identify favourable radio stations mostly listened by smallholder farmers.	Country coordinator, Faida MaLi



	2.3.2 Prepare ICT based programs to be aired on the effectiveness of N2Africa technology and through mobile phones response to the selected radio stations.	Responsible development organization in the project location (e.g. Faida MaLi, Clinton Foundation, CRS)
	2.3.3 Select newspapers favourable for smallholder farmers; in the project locations prepare news script on N2Africa technology research learning cycles that encourage women inclusion in the project.	Responsible development organization in the project location
	2.3.3 Identify local newspapers mostly preferred by farmers and send adverts on the effectiveness and importance of N2Africa technologies.	Responsible development organization in the project location
2.4	2.4.1 Conduct stakeholders meetings at regional level to raise awareness, introduce the project and intervention locations to get their support and ownership.	Responsible development organization in the project location (Faida MaLi)
	2.4.2 Conduct stakeholders meetings at Districts level to raise awareness, introduce the project to get their support, ownership and highlight the location for intervention.	Country coordinator, responsible development organization in the project location
	2.4.2 Conduct stakeholders meetings at village level raise awareness, introduce the project to get their support and develop mobilization program of smallholder farmers to participate in the project.	Responsible development organization in the project location
	2.4.3 Mobilize and sensitize smallholder farmers share the cost benefit analysis and register willing smallholder farmers to participate in the project.	Responsible development organization in the project location)
	2.4.3 Prepare comprehensive report on the sensitization, mobilization up to registration of farmers.	Responsible development organization in the location
2.5	2.5.1 Conduct identification of reputable inoculants/fertilizers dealers.	The project legume technology team and the Responsible development organization in the location
	2.5.1 Facilitate the identified inoculants/fertilizers dealers and support in the installation of inoculants production plant.	Country coordinator
	2.5.2 Facilitate (B2B) business platforms between; fertilizer companies, retailers and small holder producers to be able to access inoculants and fertilizers.	The project legume technology team and the Responsible development organization in the location (Faida MaLi)
2.7	2.7.1 Conduct identification of agro-input dealers and assess reputable ones in the project locations.	The project legume technology team and the Responsible development organization in the location (Faida MaLi)
	2.7.3 Facilitate agro-input dealers' linkage to smallholder farmers and the most optimum supply mechanism for inputs (B2B).	The project legume technology team and the Responsible development organization in the location (Faida MaLi)



2.8	2.8.1 Conduct identification of smallholder farmers groups and association/cooperatives/marketing organizations in the project locations and assess their them (conduct situation analysis)	Responsible development organization in the project location (Faida MaLi)
	2.8.2 Conduct mobilization and sensitization to form producer groups/associations/marketing organizations for produce collection, bulking and marketing	Responsible development organization in the project location (Faida MaLi)
	2.8.3 Conduct value chain study/market study to identify potential legume market outlets in the project location and beyond.	Responsible development organization, BDO
	2.8.4 Conduct training to smallholder farmers on groups organizational, entrepreneurial, good governance, farming as business, contracting, marketing and gender in agribusiness skills.	Responsible development organization in the project location (Faida MaLi)
	2.8.5 Facilitate linkages (B2B) between buyers and smallholder farmers in a contracting arrangement (forward contracting, spot marketing, letters on Intent)	Responsible development organization in the project location (Faida MaLi)
	2.8.6 Conduct identification of value addition possibilities support and facilitate smallholder farmers groups in the process.	Responsible development organization in the project location (Faida MaLi)
	2.8.7 Conduct end of seasons evaluation workshop with partners to evaluate and plan for the next season while addressing any weaknesses.	Responsible development organization in the project location
	2.8.8 Identify local existing microfinance possibilities in the project location and link them to smallholder groups/associations/cooperatives/marketing organizations for sustainability.	Responsible development organization in the project location (Faida MaLi)
	2.8.9 Conduct training to small holder farmers groups /associations/cooperatives/marketing organizations on access to microfinance to invest for sustainability purpose.	Responsible development organization in the project location
	2.8.9.1 Develop and sign MoU with Local Government authorities in the project locations.	Responsible development organization in the project location
	2.8.9.2 Facilitate identification and formation of bulking and marketing centres for smallholder produce in project locations.	Group leaders/ members and the responsible development organization in the project location
	2.8.9.3 Participatory identifying of one of the educated group members in the /associations/cooperatives/marketing organizations and provide training on the bulking centre management and documentation.	Group members and the responsible development organization in the project location
	2.8.9.3 Conduct quarterly partners reporting and planning meetings to share successes and challenges and plan forward.	All partners and responsible development organization in the project location
	2.8.9.4 Conduct monitoring and evaluation follow-up to collect data and relevant information on the performance of the intervention for value for money.	Responsible development organization in the project location (Faida MaLi)



Questions /comments

- We need to ensure that inputs we promote are available to avoid embarrassment by farmers.
- On communication, we need to link to some of existing initiatives e.g. Ukulima wa Kisasa magazine and Farm Radio, MVIWATA mobile phone program, etc.
- It is risky to spread out quickly. Spreading out should conform to N2Africa priorities.
- N2Africa need to facilitate farmers participation to agricultural shows.

3.2.4 Working group on empower women to increase benefits from legume production

- Gender mapping of the role of women along the value chain
- Three points of intervention – i) Labour saving, ii) Women's marketing, iii) use of legumes in nutrition
- Beans – women's crop for food, yet women often sell a lot of the beans because they yield early when cash is needed
- Small-scale women bean traders – women take loans from village saving scheme and use it to trade beans and pay back the loan
- Explore possible role of women's marketing groups to explore possibility of aggregated volumes
- Connect women's groups to companies trading in dry beans – forward delivery contracts could avoid cash flow problems and avoid selling at low prices
- Pre-emergence herbicides – reduce demands on labour for weeding
- Understand women's time allocation to legume production – and explore opportunities for simple technology for labour-saving devices
- Nutritional training using soyabean – as fortified flour, soymilk etc – potential benefits of soyabean not widely known, can substitute for expensive cows' milk
- Understand cultural barriers to changing food preparation
- Recipes for beans, groundnuts etc fortified foods.

Questions /comments

- Women empowerment should extend to include those who are in marketing grain and legume products.

3.2.5 Working groups on agronomy

Considered questions:

- - What are the simple treatments we should use on D &D plots?
- - How should we go about choosing locations (+farmers) for the demos?
- - Are there conflicts/compromises with the way we work now?

A: Climbing bean

Treatments (input)

1. Inoculants
2. Inoculants + P (30kg P /ha)
3. Farm yard manure (FYM) 5 kg /ha
4. Control plots

Treatment (staking methods and materials)

1. Stakes
2. Poles + string + sisal ropes



Locations

- High altitude 71500 masl
- Along the main road/school or/and communicating centers

B: Bush bean

*Currently no good available inoculants so not wise to introduce it in the D&D

- -Practical to include use of the fertilizers/manure etc.
- -Focusing on existing farmers cultivating practices and ways to improve on them,
- -Mode of planting. Monocropping or intercropping (Mainly determined by the land area availability- target both systems.
- -Determine the planting season (Masika)- long rains March-June and (vuli)- short rains Oct-Dec, irrigated and fed.
- -Choice of varieties to be compared with the local varieties farmers are used to.

Area selection

- -Where the bush beans thrive
- -Proximity to market areas
- -Gender
- -Wealth
- -Agro ecological zones- altitudes. (Agro ecological zones distribute equally across different gradients.

C: Soya Beans

1. Treatments

- Control
- Inoculants
- Inoculants+ P(DAP)
- P only
- Inoculants +K (MOP)
- K only
- Inoculants +P+K
- P+K

of varieties (14)

Plot size (10 x10 m minimum)

Site Selection to consider

- History of soya production
- Soil characteristics
- Market Accessibility
- Presence of other Value-Chain Actors
- Agro-Ecology
- Farmer Acceptability

*Baseline Study Required to identify the conflicts from farmers and other actors.

-use legal format/channels e.g. district agriculture and irrigation office (DAICO), District extension office etc.)

D: Groundnut

Treatments



- *Business model (marketable varieties popular in the region- Pendo, Mnanje)*
- *Basis (low P and Ca)*
 - Minjingu (15 kg P ha⁻¹)
 - Gypsum (100 kg ha⁻¹)
 - Minjinju+ Gypsum
 - Farmers Practice (no input)

Site selection

- Market access; good and poor
- Soil type variations (Afsis, reconnaissance)
- Rainfall distribution (rainfall distribution maps)
- Need places that many people can see!
- Not on abandoned fields

3.3 Way forward

- Information presented will be assembled together and distributed to all participants.
- Although N2Africa phase II is organised around a federal structure, consistency on implementation among participating is still needed to allow for meta-analysis across countries, thus the need for project master plans. The Information provided will be used to develop master plans on Agronomy, rhizobiology, Delivery and Dissemination, sustainable input supply, and market access, which will also be shared with all partners by April 2014.

3.4 Closing:

The meeting was officially closed by the Assistant Director for Crops research in the Ministry of Agriculture, Food Security and Cooperatives, Dr Hussein Mansoor by re-affirming commitment of the ministry to this project.



