



## **General approaches and country specific dissemination plans**

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## **N2Africa**

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



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# 1. General Approaches and Country-specific Dissemination plans

## Background

Dissemination actions are covered within the N2Africa Project under Objective 4 and have five component activities as described on page 29 of the project document as follows:

### 1.1. Objective 4: Deliver legume and inoculant technologies to farmers throughout sub-Saharan Africa

- 4.1. Create strategic alliances for facilitating dissemination of legume and inoculant technologies in the impact zones.
- 4.2. Produce specific dissemination tools, including inoculant packets, adapted to the needs of farmer groups, agro-dealers, and development partners.
- 4.3. Engage with other legume seed production and marketing activities, farm input, commodity marketing and processing initiatives, and household and children's nutrition programs operating throughout the impact zones.
- 4.4. Conduct collaborative legume and inoculant technology dissemination campaigns and create awareness in rural communities in all impact zones.
- 4.5. Develop strategies for empowering women to benefit from the project products.

The project will work with 225,000 farm households in eight countries and three African sub-regions over four years. These households are reached in a graduated manner with 4000 in Year 1, 14,000 in Year 2, 42,000 in Year 3 and 165,000 in Year 4, with 75,000 in each of three sub-regional "hubs" (see Table 1). In the East and Central African sub-humid midlands and highlands, it will operate in west Kenya, Rwanda and east DR Congo. The onset of rains is early in this hub (February and March), so deployment of the first year's outreach materials occurred prior to the preparation of this report. In Southern Africa, the project operates in Malawi, Mozambique and Zimbabwe although because of its monomodal seasonal rains beginning late in the year (November) outreach activities of years 1 and 2 are combined. In the West African savanna, it operates in the northern Guinea savannas of Ghana and Nigeria. The targets for each of the countries presented in Table 1 are presented as a guide and in a more recent review of these numbers (Appendix D July 2009) the total number of households targeted was Malawi 30,000, Zimbabwe 30,000 and Mozambique 15,000. The funds available for materials to work with each household are \$7, \$6, \$5 and \$4 during years 1, 2, 3 and 4, respectively. This includes the cost of developing dissemination tools (Activity 4.2) and local community demonstrations (Activity 4.4). These activities target both women and men but to ensure the full participation of women there is a separate budget for the empowerment of women participants (Activity 4.5).

**Table 1: Outreach targets for different hubs and countries over the project lifetime**

Sub region Country	Year				Total
	1	2	3	4	
	----- number of empowered households -----				
<b>East &amp; Central Africa</b>	<b>2000</b>	<b>4000</b>	<b>14000</b>	<b>55000</b>	<b>75000</b>
Kenya	1000	2000	7000	27500	37500
DR Congo	500	1000	3500	13750	18750
Rwanda	500	1000	3500	13750	18750
<b>Southern Africa</b>	<b>0</b>	<b>6000</b>	<b>14000</b>	<b>55000</b>	<b>75000</b>
Malawi	0	3000	7000	27500	37500*
Mozambique	0	1500	3500	13750	18750*
Zimbabwe	0	1500	3500	13750	18750*
<b>West Africa</b>	<b>2000</b>	<b>4000</b>	<b>14000</b>	<b>55000</b>	<b>75000</b>
Ghana	1000	2000	7000	27500	37500
Nigeria	1000	2000	7000	27500	37500
<b>Total</b>	<b>4000</b>	<b>14000</b>	<b>42000</b>	<b>165000</b>	<b>225000</b>

\*Appendix D 2009 figures are Malawi 30,000, Zimbabwe 30,000 and Mozambique 15,000



## 1.2. Objectives, outputs and milestones

The five component Activities are realized through a series of milestone tasks, each to be realized within a target time frame (Table 2), with seven of these either scheduled for completion during Year 1 or recurrent (Activity 4.4 and Task 4.5.3). The first milestone of Year 1 (4.1.1) involves administrative agreements that will not be considered within this report. To a large extent, Activity 4.2, which involves the development of dissemination tools, is perhaps scheduled too late (Month 6, Years 2 & 3) as these tools are necessary for the dissemination campaigns of Year 1. Cooperators developing field work during Year 1 should recognize that they are employing prototype dissemination tools that must be refined and reported the following year. Task 4.3.1 involves the acquisition of improved legume seed varieties and care must be taken to incorporate multiplication of these seeds into the dissemination campaigns. Task 4.5.3 involves two special events within the national extension campaigns that relate to the empowerment of women as stakeholders, events that will be conducted every year of the project.

## 1.3. General approaches to extension activities

**Entry point.** To be most understandable to farmers, the project should focus upon promoting legume production and grain legume enterprise. This approach does not preclude explanations of nodulation, biological nitrogen fixation and inoculant use, but rather places them in line with household objectives.

**Target technologies.** This project coincides with the development and emerging availability of several improved grain legume varieties including promiscuously nodulating soyabean, disease resistant groundnuts, prolific climbing bean and higher yielding cowpeas (see **Plans for interaction with the Tropical Legumes II project (TLII) and for seed increase on a country-by-country basis**). In some cases, these grain legumes respond to inoculation with rhizobia and, as evidence for these benefits emerges from agronomic and microbial field research activities, they must be considered within dissemination activities. These seed technologies are best incorporated within packages where adhesive, rhizobial inoculant, and possibly lime or phosphate coating are combined in effective, innovative manner. A progressive (sequential) list of dissemination tools includes:

- Distribution of a grain legume production and rhizobial inoculation extension bulletins developed with each country (or hub) and distributed by national cooperators. These information campaigns may be backstopped by the production and broadcast of radio and video shows, and by popularizing BNF and grain legume enterprise in newspapers and agricultural trade journals.
- Publication and distribution of manuals on extension method that would be used by the project.
- Free distribution of a small grain legume “starter kit” consisting of improved seed, phosphorus and where beneficial, inoculants and adhesives. This action is best conducted during years 1 and 2.
- Initiating community-based seed production in Years 1 and 2 that provides the much larger quantities of seed required for the scaling-up during Years 3 and 4 (see Table 1). Incentives for initiating community-based seed production may be offered by providing P fertilizer to cooperators agreeing to produce seed for their members or assuring that inoculants will continue to be offered free-of-charge the following season.
- Promotion of a cost effective, more advanced “production package” where farmers invest in locally proven grain legume production enterprises designed by the findings of the agronomic and microbiology activities, and that includes the best legume varieties, proven adhesives, strains and seed coating technologies and needed fertilizer. These packages or components of them are best extended on credit through farmer associations or marketed by local stockists. Further improving rhizobial inoculants in terms of strain persistence, carriers, handling procedures and shelf life and promoting these breakthroughs as an inoculant retailers “sales kit” so that needed inoculants are sold at the time and place of legume seed purchase. Care will be taken to ensure that extension clients participating early in the project are not bypassed by improved technologies developed toward its end.





