



**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.**

Milestone reference number: 4.1.2

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N2Africa

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



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1. Introduction

The plan for collaboration between N2Africa and AGRA programs, specifically the Soil Health Program (SHP) and Market Access Program (MAP) was developed and reported in Milestone Report 1.2.8, submitted in October 2010. Milestone 4.1.2 is more specifically directed towards initiatives N2Africa identifies in collaboration with AGRA programs, along with other institutions/organizations which can help with finance and other means of scaling up inoculant use on legume crops. While not all eight N2Africa countries made significant strides towards this milestone by the time of this report (October 2011), several launched initiatives which, if successful, should enable the project to achieve substantial gains in increasing the use of legume inoculants in the project countries.

2. Kenya

Several co-financing options are under consideration for scale-up of grain legume enterprise and inoculant use in Kenya. One mechanism under study involves AGRA's Kilimo Biashara (Farmer Business) program with Equity Bank. The bank offers short-term loans for farm inputs at 10% annual interest and a \$4 fee. Companies are now offering smallholders both input insurance (against investment costs) and crop insurance (against lost revenue). Either farmers may apply for loans and receive coupons for seed, fertilizer and inoculant redeemable with local input suppliers, or farmers with seed and prepared lands will receive a package of fertilizer and inoculant on credit through their local farmer association. Combining orders for farm inputs can lead to discounts from suppliers that are passed on to individual farmers. After deduction of loan expenses, payment may be made to either bank accounts or via mobile telephone. These and other innovative co-financing options were under consideration for testing during Kenya's short rains growing season (September 2011 to February 2012), however late submission of the loan application to Equity Bank resulted in the loan not coming through. Fortunately, the soybean processing company Promasidor funded the input package with the same terms, and the application procedure to Equity Bank will commence early for the 2012 long rains in Kenya so that the loan will be likely to come through in time.

3. Nigeria

A concept note was prepared which proposes for farmers working with the N2Africa project to be provided short-term credit facilities at affordable rates to enable them purchase inputs to scale-up production and also engage in post-harvest processing and short-term storage to enhance the value of their produce and, hence, their incomes.

The beneficiaries would be N2Africa farmers engaged in legume enterprises. Special consideration would be given to women to enable them purchase inputs, hire storage facilities or hire/purchase farmlands. The loans would be given to enable farmers to scale up their production to between half of a hectare to 3 ha. The credit support facility would be administered to support farm operations, purchase of farm inputs (seeds, fertilizer, inoculants, insecticides and herbicides), support post-harvest processing, community seed production and short-term leasing of storage facilities.

The concept note has been submitted a bank and N2Africa Nigeria is presently waiting to learn whether or not it shall receive favorable consideration.



A private entrepreneur in Nigeria has entered into discussions with N2Africa to establish an inoculum factory in Kaduna Nigeria. (Annex 1)

4. Ghana

New (to the 2011 growing season) partner ACDI/VOCA's ADVANCE project in northern Ghana linked agro-dealers and commercial soybean producers to inoculants imported by N2Africa and sent to SARI for distribution and sale. The inoculants were either sold to the commercial producers or agro-dealers (320 packets of 100 g each), or were distributed free to farmers (200 packets) who were conducting demonstrations. Additional inoculant was imported by N2Africa and sold to the NGO GOAL (850 packets) for use on their own soybean commercial plantings. The interest generated by ADVANCE's/GOAL's promotion of soybean inoculants has resulted in some Ghanaian agro-input suppliers expressing their own interest in importation and sales of inoculants.

Further attempts to identify co-funding/financing options for scaling up of inoculums were made during the 2011 season through market linkages established with Savanna Farmers Marketing Company, Ltd. Although the company was not willing to provide credit for purchase of inputs prior to planting of crops by N2Africa farmers, they believe that in future growing seasons, they can enter into contracts with the farmers, who in turn can use the contracts to access credit from designated rural banks working with Savanna Farmers Marketing Company.