Appendix 1: Participants to N2Africa launch meeting

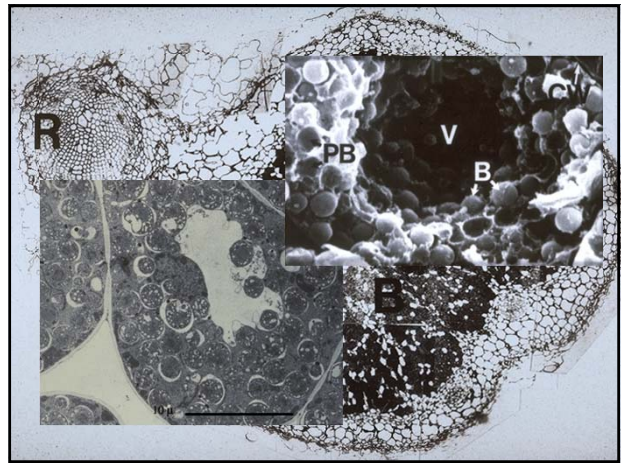
No	First name	Last name	Position	Organization
1	Dr. Fidelis	Myaka	Director Research and Development	Ministry of Agriculture
2	Dr. Hussein	Mansoor	Assistant Director Crop Research	Ministry of Agriculture
3	Prof. Patrick	Ndakidemi	Professor	NM-AIST
4	Dr. Zakaria	Malley	Centre Director	ARI Uyole
5	Mrs. Aida	Malenga	Agronomist	ARI- Uyole
6	Dr. Michael	Kilango	Plant breeder/Researcher	ARI- Uyole
7	Mr. Sosthenes	Kweka	Bean Breeder	ARI - Selian
8	Mr. John	Msaki	SARI	ARI Selian
9	Mr. Harun	Murithi	APO	IITA
10	Mr. Amsalu	Gebreselassie	Project Director	CRS
11	Mr. Kijoji	Abubakary	Soya ni Pesa- Project Officer- Production	CRS
12	Mr. Michael	Fredericksen	Director of Community outreach	Clinton Foundation Anchor Farm Tanzania
13	Dr. Susan	Ikerra	Executive Director	Tanzania Fertilizer Regulatory Authority
14	Mr. Amos	Projestus	Sales Manager	Minjingu mines
15	Mr. Thomas	Sillayo	General Manager	Faida Market Link – (Faida MaLi)
16	Mary	Rimoy	Horticulturist	Usambara Lishe Trust
17	Mamis	Mtwaenzi	Breeder	TOSCI
18	Ms Edith	Gathoni	Regional program Coordinator	VECO- EA
19	Mr Paul	Mbothia	Strategy Advisor	VECO EA
20	Ms Claire	Chemoiywa	Executive Assistant to CEO/Chairman	Export trading group




21	Dr. Elizabeth	Maeda	Head of research	USAID
22	Mr Denis	Mbagula	Program Coordinator	MUVEK
23	Mr. Jeff	Lewis	Consultant (SAGCOT)	Korongo ltd
24	Mr Japhet	Masigo	MVIWATA	Agronomist
25	Dr. Janeth	Bitegeko	Coordinator	Agriculture Council of Tanzania
26	Mr. Baldwin	Shuma	CEO	Tanzania Seed Trading Association
27	Gerald	Mollel	Research and Development Officer	KENMILLERS
28	Oliver	Ngomuo	Program manager	WVT
29	Gema	Nyanyagwa	Agricultural Officer	MAFSC
30	Mr. Rweyendela	Vaney	Country coordinator SSTO	AGRA-Tanzania
31	Dr. Edward	Baaars	BDO	IITA
32	Mrs. Joyce	Kessy	District crops officer	Moshi Rural District
33	Mr. Peter	Ebanyat	Scientist	Makerere University
34	Mr. Salvatory	Kundi	PARO	ARI-Ilonga
35	Ms. Heather	Oh	Manager for program development East Africa	Technoserve
36	Prof. Ken	Giller	Prof	Wageningen University
37	Bernard	Vanlauwe	Director , IITA CA	IITA
38	Andrew	Farrow	Scientist	Geografia
39	Frederick	Baijukya	Coentist	IITA




Appendix 2: Presentation by Ken Giller




N2Africa 


- Funded by Bill & Melinda Gates Foundation
- Led by Wageningen University, IITA, ILRI and AGRA with many national partners
- Total funding US\$25M
- Focus on enhancing production of the major grain legumes
 - Common bean, cowpea, groundnut and soyabean
 - Chickpea and faba bean in Ethiopia



Putting nitrogen fixation to work for smallholder farmers in Africa

Increasing inputs from N₂-fixation 

- Increase the area of land cropped with legumes (targeting of technologies)
- Increase legume productivity (agronomy, P-fertilizer)
- Select better legume varieties
- Select better rhizobium strains and inoculate
- Link to markets and create new enterprises to increase demand for legumes



Putting nitrogen fixation to work for smallholder farmers in Africa

Genotype × Environment × Management



$$(G_L \times G_R) \times E \times M$$

Where:

G_L = legume genotype

G_R = rhizobial strain

E = environment

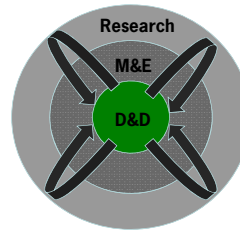
- climate (temperature x rainfall x daylength etc) – to encompass length of growing season etc.
- soils (nutrient limitations, acidity and toxicities)

M = management

- agronomy – inoculation, seeding rates, plant density (row spacing etc.), weeding, P fertilizer
- (diseases and pests are also a function of $G \times E \times M...$)

Putting nitrogen fixation to work for smallholder farmers in Africa

N2Africa is a development to research project



- Delivery and dissemination are the core
- Monitoring & evaluation provides the learning
- Research analyses and feeds back



Putting nitrogen fixation to work for smallholder farmers in Africa

N2Africa's approach



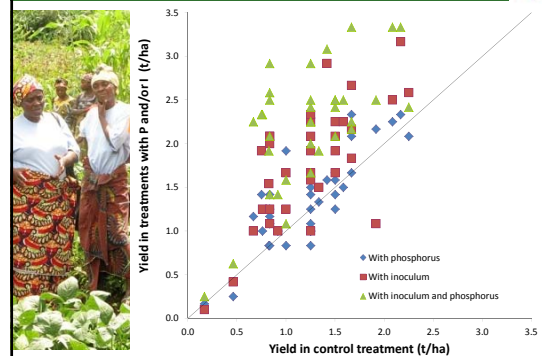
- Targeting of technologies:
 - From fields to farms and farming systems
 - From silver bullets to 'best fits'
- In each N2Africa country :
 - Demonstration plots with best-bet technologies
 - Dissemination: package of legume seeds, inoculants and BNF-technologies for farmers to test



Putting nitrogen fixation to work for smallholder farmers in Africa



Response to P and inoculation with soybean in DRC



N₂Africa demonstration trial results in Mushomo, Sud Kivu, DRC 2010

Response to inoculum and P



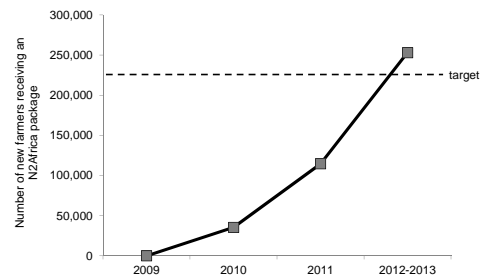
Putting nitrogen fixation to work for smallholder farmers in Africa



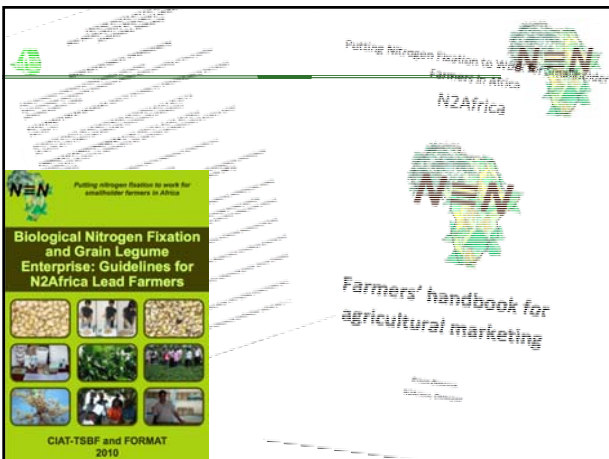
Large scale dissemination of legume technologies to 225,000 farmers



To benefit 225,000 households




Putting nitrogen fixation to work for smallholder farmers in Africa





Vision of Success




- to build **sustainable, long-term partnerships** to enable African smallholder farmers to benefit from symbiotic N₂-fixation by grain legumes through effective production technologies including inoculants and fertilizers
- The legacy will be **strong national expertise** in grain legume production and N₂-fixation research and development
- The capacity built will **sustain the pipeline** and delivery of **continuous improvement in legume production technologies** tailored to local settings.
- Activities will focus on **cowpea, groundnut and soybean in Ghana and Nigeria, on common bean, cowpea, groundnut and soybean in Tanzania and Uganda, and on common bean, soybean, chickpea and faba bean in Ethiopia**
- Within five years, building on local expertise, **legume production** will be **enhanced** in the major legume growing areas in of each partner country, providing **opportunities for the poor and addressing gender disparities**
- New **value chains** will be **established** and the **food and nutritional security of the poor** will be enhanced
- In Phase II, N2Africa will reach more than **550,000 farmers** with a return on investment of **US\$3.5 for each US\$ invested**