**Table 2: Activities, milestones and time frame for N2Africa Technology Dissemination (Project Objective 4)**

ID No	Activity/Milestone	Target
<b>Objective 4</b>	<b>Deliver legume and inoculant technologies to farmers throughout sub-Saharan Africa</b>	
Activity 1	Create strategic alliances for facilitating dissemination of legume and inoculant technologies in the impact zones	
4.1.1	Memoranda of Understanding are formalized with key partners along the legume value chains in the impact zones	month 6 year 1
4.1.2	Co-funding/financing options for scale-up of inoculant through banks, AGRA and industry are identified	month 6 year 2
4.1.3	At least 10 additional satellite sites have been identified per impact zone	month 12 year 3
Activity 2	Produce specific dissemination tools, including inoculant packets, adapted to the needs of farmer groups, agro-dealers, and development partners	
4.2.1	At least 1 dissemination tool for each action site related to legume and inoculant use is produced per impact zone, resulting in about 24 different tools by the middle of year 3	month 6 years 2&3
Activity 3	Engage with legume seed system, market, and nutrition initiatives operating in the impact zones	
4.3.1	Sufficient [several tons] legume seed is acquired through cooperation with TL-II and the private sector, for initial dissemination in the various impact zones	month 6 year 1
4.3.2	At least half of the farming communities engaged in the project are actively producing legume seed for local distribution	month 6, year 2
4.3.3	At least half of the farming communities engaged in the project are actively linked to legume market outlets	month 12 year 2
4.3.4	At least half of the farming communities engaged in the project are linked to legume processing initiatives	month 12 year 3
Activity 4	Conduct collaborative legume and inoculant technology dissemination campaigns and create awareness in rural communities in all impact zones	
4.4.1	Dissemination and extension process and proof of principle in pilot site testing documented.	month 10 year 1
4.4.2	Large-scale demonstration and dissemination campaigns held in each impact zone	month 6 all years
4.4.3	At least 3 extension events (e.g., field days, exchange visits) organized per season per country	month 9 all years
4.4.4	At least 3 mass media events (e.g., radio programs, video documentaries) organized per hub	month 12 all years
Activity 5	Develop strategies for empowering women to benefit from the project products	
4.5.1	Gender analysis in relation to specific legumes, labor, household and market preferences documented.	month 6 year 2
4.5.2	A report documenting the involvement of women in at least 50% of all farmer-related activities produced	month 9 years 2,3&4
4.5.3	At least 2 special events on the role of legumes in household nutrition and value-added processing conducted per country	month 12 all years

**Working with farmers:** Farm households are best engaged through their pre-existent local membership organizations in conjunction with agricultural extension support. It is best to work with registered farmer associations that have established bylaws and elected officers, as these groups can readily incorporate project extension activities into ongoing operations in a cost effective manner. In contrast, rural development organizations and agricultural extension officers may regard participation in N2Africa as an “income generating” activity and be unwilling to install demonstrations and distribute inputs without charge. This extension may be provided through national agencies or rural



development NGOs. It is important that farmer groups not be contrived by project planners, but rather solid registered organizations with elected officers, regular meetings and active women and youth chapters. In most countries there are national or more localized farmers associations ready to work with the project. In the same manner, where agricultural extension support is strong and interested in developing grain legume enterprise within the smallholder farming sector, they must become engaged in project activities and will doubtless benefit from collaboration, but where extension is scarce or lax, the project lacks resources to reform them. In all countries, international and national NGOs with experience in the promotion of farm technologies are in place, and are participating in the national project planning meetings.

The strategy for full farmer engagement will either be tightly focused or broad depending upon the number of candidate farmer groups available immediately, keeping in mind that each country is expected to work with 500 to 1000 farmers in Year 1 increasing to 13,750 to 27,500 in Year 4. There are two broad options for farmer groups participation, either selecting new groups each year in and around new locations within action sites or identifying several, larger organizations in Year 1 across the entire action site and increasing the number of farmers within each organization over time. Where farmer groups are well developed, the broader strategy will be preferred as it provides greater opportunity and time for peer pressure mechanisms, farmer-to-farmer dissemination and the establishment of accompanying actions (e.g. input supply, legume marketing, processing). In most cases, increased engagement will likely be a combination of both approaches, with the strongest dissemination partners brought onboard first. Two additional points must be considered. Activity 4.1.1 concerns strategic alliances. As dissemination actions were most imminent in East and Central Africa with rains in February 2010, alliances were first developed in this region, including seed and inoculant supply. In Southern and West Africa rains started later and more time was available for planning (MoUs and such). Activity 4.1.2 covers co-funding by development partners, with a strategy expected after 18 months. While it is advantageous to look for buy-ins from international NGOs and large businesses, we will not expect farmer's groups to provide more than land, labor and willing participation in credit and marketing actions.

**Table 3: Parameters necessary to calculate input needs for an extension campaign in legume BNF technology and their preliminary values for Western Kenya.**

parameter	unit	----- legume -----				
		soybean	bush bean	climbing bean	groundnut	cowpea
seed size	seed/kg	7300	2100	2020	2000	10000
target dose	rhizobia/seed x 10 <sup>3</sup>	1000	2000	2000	3000	1000
inoculant quality	rhizobia/g x 10 <sup>6</sup>	500	500	500	500	500
row spacing	m	0.33	0.5	0.75	0.5	0.33
in-row spacing	m	0.1	0.2	0.2	0.25	0.2
legume stand	plants/ha	303030	100000	66667	80000	151515
adhesive rate	ml/kg seed	20	18	18	16	25
gum arabic rate	g/ml	0.40	0.40	0.40	0.40	0.40
mineral coating	kg/kg seed	0.2	0.1	0.1	0.08	0.3