The USAID Feed the Future Project will have a project in the same three Regions in Northern Ghana where N2Africa works. They plan to focus on the three value chains of soybean, rice and maize. The N2Africa project leader participated in the first planning meeting for this project on October 6 and 7. The project has not been prepared yet but it looks like there will be good support for soybean research and the use of inoculum. N2Africa will work in collaboration with Feed the Future. (Annex 2)

5. Mozambique

IKURU S.A.R.L. is a Mozambique owned, agri-trading, processing and exporting company which is partnering with N2Africa in northern Mozambique (indirectly in the 2010/11 and directly in the 2011/12 growing seasons). With guidance from N2Africa's Rhizobiology Specialist, a source of high quality, affordable inoculant in Brazil was identified and, with assistance from the project, IKURU ordered and will be importing this inoculant for sale to TechnoServe (another N2Africa partner), for use on 1800 ha of soybean production in northern Mozambique. Some will be farmers participating in the N2Africa trials which are conducted by TechnoServe, who have the desire and means to purchase inputs for and plant more than 0.5 ha of soybean (standard area for demonstration trials) this coming season.

TechnoServe, which is implementing the Soybean Value Chain Project that is funded by the Bill & Melinda Gates Foundation has had discussions with N2Africa on the steps needed to build and operate an inoculum production plant. They are now seeking expert advice through the N2Africa Steering Committee Member Mariangela Hungria.

6. Malawi

In the first season of project activities in Malawi, soybean inoculants were imported from SPRL-Zimbabwe for use in the demonstration trials, together with MEA's BIOFIX. Some



inoculants was also purchased from the Department of Agriculture Research Service's lab at the Chitedze Agricultural Research Stations. Many of the farmers reported that they were very happy with the performance of the SPRL inoculants, and indicated they would like to use them in the future. Given the proximity of Zimbabwe to Malawi, the SPRL inoculants could find a ready market in the country, should the necessary steps be taken to get these inoculants registered for use in Malawi.

N2Africa in Malawi is helping to expand the market for inoculant imported from MEA in Kenya and in collaboration with an AGRA-funded project, the Clinton Development Initiative (CDI). Following very good results with MEA BIOFIX inoculant during the 2011/12 season, the company applied for registration of BIOFIX in Malawi to allow the inoculant to be imported into the country in the future without each shipment first having to be cleared by the inoculants laboratory at the Ministry of Agriculture's Chitedze Agricultural Research Station. During the intervening period, over which BIOFIX is undergoing trials at Chitedze, no import permits will be granted to MEA for BIOFIX into Malawi, unless a request is issued by IITA or ICRISAT. In order to enable CDI to continue to use BIOFIX, IITA has procured the permit for 1447 kg of the inoculant for CDI and its affiliated farmers to use for soybean production during the 2011/12 season. IITA will continue to assist CDI and other organizations/companies wishing to use BIOFIX with procurement of import permits, therefore expanding the market for inoculant, until the product has achieved registration in Malawi.

7. SIMLESA

N2Africa partnered with SIMLESA to hold a training course in Producing High Quality Inoculum. The course had participants from 1) MEA a private company producing inoculum in Kenya that is distributor in Kenya and Malawi, 2) SPRL a government of Zimbabwe owned and operated inoculum production plant that sells inoculum in Zimbabwe and Mozambique, 3) a private company in Nigeria that plans to build an inoculum production plant in Kaduna, Nigeria for distribution in West Africa 4) two (AGRA funded) participants from the Agricultural Research Service in Zambia and 5) Graduate Student funded by N2Africa studying Rhizobiology from DR Congo and Kenya but based in Kenya. (Annex 3)

8. Challenges and Recommendations

1. Most financial institutions (banks, formal lending facilities) in sub-Saharan Africa are reluctant to finance agricultural activities in general and those targeting small scale farmers in particular. Such farmers, in turn, often lack the financial skills and experience required to understand and adhere to loan-repayment agreements. Provision of inoculants to small scale farmers on credit is likely to be successful and sustainable if there is a limited market for the crop in question, and clear and enforceable guidelines are set in place to ensure the repayment is made. The model employed by Promasidor in western Kenya seems to contain the necessary elements for successful repayment of inputs provided on credit (e.g. the type of soybean the company seeks is different from that sought by the mainstream market which means crops harvested from the seed provided on credit are likely to fetch a higher price with Promasidor than other buyers, a sound grain grading, packaging and collection scheme is in place, etc.¹). Other models tailored to local circumstances should be investigated in the other N2Africa countries.