Putting nitrogen fixation to work for smallholder farmers in Africa

N2Africa THEORY OF CHANGE

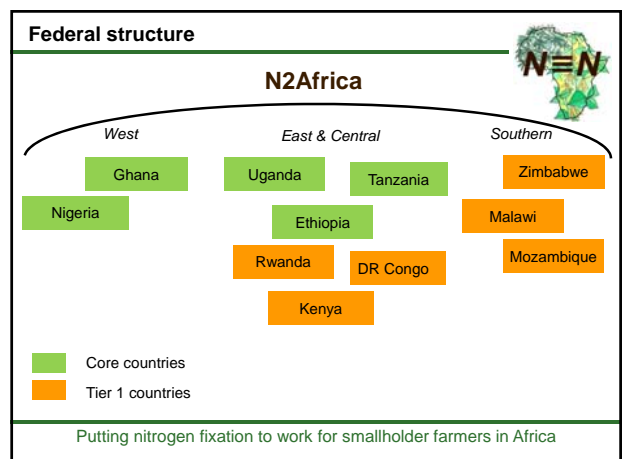
Challenge	N2Africa will...	To achieve...	Leads to...	Change in investment priority	Impact
Poor legume productivity	<ul style="list-style-type: none"> Address constraints to legume productivity Explain heterogeneous yields at farm and community levels Develop best-fit options for farmer testing 	<ul style="list-style-type: none"> Tools and methods for identifying entry points at farm level Options for improved legume productivity and N₂-fixation adopted and adopted 	<ul style="list-style-type: none"> Greater legume productivity and area under legumes Increased contribution of legumes to income, nutrition, and improved yield of subsequent crop also on women's plots Less drudgery, especially for women, and greater farm productivity 	<ul style="list-style-type: none"> Enhanced legume production and productivity at (sub)national scale Reduced poverty, improved income and nutrition for smallholder farmers Women and men obtain more equal share of benefits from legume technologies Sustainable use of natural resources Sufficient national capacity to pipeline emerging legumes technologies for smallholder farmers Sustainable input supply systems for legumes 	
Poor diets and weak support to women and very poor farmers	<ul style="list-style-type: none"> Develop intensification options targeted to poor and women farmers Target poor and women farmers with tailored legume-based technologies 	<ul style="list-style-type: none"> Availability, accessibility and affordability of (quality) seeds, inoculants and fertilizer for women as well as men More women farmers equipped with better post-harvest technologies and higher returns of women's labour and farm productivity 	<ul style="list-style-type: none"> Diversified nutritious diets for the poor, and women's engagement in markets Change towards gender sensitive decision-making concerning sales and control of productive assets for legume production 		
Lack of effective legume input supply and output market chains	<ul style="list-style-type: none"> Establish public-private partnerships Establish inoculant production facilities Facilitate agrodealer investment in target areas 	<ul style="list-style-type: none"> Improved farmer access to seed systems, inoculants and legume fertilizers Improved linkage of farmers to local and international legume markets Efficient post-harvest practices, technologies and value added products and enterprises benefiting women 	<ul style="list-style-type: none"> Women and men farmers regularly using inputs within sustainable rotations Increased and stable income from crop sales 		
Limited national capacity in legume technology research and dissemination	<ul style="list-style-type: none"> Collaborate closely with key national partners Provide training from technical to postgraduate level Support national networks for D2R 	<ul style="list-style-type: none"> A new cadre of African D2R scientists, development and gender specialists Independently functioning networks and partnerships in each country 	<ul style="list-style-type: none"> National teams leading all D2R activities Independent national research to equitable growth and development pipelines 		

Objectives



- Project strategy, coordination and implementation and capacity strengthening
- Delivery and dissemination, sustainable input supply, and market access
- Empower women to increase benefits from legume production
- Tailor and adapt legume technologies to close yield gaps and expand the area of legume production within the farm
- Enable learning and assess impacts at scale through strategic M&E

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Tier 1 countries



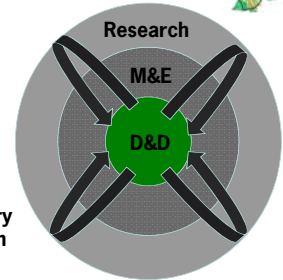
- Disseminating outcomes from Phase I at scale
- Institutionalize legume expertise within national systems
- Shift activities to other donors through co-funding

Putting nitrogen fixation to work for smallholder farmers in Africa

Development to research and adaptation



- Development through D&D at scale is the core
- M&E provides the learning
- Research analyses and feeds back
- Farmers **adapt** and **adopt**



D&D = Dissemination and delivery
M&E = Monitoring and Evaluation

Putting nitrogen fixation to work for smallholder farmers in Africa

A 'business-led' approach



- N2Africa exit strategy – to build national capacity to lead D2R activities across the legume value chain
- Develop strategic partnerships to share outcomes and disseminate legume technologies (International and local NGOs, NARES and private partners)
- National stakeholder platforms of public and private partners to support local business clusters in key production areas

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**Mudzi,
Zimbabwe**




Short-duration cowpea in West Africa




- Yields during hunger period
- Allows two crops within the season


Putting nitrogen fixation to work for smallholder farmers in Africa

Climbing beans in DRC

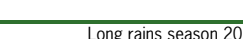


With manure





No manure




Long rains season 2010 in Sud Kivu, DRC



maize following maize

maize following climbing beans

Gender mainstreaming



- N2Africa will address gender inequity in all aspects
- Production of nutritionally improved traditional and legume-based novel food products
- Labour saving technologies for women
- Meet the food and nutritional needs of the poorest households

Putting nitrogen fixation to work for smallholder farmers in Africa

WU-IITA-ILRI-AGRA



- AGRA partnering and investing in N2Africa
- Private sector linkages – markets and agro-dealers
- Strong partnerships with development organisations







Putting nitrogen fixation to work for smallholder farmers in Africa


Some key partners



- Fertilizer companies - MEA Fertilizers in Kenya, Minjingu Mines & Fertilizer Ltd. & Greenbelt, Tanzania, and YARA in all countries.
- Inoculant companies - MEA Fertilizers, Kenya; Legume Technology, UK; Menagesha Biotech PLC, Ethiopia
- Pan-African Bean Research Alliance (PABRA) for varieties of common bean and seed systems, Tropical Legumes for other crops
- COMPRO-II on policy and regulations
- Scaling Seeds and Technologies Partnership in Africa (SSTP) - AGRA
- IFDC on input supply and agrodealers
- New international groundnut value chains (Unilever and Intersnack)
- African Soil Health Consortium (ASHC) for extension handbooks on legume production
- McKnight Foundation Collaborative Crop Research Programme (CCRP) on joint research themes

Putting nitrogen fixation to work for smallholder farmers in Africa

Conclusions



- N₂-fixing grain legumes flexible and 'best available for all farmers – rich and poor
- Focus on continuous learning and improvement
- Enhanced role of strategic public and private partners
- N2Africa has built a great network and collaboration across Africa
- Fantastic opportunity to deliver sustainable impacts and institutionalise N2Africa in all countries

Putting nitrogen fixation to work for smallholder farmers in Africa

For updates

www.N2Africa.org

www.N2Africa.tv

Lots of video resource materials

N₂Africa Podcaster - Monthly Newsletter

Putting nitrogen fixation to work for smallholder farmers in Africa



Appendix 3: Presentation by Freddy Baijukya



N2Africa preparatory activities in Tanzania

November 2012-February 2014

Identification of N2Africa opportunities in Tanzania



Desk study (October 2012) to gathered information on agronomy, farming systems, ongoing legume projects and potential partners.