#### 1.4. Designing an extension campaign

Cooperators in each country are expected to address all of the milestones presented in Table 2, including the design of specific dissemination tools and their popularization through national extension campaigns. While the selection of partners within these campaigns is specific to each country, some common principles exist in terms of the components of dissemination tools and their scaling within extension activities. National extension planners must not only identify promising new legume varieties (through Objective 2 actions) and sources of rhizobial inoculant (through Objective 3





actions), but specific parameters concerning the management of those legumes and inoculants in order to cost and assemble necessary materials. These parameters include seed size, target inoculant dose, inoculant quality, row and inter-row plant spacing and resulting legume stand, the requirement for adhesives and their dilution, and the need for mineral seed coating and fertilizers. Suggested values of these parameters for four grain legumes in Western Kenya appear in Table 3, but represent a starting value only and must be refined by each national team. Note that smaller seeds require more adhesives and can accommodate more inoculants and mineral coating materials because they have a greater ratio of surface area to mass. Also, there are no plans to use inoculants on cowpea or groundnut in the extension campaign at this time. Information on inoculants for cowpea and groundnut are presented in Tables 3, 4 and 5 in case new research identifies inoculant technologies that increase yield or BNF in cowpea or groundnut.

These basic information concerning legume seed, inoculants and their management (Table 3) may then be used to calculate the input requirements of establishing sound grain legume enterprise per ha (Table 4). Note that soybean planted at the density and inoculated under the conditions specified within Table 4 requires 42 kg seed, six 100-g packets of inoculant, 0.9 liters of adhesive solution containing 0.33 kg of gum arabic, 8 kg of seed coating and may be fertilized with two 50-kg bags of fertilizer per ha. In contrast, climbing bean requires 33 kg seed, three 100-g packets of inoculant, and 0.6 l of adhesive containing 0.25 kg of gum arabic and can accommodate 3.3 kg of mineral coating. These differences between input requirements range between 20% (for seed) and 60% (for mineral seed coating) and are largely the result of differences in climbing beans larger seed size and lower planting density.

**Table 4: Inputs necessary to establish one ha of BNF technologies for five grain legumes based upon information available in Western Kenya.**

input	unit	legume				
		soybean	bush bean	climbing bean	groundnut	cowpea
crop seed	kg/ha	42	48	33	40	15
rhizobial inoculant	g/ha	606	400	267	480	303
adhesive solution	ml/ha	830	857	594	640	379
gum arabic	g/ha	332	343	238	256	152
mineral coating	kg/ha	8.3	4.8	3.3	3.2	4.5
P fertilizer	kg/ha	100	100	100	100	100

Input requirements for different grain legume enterprises may then be employed to calculate the quantities required for a particular field campaign and their cost. Table 5 presents the inputs required to introduce legume and BNF technologies to 200 m<sup>2</sup> field plots on 1000 farms. Note that different amounts of seed, inoculant, adhesives and mineral coating are required for each legume, and that seed requirements differ as much as three-fold between cowpea and bush bean. Needed rhizobial inoculants and adhesives also vary by two-fold or more (cowpea vs bush bean). Costs per household also vary by as much as 40% with \$3 per household introduced to improved cowpea cultivation and \$5 per household introduced to climbing beans (Table 5). These differences obviously have major implications on the design and logistics of national extension campaigns, particularly concerning the acquisition, packaging and distribution of farm inputs. Note that the number of target households per country and project year are set within the project (Table 1), as are the funds available for inputs per participating household (\$5 to \$7, decreasing with time) and the mandated legumes within each sub-region. These conditions permit cooperators to prepare and cost more detailed, country-specific extension plans. Furthermore, cooperators may adjust the coverage of various farm input dissemination tools to the costs of each legume enterprise (e.g. larger on-farm field tests with cowpea, smaller ones with climbing bean).



**Table 5: Resources necessary to introduce BNF technology to 1000 households on 200 m2 per household**

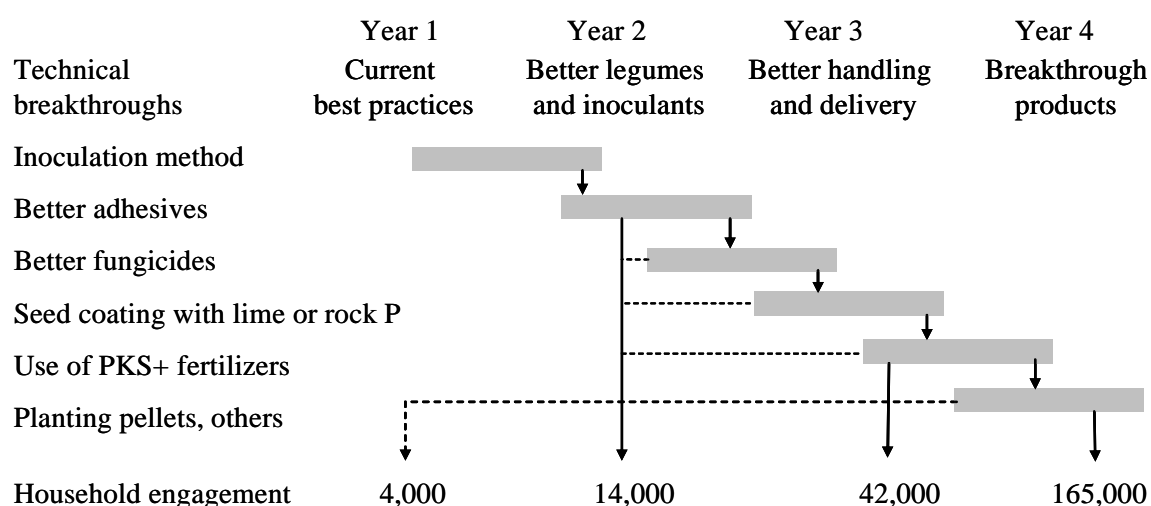
input	unit	legume				
		soybean	bush bean	climbing bean	groundnut	cowpea
crop seed	kg	830	952	660	800	303
rhizobial inoculant	kg	12	8	5	10	6
adhesive solution	litre	17	17	12	13	8
gum arabic	kg	7	7	5	5	3
mineral coating	kg	166	95	66	64	91
P fertilizer	kg	2000	2000	2000	2000	2000
total input cost <sup>1</sup>	\$	3882	3899	4936	3661	3010
cost per farmer	\$	3.88	3.90	4.94	3.66	3.01

<sup>1</sup> Costs estimated as \$1.20 per kg seed, \$12 per kg inoculant, \$0.50 per liter solution and container, \$20 per kg gum arabic, \$1.20 per kg mineral coating and P fertilizer. Costs of climbing beans also include 200 stakes at \$0.15 each.