¹ For details, the reader is referred to the N2Africa Kenya Country Report for Month 18 of the Project.



2. The loan initiative with Equity Bank would most likely have succeeded had the application process started sooner, and perhaps with a smaller number of farmers. Given the complexity of these agreements, together with the factors mentioned above in regards provision of credit to small scale farmers, future ventures should first be piloted on a small scale so as to develop a workable model before scaling up to a larger number of farmers.
3. Collaboration between N2Africa institutions and private sector entities can be used in different ways to enhance availability and use of inoculants. After MEA in Kenya identified a viable market for its inoculants in southern Africa, it solicited the assistance of N2Africa's implementing institution in Malawi (IITA) to ensure that its product BIOFIX could continue to be imported into the country during the three-year trials required for product registration. This will help to ensure that the market for BIOFIX is not only maintained during the intervening period but expanded.
4. N2Africa is more likely to succeed in identifying co-financing/funding for scaling up of inoculants if the project partners with other organizations are involved in linking farmers with input markets and credit (e.g. ACIDI/VOCA, Promasidor/Smart Logistics). In so doing, we can build upon the experience and achievements of others to make progress towards this goal, rather than trying to create the necessary structures and linkages from scratch.



Annex 1: Inoculant production plan for Nigeria

Background

The N2Africa project was launched in 2010 as a new initiative in which legumes are used as a basis for diversification of cropping systems, improving soil fertility and improving farmer incomes in smallholder farming systems in sub-Saharan Africa. In Nigeria, the project is operational in Kaduna and Kano States, which have a combined population of about 16,377,258 million and a total crop area of about 3,392,126 ha. The project will over a four-year period target over 37,000 farm households working with cowpea, groundnut, and soybean (Table 1).

Table 1. Dissemination targets for different crops in Nigeria

Target	Cowpea	Groundnut	Soybean	Total
2010	830	830	840	2,500
2011	2,500	2,500	5,000	10,000
2012	6,250	6,250	12,500	25,000
Total	9,580	9,580	18,340	37,500

The project aims to increase productivity of smallholder farms through enhanced input from biological nitrogen fixation (BNF). One of the approaches to be employed is the application of rhizobial inoculant technologies to improve BNF. During the lifespan of the project, it is expected that average yield increases due to inoculation will be about 30% although it is not in all cases that inoculation will be necessary. Dissemination activities will be continuously backstopped by adaptive research through the isolation and selection of elite rhizobial strains and channeling these towards improving rhizobial inoculants in terms of strain persistence, fermentation methods, carriers, delivery methods, handling procedures and shelf life.

Inoculation practice is virtually non-existent in Nigeria. Therefore, the pathway for inoculant technology transfer and inoculant industry development in this region will require an innovative multi-stage approach that clearly demonstrates the benefit of inoculation, creates a demand amongst farmers for inoculants, develops an agro-dealer network for the product, and facilitates private sector investment in the manufacture and sale of high quality inoculants at affordable prices to farmers.



Annex 2: USAID Planning Meeting, 6-7 October 2011, ICRISAT Regional Office, Samanko

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Jerry Glover USAID, jglover@usaid.gov

Background: Central objectives of the Feed the Future research strategy include the identification and development of key African farming systems in three regions: 1) the West Africa Sudano-Sahelian zone; 2) the Ethiopian Highlands; and 3) the East and South Africa mixed-maize region. These regions were chosen after analysis of cropping systems, poverty, population, and probability of success. The development of these regions will be based around research in best management practices for sustainable intensification. This will require well-coordinated efforts involving multiple donors, regional organizations, partner universities, the private sector, national and international agricultural research institutes, and NGOs. USAID is looking to CGIAR centers to play a central role in designing and managing the regional research projects supporting these objectives and as a way of bringing a regional focus to the Systems CRPs (1.1 - 1.2). The regional research will also provide a foundation for scaling up technologies through broad partnerships and links to country-based Feed the Future programs.