Stakeholder meeting in Morogoro (November 2012) to explore N2Africa opportunities in Tanzania identified:

- Focus legumes
- Project areas
- Potential partners



**Immediate Collaboration with CRS- Soya ni Pesa project), testing use of irhizobia inoculant on soybean*



- February 2013: Planning meeting with stakeholders in Northern Tanzania to establish field activities
 - Baseline in northern Tanzania
 - Establishment of demonstration and adaptation trials in Meru, Hai, Kilimanjaro and Lushoto district.
- December 2013: MoU signed with ARI-Uyole to evaluate soybean varieties in Southern highlands (activity on going).
- January 2014: MoU with ARI Makutupota to lead baseline survey in Central, South and Southern highlands

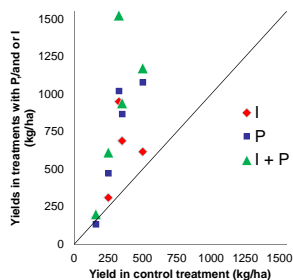
Other activities



- Establish relations with stakeholders.
- Procurement of equipment for the project
 - vehicles
 - Motorbikes
 - Green house
 - Laboratory equipment and supplies

In the preparatory phase we have built firm partnership and have made good investments for rapid implementation of of N2Africa

Huge variation in crop responses to inoculation and P application



Late planting, low quality seed lead to low yields

Figure: Soya ni Pesa demonstration plots in Ruvuma, 2013; I = inoculant, P = Phosphorus



Appendix 4: Presentation by Patrick Ndakidemi

PUTTING NITROGEN FIXATION TO WORK FOR SMALLHOLDER FARMERS IN AFRICA (N2AFRICA)

REPORT ON THE FIELD TRIALS AND DEMONSTRATION PLOTS UNDERTAKEN IN NORTHERN TANZANIA DURING LONG RAINS 2013

OUTLINE

- **Introduction**
 - Objectives of the project
 - Sites
 - Design and Data collection of Trials and Demonstration plots
- **Results and discussion**
 - Bush bean varieties performance
 - Climbing bean varieties performance
 - Bush bean varieties response to inoculants
 - Demonstration of climbing bean and bush bean varieties in farmers fields
- **Farmers' perception**
- **Conclusion**

INTRODUCTION

- In northern Tanzania, soils are deficient of Nitrogen, Phosphorus and potassium which are the essential elements for plant growth
- Farmers have been growing legumes as an approach to improve soil fertility as well as for their own consumption
- Lack of improved varieties and poor soil fertility makes productivity of these legumes poor
- However, availability of improved bean varieties and technology such as inoculation with appropriate *Rhizobium strain* and supplying limiting nutrients such as P and K may improve their productivity

INTRODUCTION CONT.....

- This is a report of the trials which were conducted in four districts of northern Tanzania with the aim of evaluating performance of promising bean varieties at different locations and treatment applications.

OBJECTIVES OF THE PROJECT

- To evaluate climbing and bush bean varieties for their response to fertilizer and inoculants application in Northern Tanzania.
- To determine the response of climbing bean and bush bean varieties to P, K, inoculants, cattle manure and their combination.
- To establish demonstration plots in farmers fields and evaluate the effects of input application (fertilizer and inoculant) versus no-input to selected climbing and bush beans varieties

TRIAL SITES

- The trials were established in northern Tanzania in the following districts
 - Arumeru
 - Moshi Rural
 - Hai and
 - Lushoto
- These trials covered relevant biophysical gradients
 - (a) Highlands (above 1200m), - climbing bean were planted
 - (b) Lower altitude (below 1200m) - bush bean were planted.

EXPERIMENTAL MATERIALS

- Bean seeds used were varieties released by Selian Agricultural Research Institute (SARI) - *Selian 05*, *Selian 06* and *Cheupe* as climbing bean varieties and *Lyamungu 85*, *Lyamungu 90*, *Selian 94*, *JESCA* and *Selian 97* as bush bean varieties.
- The inoculant used was BIOFIX - purchased from MEA Fertilizers Kenya.
- Fertilizer materials
 - Triple Super Phosphate (TSP 46%P₂O₅) and Muriate of Potash (50% K)
- Farm Yard Maure

DESIGN AND DATA COLLECTION OF TRIALS AND DEMONSTRATION PLOTS

- Trials and demo plots Design
 - The trials were established as one experiment with at least two replicates per site depending on the size of the available plot.
 - The trial sites were selected based on N-deficiency and homogeneity of the land i.e areas with no steep slopes.
- The demonstration plots were located in areas which were visible and accessible by many people.

RESULTS AND DISCUSSION

- In this report the following parameters will be discussed:
 - Crop stand (germination %)
 - Nodulation score
 - Above ground dry biomass
 - Final grain yield.
- Laboratory analysis for soils (Nutrient content and texture) and plant (N and P content) is on-going.

BUSH BEAN VARIETIES PERFORMANCE WITH RESPECT TO FERTILIZER AND INOCULATION ALONG SITES

- TSP applied at rate of 30 kg P/ha; KCl at 30 kg K/ha; Cattle manure at 2 t/ha.
- Crop stand was 75% (germination) in all sites except Hai district which was in a range of 60-74%.
- No particular trend for nodulation recorded perhaps supplementation of P and manure may improve nodulation
- Biomass above the ground ranged from 4 – 7.2 t/ha with no particular trend.
- In terms of yield, treatments with P, K and manure produced the best yield for both varieties.

BUSH BEAN VARIETIES PERFORMANCE WITH RESPECT TO FERTILIZER AND INOCUL.....

- Overall, Arumeru district had the highest grain yield, while Lushoto had the lowest yield
- **Table 1: Bush bean varieties response to fertilizer and inoculant application in Northern Tanzania**
- (a) Variety *Selian 97*

Inputs	Grain Yield (kg/ha)		
	Hai	Arumeru	Lushoto
Inoculant	1364.583	1268.000	647.000
Inoculant + Manure	1541.667	1960.750	735.500
Inoculant + P	2041.667	3017.750	884.500
Inoculant + P+K	1562.500	2214.250	1145.000
Inoculant + P + K + Manure	2072.917	2714.250	1216.000



Plate 1: Bush bean response to fertilizer and inoculation

BUSH VARIETIES PERFORMANCE WITH RESPECT TO FERTILIZER AND INOCUL.....

(b) Variety *JESCA*

Inputs	Grain Yield (kg/ha)		
	Hai	Arumeru	Lushoto
Inoculant	1583.3	1407.0	472.5
Inoculant + Manure	1552.0	2089.5	655.5
Inoculant + P	1854.1	2750.0	830.0
Inoculant + P+K	1906.2	2107.3	1050.5
Inoculant + P + K + Manure	2052.0	2821.3	1461.5

CLIMBING BEAN VARIETIES PERFORMANCE WITH RESPECT TO FERTILIZER AND INOCULATION ALONG SITES

- Germination (%) varied with sites, treatments and varieties ranging from 55- 97% with no particular trend
- Nodulation increased with manure application but ranged from 3-40 viable nodules
- Dry biomass above ground ranged from of 5-10 t/ha with more weight being recorded in plots with fertilizer input

CLIMBING BEAN VARIETIES PERFORMANCE WITH RESPECT TO FERTILIZER AND INOCULATION ALONG SITES

- Highest yield for climbing bean was observed in Lushoto > 3t/Ha in all varieties (*Selian 05*, *Selian 06*, and *Cheupe*)
- Variation in terms of treatment was observed in those with combination of manure and inorganic fertilizers.
- *Selian 05* produced highest yields in Lushoto and *Selian 06* performed best in Moshi (Table 2a,b&c).
- This may be attributed to soils and altitude among other factors

CLIMBING BEAN VARIETIES PERFORMANCE WITH RESPECT TO FERTILIZER AND INOCULATION ALONG SITES

Inputs	Grain Yield (kg/ha)		Inputs	Grain Yield (kg/ha)	
	Moshi	Lushoto		Moshi	Lushoto
Control –no input	781.250	504.5	Control –no input	806.250	595.25
Inoculant	1395.750	680.75	Inoculant	898.000	938.75
Inoculant + manure	927.250	943	Inoculant + manure	1406.500	1117.75
Inoculant + P+K	2302.250	3660.75	Inoculant + P+K	2029.250	3872.5
Inoculant + P + K + Manure	1645.750	3331.75	Inoculant + P + K + Manure	2812.500	3062.25

(a) Variety *Selian 05*

(b) Variety *Selian 06*



Plate 2: Staking climbing beans in Lushoto



Plate 3: Staking problems in Moshi

CLIMBING BEAN VARIETIES PERFORMANCE WITH RESPECT TO FERTILIZER AND INOCULATION ALONG SITES

Inputs	Grain Yield (kg/ha)	
	Moshi	Lushoto
Control –no input	1001.500	551.25
Inoculant	1497.750	1031.25
Inoculant + Manure	1166.500	1056
Inoculant + P+K	1562.500	2779.75
Inoculant + P + K + Manure	2804.250	3092.75

(c) Variety *Cheupe*

BUSH BEAN VARIETIES RESPONSE TO INOCULANT APPLICATION IN NORTHERN TANZANIA

- Germination (%) was above 75% in Moshi and Lushoto sites, while in Hai and Meru sites it was 56-72%.
- Nodule count had no particular trend and no differences were observed, nodule score ranged from 0- 34 in Meru sites, 0-12 in Hai sites, 0-3 in Lushoto site and 2-24 in Moshi sites.
- There is a need to supplement the soil with nutrients (such as P or Manure) to enhance nodulation
- Above ground dry biomass generally ranged from 5 to 6 t/ha with no particular trend

BUSH BEAN VARIETIES RESPONSE TO INOCULANT APPLICATION IN NORTHERN TANZANIA

- In terms of yield no difference btm those supplied with inoculants and those without inoculants.
- There differences in yield was observed in varieties.
- High yields were observed in *Lyamungu 90* (0.96 t/ha) in Lushoto and in the local variety (0.92) in Moshi.
- Lowest yields were recorded in *Lyamungu 85* (0.47-0.75 t/h) in both sites (Table 3).
- The small increase for those supplied with inoculant is an indication of the need to supplement inoculant with other inputs.