### 1.5. Advancing current practice and technical breakthroughs

Extension activities in BNF and grain legume enterprises are intended to begin with current best management practices in Year 1 that are refined over the next three years based upon findings from research in legume agronomy and rhizobiology. These refinements include the distribution of improved legume varieties and better inoculants (Year 2), better handling and application of more and more effective inoculant rhizobia (Year 3) and the design, mass production and commercial distribution of less expensive and more profitable farm inputs (Year 4). This sequence is presented in Figure 1. For field legumes that respond strongly to inoculation with rhizobia, the following sequence of technical advance, and their promotion through extension activities is likely.

- Inoculation method.** Currently the two-step method of seed inoculation is recommended where first an adhesive is applied to a bag of seeds, shaken to cover and then a powdered rhizobial inoculant added, the bag is shaken again and then the seeds are planted. Once inoculated onto seeds, rhizobia are extremely vulnerable to the effects of light, high temperature and low humidity, so the seeds must be planted as soon as possible following inoculation. Project microbiologists should identify a recommended best practice inoculation method during the first year of the project. In later years, improved techniques of inoculation will be advanced by project scientists and incorporated into extension activities.



**Figure 1: Project extension activities begin with current best practices and then popularize a series of technical breakthroughs related to seed coating, inoculation and crop fertilization. Earlier extension clients must not be bypassed by later technical advances**



2. **Better adhesives.** The more elite rhizobia applied to seed, the greater their effect, and adhesives are one means to increase the inoculant dose. Available adhesives include water, 10% sugar, powdered milk, honey or syrup solutions, 4% methyl ethyl cellulose and 15-40% gum arabic. In many cases, sugar, water and honey solutions perform no better than water. Gum arabic, which is produced by the African indigenous tree *Acacia senegal*, not only binds more rhizobia to seeds but protects them prior to planting and is presently considered the preferred adhesive. Project microbiologists should identify and recommend improved seed adhesives during the second year of the project.
3. **Better fungicides.** Seed dressing with fungicides and insecticides is often necessary for successful germination and development of healthy legume seedlings. Most fungicides are antagonistic to rhizobia, with those containing heavy metals considered extremely toxic. One fungicide with reduced toxicity to rhizobia is thiram (Tetramethyl-thiuran-disulphide) and treatment with this fungicide should be considered the current best management practice. Project microbiologists are expected to advance recommendations on pesticide treatment of inoculated seeds during Year 2.
4. **Mineral coating.** It is easy to apply lime or rock phosphate onto seeds following inoculation using the three-step method. This is achieved by applying excess sticker during the two-step method, and then adding finely ground minerals and shaking a final time. Care must be taken not to apply minerals that are acidic, such as triple super phosphate or sulfur, as seed coats as these kill rhizobia. In general, between 10% to 30% of seed mass may be coated by minerals, with more applied to smaller seeds. Project agronomists are expected to develop recommendations on seed coating during the second year of the project.
5. **Better fertilizers.** BNF proceeds best in the absence of available mineral nitrogen in the soil solution. As a result, few fertilizer blends are intended for grain legumes because they contain nitrogen. At the same time, symbiotic legumes require more phosphorus, magnesium and micronutrients. For this reason, project agronomists will examine different fertilizer combinations within different soil types during Year 1 and develop a recommendation concerning fertilizer forms and blends during Year 2. It is likely that the project will identify specific P-K-Mg-S-micronutrient blends for use on symbiotic grain legumes and work with fertilizer manufactures to commercialize them during Year 3.
6. **Planting pellets.** One possible outcome from the project is the development of pellets that are intended for planting alongside legume seeds. This practice is quite feasible considering the hand operations practiced by small-scale farmers and is one means to avoid the toxic effects of pesticides coated onto legume seeds. Planting pellets may consist of a mineral core (e.g. pelletized rock P, adhesive, rhizobial inoculant and outside coating of limestone, and can be sold alongside treated legume seeds. One advantage of a planting pellet is that it may deliver many more rhizobia than conventional inoculation. Obviously, this product requires careful design and study by microbiologists, agronomists and marketing specialists but is a possible dissemination tool for use in extension activities at the latest stages of project activities.



## 2. Country-specific implementation plan: Kenya

To a large extent, extension activities in west Kenya were driven by the expected long rains (March to June) so that the Year 1 implementation plan is also an account of what has already occurred. The outreach activities will first rely upon the existing WERATE network of farmer associations, CBOs and NGOs, and then incorporate extension officers and local farm input suppliers.

**Step 1: Participation.** First, 21 representatives of grassroots organizations and other potential partners were invited to a one-day workshop at the Rock Motel, Kisumu on 28 January 2010 to present opportunities for collaboration with N2Africa in west Kenya, cooperators expectations, proposed activities and time frame for the 2010 long rains. The organizations, contacts and contact details of these participants appear in Table 6. The organizations represented at this planning meeting, and their affiliates have the capacity to directly engage 27,000 farm households. At the meeting, half the organizations were represented by women and 75% nominated a women's representative to the project to collaborate in Activity 4.5.

**Table 6: Participation in the N2Africa West Kenya Outreach Planning Workshop, Rock Motel, Kisumu, 28 January 2010.**

Organization	Lead contact	Area of operation	Lead woman
TSBF Nairobi	Paul Woomer	We RATE Kenya	Mariam Imbumina
TSBF Maseno	J.B. Mukalama	Nyanza & Western	na
Hagonglo CBO	A. Magaga	Bondo, Siaya & Rurieda	Pam Ogutu
SCC-Agroforestry Project	Jane Achieng	Kisumu, Nyando, Nyakach	same
Kleen Homes & Gardens	Josephine Ongoma	Butere, Mumias	same
Bungoma Small-Scale Farmers Forum	Bonface Wamalwa	Bungoma Central, West & North	Felistas Tenge
Butere Soybean Farmers Federation (BSFF)	Dorcas Akeyo	Butere & Khwisero	same
MUDIFESO Project	Stephen Kasamani	Mumias & Matungu	Jane Kodiah
URIRI Farmers Cooperative Ltd	Chris Onyongo	Nyanza (5 districts)	Dorcas Ogala
CYEEP	Clive Shwachi	larger Kakamega	Margret Awinja
Resource Projects Kenya	Patrick Nekesa	7 districts in Nyanza and Western	Christine Nolega
Kenya Soybean Farmers Association	George Kirandah	27 districts	Florance Masitsi
Butula Farmer Field School	Livingston Osuru	Butula	
ARDAP	Macdonald Wesonge	Busia, Bungoma, Teso, Siaya	Alice Masinde
Maseno University	G. Odhiambo	Kisumu, Nyando, Nyakech	