Purpose: These October 2011 regional planning meetings will bring together representatives of CGIAR centers conducting critical research in each of the three regions to discuss and begin to identify important production constraints, researchable topics, and partners. While we envision a broad set of partners participating at later stages, in this initial stage we need to limit the numbers so we can get things started quickly. These discussions will provide the basis for the development of concept notes in which regional research and development project plans and objectives are more fully described. We are asking planning meeting participants to also develop preliminary schedules and agendas for follow-up regional project workshops. Our preferred timing for the project workshops would be in January and February 2012 involving other relevant partners.

Meeting outcomes:

- Identification of research priorities
- Development of concept note(s)
- Plan for project workshops and full design
- Timeline for design and implementation

Proposed regional design workshops:

Jan 9 – 12 : West Africa Sudano-Sahelian zone, Tamale, Ghana
Jan 30 – Feb 2 : Ethiopian Highlands, Addis Ababa, Ethiopia
Feb 6 – 9 : Eastern & Southern Africa maize-mixed region, Dar es Salaam, Tanzania

Meeting Agenda

Thursday 6 October

0900 – 0930 **Introductions**

0930 – 1030	Feed the Future Initiative's research strategy Key Themes: • <i>Productivity</i> • <i>Nutrition/Food safety</i> • <i>Sustainable intensification of key farming systems—South Asia, Sudano-Sahelian zone, Ethiopian Highlands, eastern & southern Africa maize-mixed systems</i>	Rob Bertram USAID
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• Country-led



- Cross-cutting issues: climate change, gender, environment
- SI research complements USAID country missions' focus on specific value chains
- Alignment & Partnerships: USAID investments (CRSPs, CG), donors, NGOs, CAADP, sub-regional & regional organizations

Given the challenging conditions faced by Africa's farmers, it is problematic to attempt to sustainably intensify farming systems while focusing on only one or a few value chains. With a changing climate, risk reduction is as important as increased productivity. *Efforts to improve a single or a few value chains in a specific region should be complemented by more holistic, integrated research strategies to improve overall farming system performance in terms of environmental, economic, yield, and nutritional considerations.* Research results should also have wide relevance to other African farming systems.

1030 – 1045

Break

1045 – 1230

Part I: The CRPs and regional farming systems: geography, characteristics & issues

ICRAF will review CRP1.1

The CRPs are the result of much effort and critical analyses. USAID, with limited research resources, is focusing centrally funded investments on key farming systems. Each USAID country mission is focusing research investments on a few value chains. The approaches to improving agricultural productivity outlined in the Integrated Systems CRPs provide opportunities for USAID's centrally funded, integrated-systems research to complement the value chain research focus supported by USAID missions.

IITA will review CRP1.2

Others on CRPs

Several analyses have characterized the major farming systems of the region. These include root crop, cereal-root crop mixed, and agro-pastoralist millet/sorghum systems. USAID will also be focusing on irrigated and/or upland rice production systems. Some conditions in the region may have changed that limit or expand production opportunities, including changes to: markets, infrastructure, governance, soil health, climate change, etc.

Discussion topics:

- Updates on specific plans for CRP 1s' research implementation in the region.
- Which components of the CRPs are most relevant to production systems in West Africa (with a particular emphasis on northern Ghana)?
- Are there specific researchable issues, the significance of which spans the SS zone?
- Issues that might have significant impacts in regions other than West Africa?
- What are the tradeoffs between risk reduction & resilience offered by more complex systems and the potential benefits (e.g., labor savings) of simplified systems (e.g., maize-soy rotations)?
- Who are the farmers and what do they want?
- What is working, what is not working, what might work better?