BUSH BEAN VARIETIES RESPONSE TO INOCULANT APPLICATION IN NORTHERN TANZANIA

○ Table 3: Bush bean varieties response to inoculant application in Northern Tanzania

Variety	Grain Yield (kg/ha)			
	Moshi		Lushoto	
	with	without	with	without
<i>Yellow(local)</i>	926.5	928.25	791	753
<i>Lyamungu 85</i>	473.25	478.25	754	750.5
<i>JESCA</i>	636.75	633.25	783	838.5
<i>Selian 97</i>	562.75	551.05	843.5	823
<i>Selian 94</i>	513.25	531.5	740	612
<i>Lyamungu 90</i>	566	565.75	963	918.5



Plate 4: Nodulation in Bush bean trial in Lushoto



Plate 5: Bush Bean Trial in Lushoto

DEMONSTRATION OF CLIMBING BEAN AND BUSH BEAN VARIETIES AND THEIR RESPONSE TO FERTILIZER AND INOCULANT APPLICATION

- TSP applied at 15 kg P/ha and cattle manure at 2 t/ha.
- In the demonstration plots, bush bean varieties had higher yields in all sites (Table 4).
- Highest yield in terms of districts were recorded in Moshi, Hai and Lushoto (2.1 t/ha).
- Arumeru district had the lowest (1t/ha).
- *Lyamungu 90* had the best in Lushoto (2.1 t/ha).
- Climbing bean varieties recorded higher yields in the input application, with (2.2-3.0 t/ha) in Hai, Moshi and Lushoto.
- Arumeru had the lowest yields (0.8-1.0 t/ha). While *Selian 05* produced highest yield (3.0 t/ha) in Lushoto and Cheupe in other sites (2.2-2.5 t/ha).

BUSH BEAN VARIETIES RESPONSE TO INOCULANT APPLICATION IN NORTHERN TANZANIA

○ Table 4. Summarized results on demonstration of climbing bean and bush bean varieties and their response to fertilizer and inoculant application in Northern Tanzania

Variety	Grain yield (kg/ha)							
	Arumeru		Hai		Lushoto		Moshi	
	With	Without	With	Without	With	Without	With	Without
<i>Lyamungu 90</i>	807.3	687.5	1843.8	1817.7	2156.3	1352.1	1961.6	1596.59
<i>Selian 97</i>	989.6	760.4	1921.9	1875.0	1872.9	1531.3	2056.8	1741.48
<i>JESCA</i>	1062.5	843.8	2161.5	1901.0	1752.1	1477.1	2136.4	1914.77

(a) Bush bean varieties



Plate 5: Demonstration plots in Lushoto



Demonstration plots in Moshi and Hai

BUSH BEAN VARIETIES RESPONSE TO INOCULANT APPLICATION IN NORTHERN TANZANIA

Variety	Grain yield (kg/ha)							
	Arumeru		Hai		Lushoto		Moshi	
	With	Without	With	Without	With	Without	With	Without
Selian 05	1093.8	875.0	2250	1812.5	2377.1	1789.6	2333.3	1572.9
Selian 06	1023.4	843.8	2312.5	2156.25	2245.8	1589.2	2104.3	1885.4
Cheupe	1345.3	881.3	2531.25	2031.25	2218.8	1839.6	3041.7	2333.3

(b) Climbing bean varieties

These results indicate the importance of using the inputs such as fertilizer and inoculants in increasing yield.

FARMERS' PERCEPTION

- Farmers insisted on promotion of high yielding varieties such as Lyamungu 90, in Lushoto.
- They recommended the yellow variety due to high yield.
- They appreciated the use of inputs such as fertilizers and inoculants in bean production.
- They had concerns on the use of stakes mainly due to unavailability in most of the sites.

CONCLUSION

- Due to differences in environmental conditions (rainfall pattern, temperature (altitude), soils disease/pests incidences) these trials had different results.
- This suggests specific bean varieties and inputs to specific sites or districts.
- This study also indicated that sole use of inoculants may not improve the yield, suggesting addition of nutrient inputs to enhance the biological fixation process and ultimately the grain yield



Appendix 5: Presentation by Aida Amalenga

Evaluation of soybean varieties for adaptation and response to inoculation Southern highlands of Tanzania

Aida Magelanga
ARI Uyole

presented at N2Africa Launching meeting 19-20 February 2014
at Landmark Hotel, Dar Es Salaam Tanzania

Background

- Soil fertility and low yielding varieties are the most important constraint to soybean production.
- In SHT, 77% of agricultural soils have very low to low N content.
- Biological nitrogen fixation by soybean is an important option for increasing soil N.

N2Africa Launching meeting held on 19-20 February 2014 at Landmark Hotel, Dar es Salaam Tanzania

Cont...

- ARI-Uyole has released 4 soybean varieties but their response to rhizobia inoculation remain unknown.
- Breeding program in East and Southern Africa have developed and release soybean varieties with good attributes (high yielding, resistant to pest and disease, tolerant to drought, and with quality attributes) which are relevant to Southern Tanzania.
- The project is aimed at evaluating the released and nine introduced varieties for wider adaptability and response to rhizobia inoculation.
- The aim is diversify soybean germplasm in Tanzania to suit different needs.

Report presented during N2Africa Launching meeting held on 19-20 February 2014 at Landmark Hotel, Dar Es Salaam Tanzania

Objectives

- To assess the performance of released and introduced soybean varieties under different agro-ecological conditions of southern highlands of Tanzania
- To determine the response of soybean varieties to rhizobium inoculation in different soils of southern highlands.
- To evaluate the biophysical conditions determining the performance of soybean and response to inoculation.

Report presented during N2Africa Launching meeting held on 19-20 February 2014 at Landmark Hotel, Dar Es Salaam Tanzania

Activities

- Sites selection, field preparation and planting (December, 2013 –January, 2014)

Sites

- Mawengi and Mkiu in Ludewa district
- Uyole, Mbimba and Suluti (experimental sites of ARI Uyole)

Varieties

Variety	Source
Uyole Soya 1, Uyole Soya2, White flower	ARI Uyole
Safari, Spike, Semeke, Squire , Siroko	Seed Co
Namsoy 4M	Makerere University
TGx1904-6F and TGx1740-2F	IITA- Kenya

Report presented during N2Africa Launching meeting held on 19-20 February 2014 at Landmark Hotel, Dar Es Salaam Tanzania



Report presented during N2Africa Launching meeting held on 19-20 February 2014 at Landmark Hotel, Dar Es Salaam Tanzania

Some preliminary observation

- Soybean varieties behave differently when inoculated
 - With inoculation varieties White flower, uyole soy 1 and safari showed more than 90% of emergence
 - Varieties TGx1904-6F, Namsoy 4 emerged well with and without inoculation.Observation continues.

Future activities

- Data collection on phenological stages, nodule assessment, biomass, pest and diseases and yield.
- Produce promotional materials (leaflets, fliers and posters on importance, agronomic package and market systems of soybean).

Challenge

- Some farmers are not aware of the crop and existence of different varieties, soy bean processing and utilization in their families and they lack market information.

Report presented during N2Africa Launching meeting held on 19-20 February 2014 at Landmark Hotel, Dar Es Salaam Tanzania





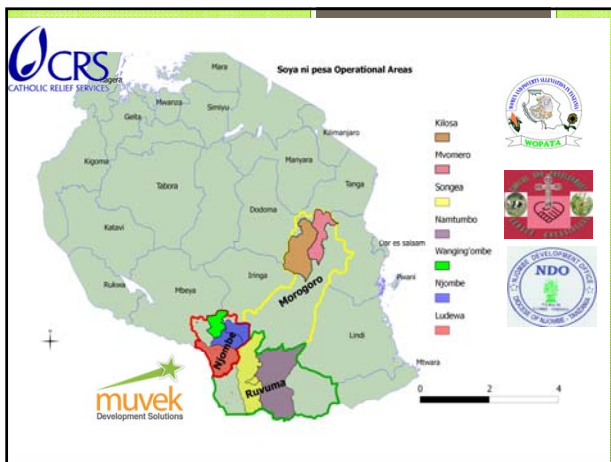
Appendix 6: Presentation by Abubakary Kijoji

Soya ni Pesa (SnP) Project: Achievements & Way Forward 2012/13



Objectives

- Agricultural productivity in the poultry soybean and value chains;
- Expand trade of agricultural products in the poultry and soybean
- Target
 - 11,250 farmers in soybean production
 - 2,500 farmers in poultry production
 - 18,000 households in Savings & Credit activities
- Partners
 - Caritas Songea, Caritas Njombe, WOPATA & MUVEK



Soybean Production



400 farmers were organized, trained and engaged in soybean production. 17 FEOs, 63 CVs and 12 FAs trained on basic agronomic skills.