**Step 2: Inputs Secured.** Sources of seed, inoculants, adhesives and fertilizers were identified as:  
**Seed:** soybean var SB 19, bush bean var New Rosecoco, climbing bean var Kenya Mavano. Soybean was obtained from TSBF (850 kg) and beans from TL2/UoN (260 kg). Presently 755 kg of seed are being multiplied by outreach cooperators in west Kenya. Seed of SB 20 (450 kg) was also purchased (\$1.20 per kg) for outreach activities during the 2010 long rains.

**Inoculant:** BIOFIX rhizobial inoculants are manufactured by MEA Fertilizer Ltd in Nakuru. BIOFIX sells for \$1.25 per 100-g packet, but arrangements were made with MEA to provide 480 packets of BIOFIX to Kenyan outreach activities free-of-charge.

**Adhesive:** Gum arabic intended for a 9% solution is normally provided with each BIOFIX package. The literature suggests that this concentration is low so arrangements were made to acquire 3 kg of gum arabic in order to prepare 18 liters of a 16% solution in 500 ml plastic bottles.

**Fertilizers:** MEA also offered a 30% discount on fertilizers. Three tons of SSP fertilizer packaged into 2 kg plastic bags was purchased for \$1.13 per kg. We also purchased 600 kg of SSP in 50 kg bags for use in seed multiplication.

**Step 3: Field protocols developed.** Next three field protocols were developed and materials assembled, one each for legume enterprise, soybean inoculation requirements and climbing bean management. The legume enterprise is considered the core field demonstration that describes six “best practice” legume management technologies for bean and soybean, inoculated and not inoculated, with each demonstration packaged into a 20 liter bucket assembled at two different distribution points. Thirty (30) of these demonstrations were prepared for distribution in 16 administrative districts of west Kenya and 50 satellite farmers provided “take-away” kits from each one. These “take-away” kits consisted of 400 g of recently inoculated seed, 2 kg of fertilizer and instructions translated into Kiswahili. Report forms were also developed to formalize information collected from these demonstrations. Laminated signs describing legume technologies for use in upcoming farmer field days were prepared by a local printer. These demonstration packages and accompanying information (Photograph 1) represent a prototype dissemination tool described in Activity 4.2, and its deployment a central feature in the Year 1 extension campaign targeting 1500 households in West Kenya (Activity 4.4).

**Step 4: Technologies Deployed.** The outreach effort established 52 demonstrations, established community-based seed production with 652 kg of seed and provided 1550 farm households with BNF technology test packages intended for 200 m<sup>2</sup> each (Table 7). These 48 ha of soybeans and beans are expected to produce 130 tons of grain worth \$70,530 that fix 5150 kg of N with a fertilizer substitution value of \$11,640. Farm inputs were deployed by first establishing two distribution points at RPK and ARDAP, that effectively covered the northern and central project areas, and then engaging TSBF to distribute materials in southern Nyanza. Assembling the demonstration kits and farmer test input packages required four days (5 to 8 March) and they were delivered to individual cooperators between 9 and 15 March.



**Photograph 1: Components of the N2Africa: West Kenya Outreach Dissemination Tool.**



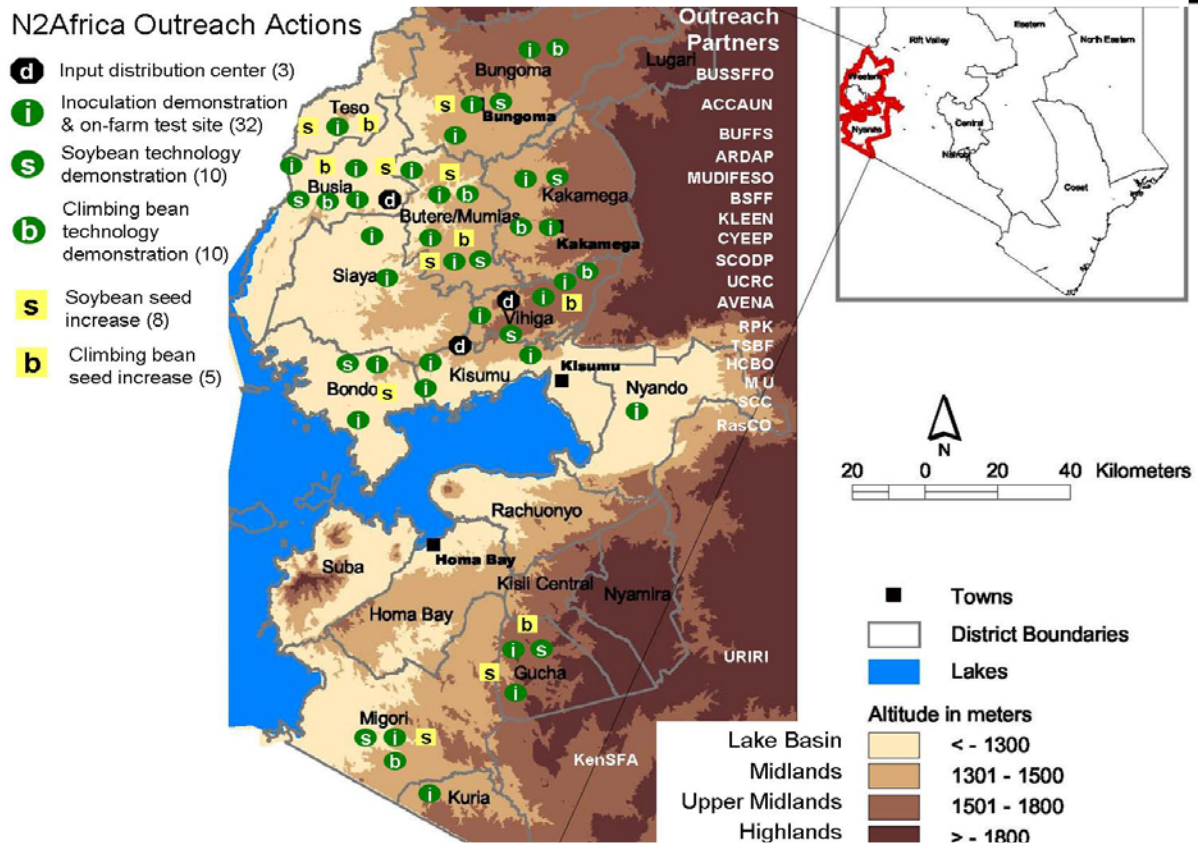


Figure 2: Map of west Kenya showing the locations of different N2Africa Kenyan Outreach activities during the 2010 long rains growing season.