	<ul style="list-style-type: none"> • What are the key constraints? • What is the role of mechanization, irrigation? 	
1230 – 1330	Lunch	
1330 – 1430	Part II: The CRPs and regional farming systems: geography, characteristics & issues	all
1430 – 1445	Break	
1445 – 1600	Mapping of research in the region <ul style="list-style-type: none"> • CG centers • NGOs • Other donors • National research institutes 	all
1600 – 1700	Discussion of potential research themes and priorities <ul style="list-style-type: none"> • What can be accomplished with USAID's central research funds allocated for the region? • Which research issues might increase buy-in from other missions and donors? • How will research supporting the needs of small holder farmers support large scale producers and conversely? • Are there key researchable issues that span the Sudano-Sahelian zone; key production constraints common from the southern sudan zone up through the sahel; east into South Sudan? • What is transferrable from other regions? • Where are potential research centers for the region? • Are there research outcomes that could be transferrable to the Horn of Africa? • Components: maize, rice, sorghum, millet legumes, agroforestry, livestock, aquaculture, horticulture, other? 	all



Friday 7 October

0900 – 1030	Discussion of potential research themes and priorities (continued)	all
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1030 – 1045	Break	
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1045 – 1300	Discussion of January workshop	all
	<ul style="list-style-type: none"> • Dates & locations (Ghana) • Length (4 days w/ 2 days large group & 2 days smaller focused group?) • identify key partners • Concept paper(s) • Agenda outline 	

1300 – 1400	Lunch	
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1400 – 1500	Identify roles & timeline	all
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1500 – 1530	Review & summary	
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Annex3: Legume Inoculant Technology and Quality-Control Procedures Workshop

Dr. Anabel Vivas-Marfisi (Centre for *Rhizobium* Studies, Murdoch University, Perth, Australia)

A workshop on Legume Inoculant Technology and Quality Control (QC) procedures was held at the Microbial Resources Centre Laboratory (MIRCEN) in the Department of Land Resource Management and Agricultural Technology (L.A.R.M.A.T.), University of Nairobi (UoN; Kabete Campus) from July 4th to 22nd, 2011. The training was co-funded by the N2Africa Project and SIMLESA (Sustainable Intensification of Maize-Legume Cropping Systems for Food Security in Eastern and Southern Africa) with the focus to provide participants with the latest ideas and techniques in manufacturing *Rhizobium* inoculants and in QC testing procedures required in achieving high quality legume inoculants.



Thirteen attendees comprising of specialists coming from some of N2Africa partners (Ethiopia, Kenya, Malawi, Nigeria, Zambia and Zimbabwe), University of Nairobi Students and MIRCEN Laboratory technical staff, participated at this workshop. Its structure was a

practical and hands-on experience where they learnt to deal with rhizobia cultures, recognize contaminants, maintain rhizobia Mother Cultures, produce batch fermentation cultures, inject inoculant bags and perform QC tests. Participants also had the opportunity to learn serological techniques (Precipitation & Agglutination and the ELISA test) frequently used in the identification of rhizobia species. This was demonstrated by Chief Technologist Nduhiu Gitahi (MSc Immunology) from the Department of Public Health Pharmacology & Toxicology, UoN.



The workshop provided all attendees with new skills that they in turn will be able to share and use in their workplace. It was also an excellent opportunity to interchange information between participants and trainers and to develop and foster new relationships and networks with the ultimate aim of improving the production of legume inoculants in Africa.



Workshop participants (from top left): Victor Mukwa (Zambia), Priscah Echessa (MEA Limited-Kenya), Demola Akanni (Nigeria), James Ndiritu (MIRCEN Technologist), Dr Kenton Dashiell (N2AFRICA Project Leader; CIAT-TSBF), Nabintu Ndusha (UoN Student), Alfred Rumongi Tabaro (UoN Student), Amanuel Asrat (Ethiopia), Maureen Waswa (UoN Student), Dr Anabel Vivas-Marfisi (Australia), Cathrine Mushangwe (Zimbabwe), Prudence Mapiki (Zambia), Professor Nancy Karanja (UoN) and Lloyd Liwimbi (Malawi).



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 soybeans, 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



Partners involved in the N2Africa project



Caritas Rwanda



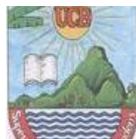
Diobass



Eglise Presbyterienne Rwanda



Resource Projects-Kenya



Université Catholique de Bukavu



University of Zimbabwe