- 15 demonstration fields and farmers' field days.
- SnP demonstrated best agronomic skills



Marketing and Financial services and Support

- 850 MT of soybean were collectively sold to two buyers.
 - 2,395 farmers benefited.
 - 18 bulking and selling centers established
 - Received \$417,000



Saving and Internal Lending Communities (SILC)

- 33 FAs trained.
- 127 SILC groups formed (2,524 members) in Ruvuma and Njombe.
- Total savings: \$31,000;
- loans disbursed: \$21,000;
- social funds: \$3,100



SILC members in one of their regular meetings

Poultry enterprise development



- Training on poultry husbandry
 - >1000 farmers &
 - > 43 village Executive Officers (VALEOs)
 - > Received vaccine kits



Day-old chicks

Way forward

1. Addressing soybean seeds challenges in the country.
 - > Consultation with stakeholders and lobbying to address this challenge
 - > Consultative seed workshop, June 2013
 - > SnP project launch and stakeholders meeting (Dec 4-5, 2013)
 - > 7 improved varieties are being tested in 75 sites in Ruvuma, Njombe and Morogoro in 2013/14 season

Way forward cont...

2. Linking producers and buyers through:
 - > Facilitating linkages between them
 - > Facilitating access to market information
 - > Facilitating formation of Soya Association
- 3) Strengthen farmer organizations
 - > Organizing and registering PGs
 - > Strengthening PGs (by-laws, records, bank A/C)
 - > Establish market committees / associations
 - > Train PGs in five skills

THANKS





Appendix 7: Presentation by Bernard Vanlauwe

N2Africa Phase II - Putting nitrogen fixation to work for smallholder farmers in Africa

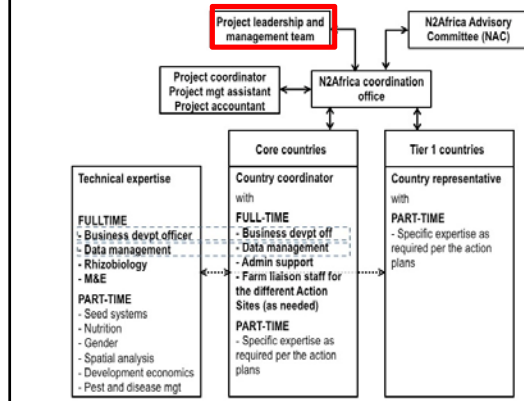


PHASE I:
 → Proof of concept
 → Moving to scale

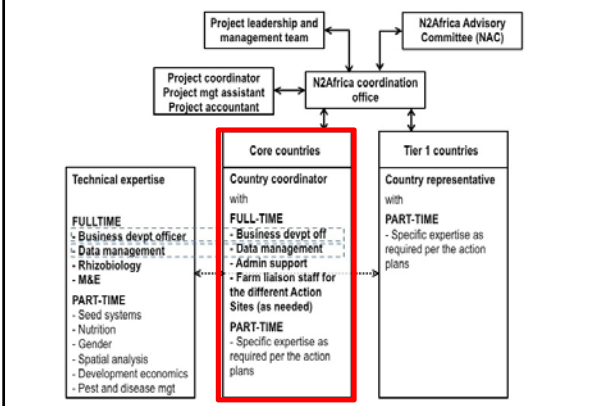
PHASE II:
 → Institutionalization
 → Sustainability

→ Important aspects of the implementation plans

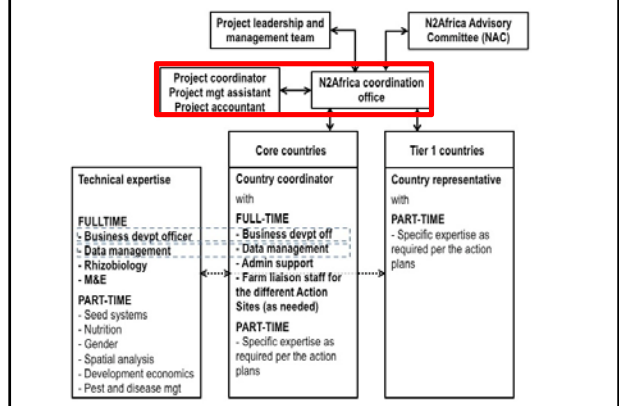
A 'four'-partite → WUR, IITA, ILRI, AGRA



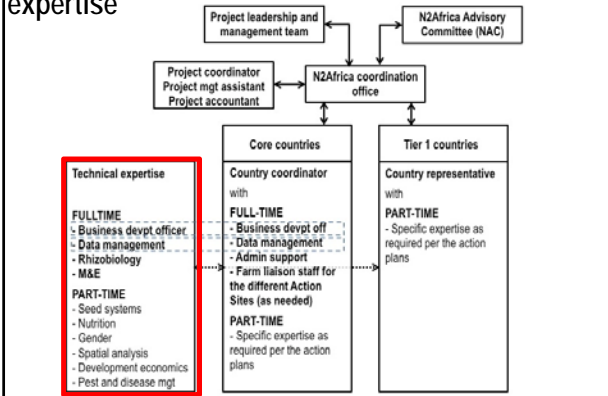
Country teams in a federal model...



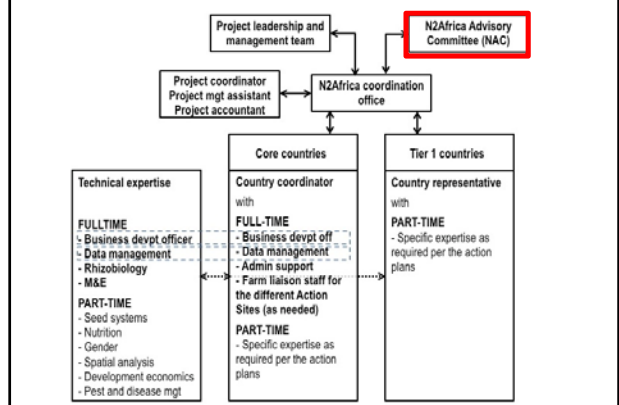
...facilitated by a project coordination office...



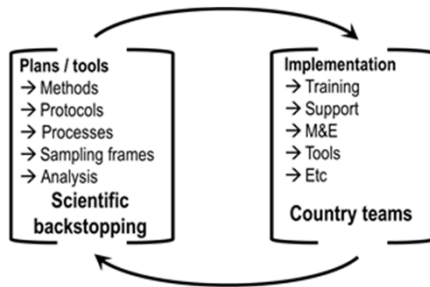
... and backstopped by technical 'state-of-the-art' expertise



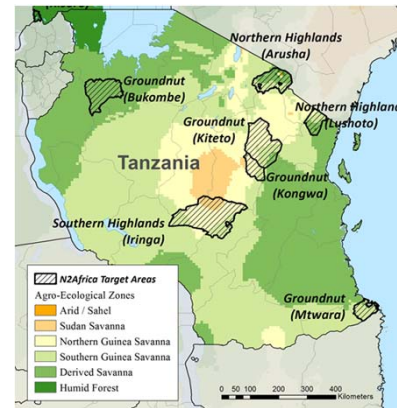
...facilitated by a project coordination office...



... and backstopped by technical 'state-of-the-art' expertise



Priority areas and crops



Results framework: Our contract with BMGF!

A. Results Framework
Please note: Outputs/Outcomes in bold blue are proposed key milestones. Please note that several activities and outputs contribute to a smaller number of Outcomes, such that there is no one-to-one relationship within rows of the table below.

Activities	Outputs	Outcomes
Objective 1: Project strategy, coordination and implementation and capacity strengthening		
1.1. Hire internationally and nationally recruited project staff and procurement of equipments	1.1.1. By Q2 of year 1, all project staff are engaged and the necessary equipment purchased	1.1. Effective and timely work flows and project processes and procedures generate the expected project outputs and ensure effective learning between specific project components
1.2. Set up systems for monitoring and evaluating project progress	1.2.1. By contractual deadlines, relevant technical and financial reports forwarded 1.2.2. By Q4 of year 5, a final project report submitted	1.2. Communication tools and processes generate additional interest in N2Africa activities, translated in extra dissemination, investments, etc.
1.3. Engage research, development, private sector, and other relevant partners in each of the target countries	1.3.1. By Q2 of year 1, potential partners operating with priority legume value chains mapped 1.3.2. By Q2 of year 2, MoUs with priority partners in each of the target countries signed	1.3. Partners along the legume input and output value chains cooperate actively towards achieving the overall N2Africa goals
1.4. Develop and operationalize a project-wide internal and external communication strategy	1.4.1. By Q3 of year 1, an internal and external communication strategy developed 1.4.2. By Q4 of each year, communication products generated, including a continuously updated N2Africa website, regular Podcasters, and social media products 1.4.3. Communication to farming communities will be effected through links to Farm Radio, radio, and other media outlets	1.4. By Q4 of year 5, at least 320 partners trained in N2Africa technologies and approaches

Institutionalization: Partnerships for research

→ Legume agronomy (varieties, inputs, cropping systems, etc) towards intensification of legume production
→ Rhizobiology towards the identification and deployment of effective and competitive rhizobia



Institutionalization: Partnerships for research

- Agronomy 'master plan' for adaptation to Uganda conditions; implementation lead by national system research institutes
- PhD and MSc capacity building
- Research infrastructure
- 1.7 Develop and implement a degree (PhD and MSc)-related research plan
- 4.1 Develop variety x inoculant x nutrient management recommendations for the target legumes and legume production areas based on yield gap analysis
- 4.6 Identify elite rhizobium strains and inoculant formulations for beans, groundnut, and cowpea
- 4.7 Evaluate competitiveness and survival of introduced rhizobium strains as affected by M x E