**Table 7: N2Africa Kenya Outreach partners and their involvement in field campaigns during the 2010 long rains growing season.**

Organization	Role <sup>1</sup>	Demonstrations			Seed production		Member households	
		core	CB	SB	CB	SB	N2A participants	total
			no		kg			
Hagonglo	CBO	2	0	1	0	50	100	2100
SCC	WG	2	0	0	0	0	100	500
Kleen H&G	CBO	2	1	1	20	35	100	500
BuSSFFO	FA	3	1	1	0	90	150	1230
BSFF	FA	2	1	1	20	0	100	1000
MUDIFES	CBO	2	1	1	0	0	100	1000
URIRI	FA	2	0	1	10	100	100	1105
CYEEP	CBO	2	1	1	0	35	100	600
RPK	NGO	1	1	1	22	0	50	5500
KenSOFA	FA	2	1	1	0	100	100	10000
BFFS	FA	2	1	0	0	35	100	500
ARDAP	NGO	1	1	1	20	40	50	1000
Maseno	UOP	2	0	0	0	0	100	300
ACCAUN	FA	2	1	0	10	70	100	1600
SCODP	NGO	1	0	0	0	0	0	na
UCRC	NGO	1	0	0	0	0	50	na
Nambale	WG	1	0	0	0	0	50	50
AVENE	FA	1	0	0	0	0	50	na
Mwangaza	FA	1	0	0	0	0	50	na
<b>19 organizations</b>		<b>32</b>	<b>10</b>	<b>10</b>	<b>102</b>	<b>555</b>	<b>1550</b>	<b>26985</b>

<sup>1</sup> Roles: CBO = Community-based Organization, FA = Farmer Association, NGO = Non-governmental Organization, UOP = University Outreach Program and WG = Women's Group.

Each cooperator's demonstration/farm test package is 200 kg and we are able to deliver up to five at a time in a one ton pickup. The WE RATE Network effectively covers the entire project area in western Kenya, and we intend on intensifying farmer participation within it, as well as add some additional cooperators to fill gaps in central Nyanza and the northern Lake Basin (Figure 2).

**Step 5. Support Actions in Year 1.** The actions described above in Steps 1 to 4 address the development of dissemination tools (Activity 4.2.1), the acquisition of grain legume seed (Activity 4.3.1) and the launching of a BNF technology field campaign (Activity 4.4.1 and 4.4.2, see Table 2). Other actions required for Year 1 and our planned response follow.

**Activity 4.1.1. MoUs formalized.** These agreements are being developed and will be completed by 31 March 2010.

**Activity 4.4.3. Extension events conducted.** WE RATE Cooperators agreed to conduct 16 farmer field days built around BNF technologies later during the long rains growing season. They will also prepare an exhibit for the annual provincial agricultural shows in Nyanza (in Kisumu) and Western (in Kakamega) that will be held later in 2010.

**Activity 4.4.4. Mass media events organized.** A short (e.g. 8 minute) documentary will be developed in collaboration with the Kenya Broadcasting Corporation (KBC). A documentary outline will be prepared by mid-May 2010 and KBC will send a film crew to cover selected farmer field days later that month. Experience suggests that two months are required to complete the documentary and that it will be showed during news and information broadcasts several times over the next few years.



**Activity 4.5.3. Special events on women's grain legume enterprise conducted.** WE RATE has organized a women's network among N2Africa cooperators and each will present an exhibit reinforced by local materials at their respective farmer field days in May and June 2010 (see Table 6). This exhibit will also be presented at the annual provincial shows.

**Anticipated activities in Years 2, 3 & 4.** In the following years the remaining activities and milestones in Table 2 will be addressed as follows.

**Activity 4.1.2. Co-funding/financing options identified.** Outreach partners and MIRCEN (Objective 3) will work with MEA Fertilizer Ltd. to improve and expand its BIOFIX operations (Year 2). A collaborative proposal for better marketing and processing grain legumes will be developed with the AGRA Marketing Section (Year 2).

**Activity 4.1.3. Satellite sites established.** The WE RATE network covers the west Kenya project area fairly well (Figure 2) but some gaps exist. Not all partners, however, have been engaged in the project and we intend to recruit additional development partners in central (The Catholic Diocese) and north (OTIT) Nyanza using their own resources. A proposal is being prepared for submission to RUFORUM's Community Action Research Program to include additional groups in three districts in Western Province. Other satellite sites will be identified as opportunities arise.

**Activity 4.2.1. Dissemination tools developed.** Three technology dissemination tools were developed in preparation for the 2010 long rains growing season. These will be refined over the next year and information materials built around them. A potent dissemination tool is the development of a grain legume enterprise package developed in collaboration with the private sector (e.g. MEA Ltd.) that is intended for 1000 m<sup>2</sup> and extended on credit to farmer associations and local stockists.

**Activity 4.3.2. Seed production initiated.** This goal was achieved during Year 1 and will continue into Year 2. The project has agreed to provide farmer groups engaged in grain legume seed production with P fertilizer and BIOFIX inoculant as an incentive.

**Activity 4.3.3. Market outlets established.** Beans are readily marketed through existing channels, local markets, local institutions and wholesale buyers, but it is important that seed types not be mixed as this lowers their value. In Year 2 cooperators will receive training in post-harvest handling of beans. Kenya has a 30,000 t soybean deficit which is being addressed through several channels; a major buyer is BIDCO, a Kenyan food processor. The project will also establish quality control procedures in Year 2, collection points and forward contracting in Year 3 to assist its clients to participate in soybean marketing. These actions will be included within the abovementioned collaboration with AGRA.