Sustainability: Partnerships for development

- Validation of most promising technologies at scale → 2.2 Facilitate N2Africa-led dissemination campaigns in the context of development-to-research learning cycles with specific attention to gender
- Understanding variability
- 'Handing over' best technologies to partners → 2.4 Facilitate partner-led dissemination campaigns with specific attention to gender (National Investment Plans, NGOs, etc)
- M&E within dissemination campaigns → 2.3 Create widespread awareness on N2Africa technologies and interventions

Sustainability: Partnerships for development

- Legume seeds
- Inoculant and fertilizer supply
- Outputs (legume value chains)
- Knowledge
- Policy

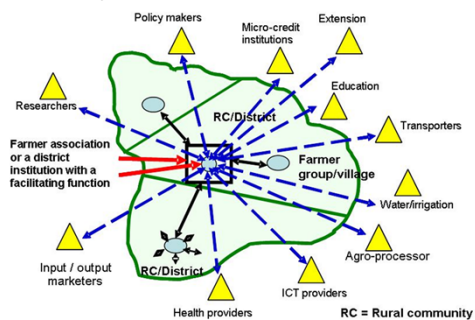
- 1.3 Engage research, development, private sector, and other relevant partners in each of the target countries
- 2.5 Facilitate private-public partnerships towards the sustainable supply of inoculants and fertilizer
- 2.6 Facilitate the establishment of private sector-led and/or community-based legume seed systems
- 2.7 Engage agro-dealer and other last-mile delivery networks in supplying legume agro-inputs
- 2.8 Establish agri-business clusters around marketing and value addition
- 1.8 Develop and implement a non-degree-related capacity strengthening plan for relevant partners working within legume value chains

Sustainability: Women empowerment

- Legumes as a 'women' crop...
... but men like the cash generated by legumes
- Legumes as a source of protein/nutrition

- 3.2 Assess business opportunities for women in agro-input supply and legume marketing and value addition opportunities
- 3.3 Conduct dissemination campaigns targeting women farmers
- 3.4 Develop labor-saving pre- and post-harvest legume tools for female farmers
- 3.6 Develop legume product-enriched food baskets for smallholder families

Sustainability: Partnership platforms



- 2.1 Constitute and facilitate in-country/in-region N2Africa stakeholder platforms

Project planning and M&E

- Formal: Organize seasonal/yearly project-wide and country-specific planning workshops > Roles and responsibilities (yearly)
- Informal: Field visits, meetings with partners
- M&E: 'Learning grant'

- 1.6 Organize seasonal/yearly project-wide and country-specific planning workshops
- 5.1 Develop an innovative framework for strategic M&E, allowing for timely feedback loops
- 5.5 Unravel $G_L \times G_R \times E \times M$ interactions for legume production towards the development of best-fit recommendations
- 5.6 Evaluate the effectiveness and efficiency of various D&D approaches for legume intensification
- 5.7 Conduct impact assessment studies with a specific focus on the sustainability of interventions



Theme	Activity
Platforms	1.3; 2.1
Dissemination	2.2; 2.3; 2.4; 2.5; 2.6; 2.7; 2.8
Gender	3.1; 3.2; 3.3; 3.4; 3.5
Agronomy	4.1; 4.2; 4.3

Activity	Sub-activities year 1	Timing	Who?



Appendix 8: Presentation by Andrew Farrow

Characterisation and stratification of legume producers and production systems

Andrew Farrow
Dar es Salaam, 19th February 2014



Phase 1 Mid-term Review: Key Questions for N2Africa

- | | |
|---|--|
| How to understand best fit without understanding farmer adoption? | Review literature of adoption of legumes in Africa |
| How to embed GxExM within market and institutional context? | Develop a conceptual framework to expand GxExM |
| How to approximate best fit within a scaling out program? | Best fit technologies to best fit approaches |

Conceptual framework for scaling-out N2Africa

$$D_1(G_L) \times D_2(G_R) \times E \times D_3(M) \times SU$$

where

D_1 is the delivery/availability of legume genotypes and other inputs

D_2 is the delivery/availability of strains of rhizobium

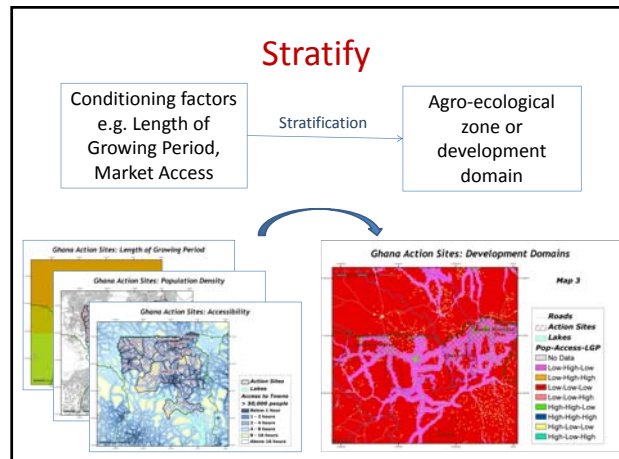
D_3 is the delivery/knowledge of management practices

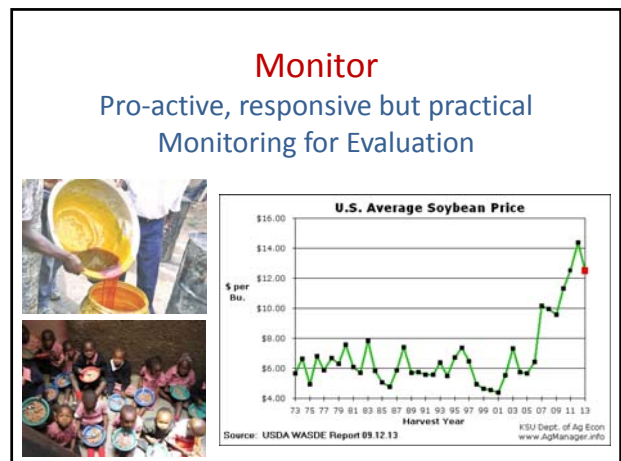
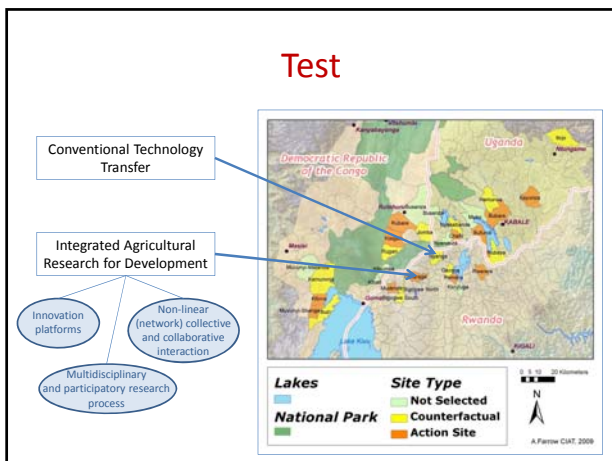
SU is the marketing for sale and utilisation of the legume crop

Conclusions of review of constraints to adoption

- **Stratify** those constraints that cannot be controlled but which will have an effect on the 'fit'
- **Test** different systems, mechanisms, models which can be influenced
- **Monitor** constraints which are dynamic, difficult to predict and therefore difficult to stratify or test

Constraint	Scale / level of constraint	Management of constraint in research design
Biophysical relevance of technology	Multiple	Stratify
Agricultural Research and Development system (including extension)	National, but variations in coverage	Test
Household access to Capital / Assets	Household	Stratify
Availability of (legume) seed	Multiple, but thresholds determined by farmers' time and cost of transport	Pre-requisite / Test
Knowledge about the technology or practice	Multiple	Pre-requisite / Test
Land availability, quality or tenure	Multiple	Stratify
Output market for agricultural (legume) products	Multiple	Pre-requisite / Stratify
Availability of labour	Household and Community	Stratify
Collective action for marketing products, purchasing inputs or experimentation	Household and Community	Test
Alternative technologies or livelihoods that compete with the technology	Multiple	Monitor
Gender	Household and Community level	Stratify
Availability of other (non-seed) inputs	Multiple, but thresholds determined by farmers' time and cost of transport	Pre-requisite / Test
Risk Perceptions	Household and Community	Monitor
Opportunity cost / time lag to benefits	Household	Monitor
Cultural factors	Household and Community level	Monitor
Government support	National, but some local policies may be relevant to adoption	Monitor
Education / literacy of the farm household members	Household and Community	Stratify
Experience of the farm household members	Household	Stratify
Adaptability of technology	Household and Community	Monitor





Characterisation and stratification

- Practical objective
 - Provides a structure of domains for sampling
 - Selecting action sites for implementation and evaluation (e.g. baseline)
- Definition of variables, indicators and spatial units for each strata
 - Biophysical relevance of technology
 - Land availability, quality or tenure
 - Output market for agricultural (legume) products

Tanzania – adoption domains

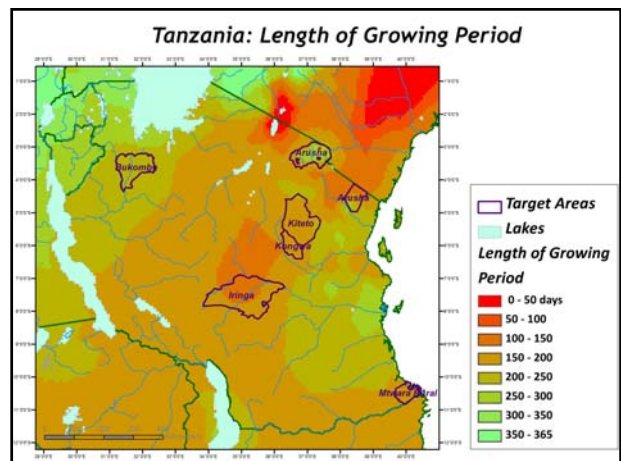
- Biophysical relevance of technology – **low and high potential**
- Land availability, quality or tenure – **low and high population density**
- Output market for agricultural (legume) products – **good and poor physical access to markets**

		High Agricultural Potential	Low Agricultural Potential
Good Market Access	High Population Density	1	2
	Low Population Density	3	4
Poor Market Access	High Population Density	5	6
	Low Population Density	7	8

Tanzania – Target Districts

'Best bet' grain legume crops defined in the bridging grant phase of N2Africa for Target Areas:

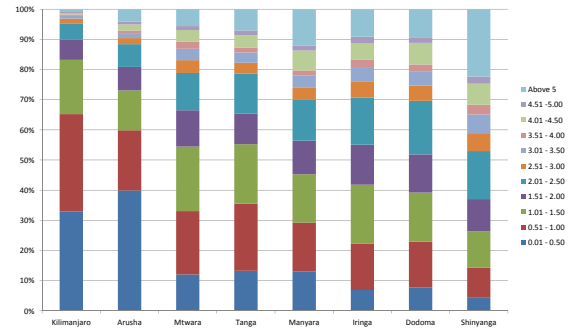
Zone	Target districts	Best bet legume crop
Northern	Arumeru, Hai, and Moshi	Common bean
	Kiteto	Groundnut
Eastern	Lushoto	Common bean
Lake	Bukombe	Groundnut
Central	Kongwa	Groundnut
Southern Highlands	Iringa	Soybean
Southern	Mtwara	Groundnut



Tanzania - LGP

Zone	Target districts	Best bet legume crop	LGP days
Northern	Arumeru, Hai, and Moshi Kiteto	Common bean	195-315 (good)
		Groundnut	165 (poor)
Eastern	Lushoto	Common bean	135-255 (poor/good)
Lake	Bukombe	Groundnut	225 (good)
Central	Kongwa	Groundnut	165 (poor)
Southern Highlands	Iringa	Soybean	135 – 165 (poor)
Southern	Mtwara	Groundnut	195 (good)

Tanzania – Farm Size



Tanzania – Farm Size

Zone	Target districts	Best bet legume crop	Average Farm Size (ha)
Northern	Arumeru, Hai, and Moshi Kiteto	Common bean	0.87 – 1.13
		Groundnut	5.07
Eastern	Lushoto	Common bean	1.06
Lake	Bukombe	Groundnut	4.47
Central	Kongwa	Groundnut	3.93
Southern Highlands	Iringa	Soybean	1.95
Southern	Mtwara	Groundnut	2.29

Tanzania – Access to Markets



Tanzania – Access to Markets

Zone	Target districts	Best bet legume crop	Access to Markets
Northern	Arumeru, Hai, and Moshi Kiteto	Common bean	Good
		Groundnut	Poor
Eastern	Lushoto	Common bean	Poor
Lake	Bukombe	Groundnut	Poor
Central	Kongwa	Groundnut	Good
Southern Highlands	Iringa	Soybean	Good / Poor
Southern	Mtwara	Groundnut	Good

Tanzania – Adoption Domains

		High Agricultural Potential	Low Agricultural Potential
Good Market Access	High Population Density / Small Farm Size	Arumeru, Hai, and Moshi	Iringa
	Low Population Density / Large Farm Size	Mtwara	Kongwa
Poor Market Access	High Population Density / Small Farm Size	Lushoto	Iringa
	Low Population Density / Large Farm Size	Bukombe	Kiteto

Thank you

Characterisation and
stratification of legume
producers and production
systems





List of project reports

1. N2Africa Steering Committee Terms of Reference
2. Policy on advanced training grants
3. Rhizobia Strain Isolation and Characterisation Protocol
4. Detailed country-by-country access plan for P and other agro-minerals
5. Workshop Report: Training of Master Trainers on Legume and Inoculant Technologies (Kisumu Hotel, Kisumu, Kenya-24-28 May 2010)
6. Plans for interaction with the Tropical Legumes II project (TLII) and for seed increase on a country-by-country basis
7. Implementation Plan for collaboration between N2Africa and the Soil Health and Market Access Programs of the Alliance for a Green Revolution in Africa (AGRA) plan
8. General approaches and country specific dissemination plans
9. Selected soyabeans, common beans, cowpeas and groundnuts varieties with proven high BNF potential and sufficient seed availability in target impact zones of N2Africa Project
10. Project launch and workshop report
11. Advancing technical skills in rhizobiology: training report
12. Characterisation of the impact zones and mandate areas in the N2Africa project
13. Production and use of rhizobial inoculants in Africa
18. Adaptive research in N2Africa impact zones: Principles, guidelines and implemented research campaigns
19. Quality assurance (QA) protocols based on African capacities and international existing standards developed
20. Collection and maintenance of elite rhizobial strains
21. MSc and PhD status report
22. Production of seed for local distribution by farming communities engaged in the project
23. A report documenting the involvement of women in at least 50% of all farmer-related activities
24. Participatory development of indicators for monitoring and evaluating progress with project activities and their impact
25. Suitable multi-purpose forage and tree legumes for intensive smallholder meat and dairy industries in East and Central Africa N2Africa mandate areas
26. A revised manual for rhizobium methods and standard protocols available on the project website
27. Update on Inoculant production by cooperating laboratories
28. Legume Seed Acquired for Dissemination in the Project Impact Zones
29. Advanced technical skills in rhizobiology: East and Central African, West African and South African Hub
30. Memoranda of Understanding are formalized with key partners along the legume value chains in the impact zones
31. Existing rhizobiology laboratories upgraded
32. N2Africa Baseline report
33. N2Africa Annual country reports 2011
34. Facilitating large-scale dissemination of Biological Nitrogen Fixation



35. Dissemination tools produced
36. Linking legume farmers to markets
37. The role of AGRA and other partners in the project defined and co-funding/financing options for scale-up of inoculum (banks, AGRA, industry) identified
38. Progress Towards Achieving the Vision of Success of N2Africa
39. Quantifying the impact of the N2Africa project on Biological Nitrogen Fixation
40. Training agro-dealers in accessing, managing and distributing information on inoculant use
41. Opportunities for N2Africa in Ethiopia
42. N2Africa Project Progress Report Month 30
43. Review & Planning meeting Zimbabwe
44. Howard G. Buffett Foundation – N2Africa June 2012 Interim Report
45. Number of Extension Events Organized per Season per Country
46. N2Africa narrative reports Month 30
47. Background information on agronomy, farming systems and ongoing projects on grain legumes in Uganda
48. Opportunities for N2Africa in Tanzania
49. Background information on agronomy, farming systems and ongoing projects on grain legumes in Ethiopia
50. Special Events on the Role of Legumes in Household Nutrition and Value-Added Processing
51. Value chain analyses of grain legumes in N2Africa: Kenya, Rwanda, eastern DRC, Ghana, Nigeria, Mozambique, Malawi and Zimbabwe
52. Background information on agronomy, farming systems and ongoing projects on grain legumes in Tanzania
53. Nutritional benefits of legume consumption at household level in rural sub-Saharan Africa: Literature study
54. N2Africa Project Progress Report Month 42
55. Market Analysis of Inoculant Production and Use
56. Identified soyabean, common bean, cowpea and groundnut varieties with high Biological Nitrogen Fixation potential identified in N2Africa impact zones
57. A N2Africa universal logo representing inoculant quality assurance
58. M&E Workstream report
59. Improving legume inoculants and developing strategic alliances for their advancement
60. Rhizobium collection, testing and the identification of candidate elite strains
61. Evaluation of the progress made towards achieving the Vision of Success in N2Africa
62. Policy recommendation related to inoculant regulation and cross border trade
63. Satellite sites and activities in the impact zones of the N2Africa project
64. Linking communities to legume processing initiatives
65. Special events on the role of legumes in household nutrition and value-added processing
66. Media Events in the N2Africa project
67. Launch N2Africa Phase II – Report Uganda



-
68. Review of conditioning factors and constraints to legume adoption and their management in Phase II of N2Africa
 69. Report on the milestones in the Supplementary N2Africa grant
 70. N2Africa Phase II Launch in Tanzania



Partners involved in the N2Africa project



A2N



Bayero University Kano (BUK)



Caritas Rwanda



Diobass



Eglise Presbyterienne Rwanda



Université Catholique de Bukavu



University of Nairobi MIRCEN



University of Zimbabwe