**Activity 4.3.4. Legume processing established.** Value may be added to soybeans through processing, but much less so to beans. Local processing options include milling of flour, parching into crispy snacks and pressing of soy milk. These local initiatives will be linked to Activity 5: Women empowerment. The Food Security and Household Nutrition Section of ARDAP will take leadership in this area as it is already engaged in grain legume processing.

**Activity 4.5.1. Gender analysis.** A draft ToR for gender specialist has been developed and circulated among project members. The plan is to advertise this position. The identified consultant will develop tools (questionnaires) for surveys that will be conducted in all 8 project countries or selected countries per hub. The questionnaire will be returned to the consultant for analysis, desk survey and report writing. This report will be synthesized and used to formulate N2Africa strategies to ensure gender mainstreaming in N2Africa activities.

**Activity 4.5.2. Annual gender reporting.** Records are being kept concerning gender participation in all farmer-related activities. A women's representative was identified for most cooperators. Information from these sources will be compiled into a report submitted in Years 2, 3 & 4.



### 3. Country-specific implementation plan: DR Congo

With currently weak agricultural extension services in DR Congo, and no extension service in south Kivu, dissemination of legume and inoculants technologies is done by three NGOs supported by TSBF- CIAT office in Bukavu. The NGOs are Service and Capacity of Self Promotion of Women in South Kivu (SARCAF), Program Support to Sustainable Development (PAD) and PLATFORM DIOBASS. The NGOs are platforms of smallholder community organizations (CBOs) that struggle to solve agricultural challenges in their ecosystems. The dissemination activities will rely upon these NGOs who have capacity to engage 18,750 farming households by year four of the project.

**Step 1: Participation.** To kick start activities in DR Congo, 18 representatives of NGOs, community based organizations and collaborating projects were invited to a one-day workshop at CIALCA offices in Bukavu on 5 February 2010. Participants were informed of opportunities for collaboration with N2Africa in South Kivu, quality, conditions and expectations from partners, proposed activities and time frame for the 2010 long rains. Names of participants to the workshop, contacts and organizations they represented are summarized in Table 8.

**Table 8: List of participants in the N2Africa planning meeting in Bukavu, 5 February, 2010.**

No.	Name	Institution
1.	FAUSTIN BAFUNYEMBAKA	CIALCA
2.	DIEUDONNE MONGANE	CIAT/BNF
3.	FIDELE BARHEBWA	PAD/BKV
4.	WALANNGULULU MASAMBA	UCB/BKV
5.	NONO MWAVITA	SARCAF
6.	ADRIEN CHIFIZI	DIOBASS
7.	ETIENNE BITORWA LUNYEL	SARCAF
8.	SANGINGA JEAN-MARIE	CIAT/BNF
9.	CHARLES BISIMWA	CIALCA
10.	RENE RUBAMBURA	PAD/BKV
11.	SYLVAIN MAPATANO	DIOBASS
12.	RODRIGUE BAHATI	VLIR/UCB
13.	ALAIN MAKELELE	SARCAF
14.	JANVIER BASHAGALUKE	UCB/BKV
15.	BAHOGWERHE MUSABE	SARCAF
16.	IRENGE YVES	CIAT/BNF
17.	JEAN-SERGE MASEMO	PAD
18.	SERGE RAMAZANI	PAD
19.	BERNARD VANLAUWE	CIAT-TSBF

#### **Step 2: Inputs Secured**

**Seed:** soybean varieties PK 6, Imperial, SB 19 and SB 24; bush bean varieties CODMLB 001, AFR 10; MORE, RWK 10 and Murungi; climbing bean varieties VCB 81012, AND 10, MUSALE, Kiangara and Nyiramyhundo. Soybean was obtained from CIALCA a project co-jointly implemented by TSBF and IITA (180 kg) and beans from the Institute of Agricultural Research (INERA) Mulungu (40 kg). Although INERA is committed to continue supply of bean seeds at USD 2 /kg, it is planned that each partner NGO arrange to multiply 1500 kg soybean and 900 kg beans in each season.

**Inoculant:** About 2 kg (in packets of 10 g) of BIOFIX rhizobial inoculants manufactured by MEA Fertilizer Ltd in Nakuru, Kenya were imported into DR Congo. A technician from MEA Company travelled to Bukavu where he trained technicians from partner NGO on use of inoculants. Arrangements have been made for MEA Fertilizer Ltd to supply BIOFIX each season as required.

**Adhesive:** The imported BIOFIX is normally packed with Gum Arabic adhesive, and directions on its use.



**Fertilizers:** Fertilizers TSP (250 kg), DAP (50 kg), MOP (50 kg) and Urea (50 kg) were imported into DR Congo from MEA Fertilizers Ltd. There is no private company interested in importing mineral fertilizer to Bukavu and limited possibilities of importing from neighboring countries Rwanda and Burundi. Because of this the supply of fertilizers to Bukavu will continue to come from MEA fertilizer Ltd, Kenya.

**Step 3: Field protocols developed.** In the first season three field protocols were developed and materials assembled, one each for legume enterprise, soybean inoculation and P requirements; climbing bean and bush bean management and input (P,K) requirements. The soybean inoculation and P requirement demonstrations were considered the core field demonstrations. These will add knowledge to communities that have been in production of legumes several decades. One hundred and eighty (180) take away kits (consisting of 1 kg soybean seeds, 10 g inoculants and 270 g TSP) were prepared for distribution in 7 administrative territories of south Kivu.

**Step 4: Technologies Deployed.** In the long rains season 2010, the outreach efforts established a total of 172 demonstrations, in all 7 administrative territories and were implemented by 72 farmer associations. These were built around 28 adaptive trials (4 in each territory). The adaptation packages are expected to increase to 1,500 in the short rains season 2010, where they will expand to include legume variety inoculation and system interactions. The increased number of packages requires having about 500 kg soybean seeds, 500 kg bush beans and 500 kg climbing beans seeds. Arrangements have been made to multiply these seeds as indicated in Table 9.

**Table 9: Plan of partners to multiply soybean, bush beans and climbing bean seeds**

Partner	Site	Area Soybean (ha)	Area Bush bean (ha)	Area Climbing bean (ha)
DIOBASS	Kabare	0.25	0.25	0.25
	Muezi	0.25	0.25	0.25
PAD	Mulamba	0.25	0.25	0.25
	Biriava	0.20	0.20	0.20
	Kalehe	0.20	0.20	0.20
SARCAF	Ikoma	0.20	0.20	0.20
	Mimosho	0.20	0.20	0.20
<b>Total</b>		<b>1.55</b>	<b>1.55</b>	<b>1.55</b>

**Step 5. Support Actions in Year 1**

**Activity 4.1.1. MoUs formalized.** Memorandum of understanding were formalized and signed between CIAT and partners DIOBASS, PAD and SARCAF in 31 March 2010.

**Activity 4.4.3. Extension events conducted.** Forty three farmer field days have been conducted around the demonstration sites. Each organization is planning to conduct one exhibition on legume technologies in each growing season.

**Activity 4.4.4. Mass media events organized.** A media event organized by Wageningen University filmed footage at various Project sites and a short (15 minute) documentary has been developed. The N2Africa office in Bukavu is following up on this documentary for further promotion. The filming team left behind a simple but good camera which will be used to film more project activities. A plan that considers including other media including FARM RADIO, Radio Maendeleo (a local radio station) has been developed and actions are to be taken beginning 2011 long rains season. This includes integrating various radio clubs in the programs of a local radio, organizing weekly transmissions where all partners are involved and collection of detailed media events including copies of broadcasts.

**Activity 4.5.3. Special events on women's grain legume enterprise conducted.** The project will organize training sessions for women's network among N2Africa cooperators focusing on women empowerment and increasing productivity. Capacity building on Land rights, credit, conservation, processing and commercialization of product will be organized in the coming seasons. The outreach team plans to organize a debate on gender and agricultural development and promote active participation of women in the field days. It is also planned to strengthen the linkages between women groups across partner organizations through exchange visits that will facilitate sharing of experiences.



**Anticipated activities in Years 2, 3 & 4.** In the following years, the remaining activities and milestones listed in Table 2 will be implemented as follows:

**Activity 4.1.2. Co-funding/financing options identified.** TSBF and MIRCEN will work with MEA Fertilizer Ltd. to improve and expand its BIOFIX operations in DR Congo (Year 2). TSBF planning to develop a collaborative proposal for better marketing and processing grain legumes with Bukavu Catholic Diocese (Year 2).

**Activity 4.1.3. Satellite sites established.** With the required year after year increase in number of farmers (directly and indirectly) benefiting from the project; partners have worked a formula to establish satellite sites within and outside the current action sites. From the current 7 administration territories, the number will increase to 13 (See Map) with each partner working in at least 5 territories. Satellite sites will be established in both old and new territories for scaling up.

**Activity 4.2.1. Dissemination tools developed.** Three technology dissemination tools were developed in preparation for the 2010 long rains growing season. These will be refined in the 2010 short rains season to include field books to monitor and evaluate the impact of disseminated knowledge. Production of radio programs, posters and leaflets around specific themes of the project.

**Activity 4.3.2. Seed production initiated.** This goal will be achieved in the 2010 short rains season and will continue into Year 2 and 3. The project has agreed to provide farmer associations, through lead NGOs initial seeds and P fertilizer an incentive.

**Activity 4.3.3. Market outlets established.** In DR Congo, beans are readily marketed through existing channels, largely local markets and vendors. Most farmers are forced to sell their produce soon after harvest as they fear losses due to storage pests. In Year 2 farmers will receive training in post-harvest handling of beans. Efforts are being made to introduce double bag (PICS) technology. Farmers in south Kivu have a long history of soybean production and local utilization but large markets are limited. The project will establish link with the Clinton Foundation which is contracting a soybean oil extraction plant in the neighboring country Rwanda, which is an opportunity to absorb all quantities produced in south Kivu.

**Activity 4.3.4. Legume processing established.** This activity is specific for soybean as beans are easily marketed as grains. However, the project will engage nutritionists to look into possibilities of developing different recipes for beans. People in south Kivu local process soybean into flour, parching into crispy snacks and pressing of soy milk. These local initiatives will be promoted to reach more farmers through different participating farmer organizations.

**Activity 4.5.1. Gender analysis.** A draft ToR for gender specialist has been developed and circulated among project members. The plan is to advertise this position. The identified consultant will develop tools (questionnaires) for surveys that will be conducted in all 8 project countries or selected countries per hub. The questionnaire will be returned to the consultant for analysis, desk survey and report writing. This report will be synthesized and used to formulate N2Africa strategies to ensure gender mainstreaming in N2Africa activities.

**Activity 4.5.2. Annual gender reporting.** Records are being kept concerning gender participation in all farmer-related activities. More than 60% of participating farmers are women. Moreover, the project has a plan to facilitate the discussion between partner organizations to develop a work plan that will ensure that gender issues are reported at the end of each season.





## 4. Country-specific implementation plan: Rwanda

Dissemination activities in Rwanda are mainly implemented by three NGOs; Consultative Council of Women (COCOF); Rwanda farmers Federation (IMBARAGA) and Sustainable Rural Development (DRD), -and are coordinated by the country project field liaison officer based in Kigali. The dissemination activities in Rwanda started during 2010 long rain season (March-June) building on experiences of partners of different mandate areas.

**Step 1: Participation.** A two day workshop to introduce the project objectives, target areas and deliverables was organized on 3-4, February 2010 in Kigali and was attended by 12 people representing potential collaborators from NGOs, Community Based Organizations, government institutions and projects with related activities in Rwanda (Table 10). Participants were informed of opportunities for collaboration with N2Africa. Partner organizations with capacity to directly engage 18750 farming household in 3 years were identified and agreed on activities and drafted the work plan.

**Table 10: Participants of N2Africa planning meeting in Kigali, 3-4, February 2010**

Names	Organization
Gahigi Aimable	ISAR/TSBF (CIALCA)
Ukozehasi Celestin	TSBF (CIALCA)
Byamushana Cassien	ISAR
Nzeyimana Felix	ISAR-TSBF(BNF)
Kantengwa Speciose	TSBF(BNF)
Uwizera Marthe	COCOF
Ngoga T. Gislain	ISAR
Manirere J D' Amour	DERN
Bernard Vanlauwe	TSBF
Umufwaneza Alice	TSBF(BNF)
Gafaranga Joseph	IMBARAGA
Musoni Augustine	ISAR

### **Step 2: Inputs Secured**

**Seed:** soybean varieties PK 6, Soprosoy, SB 19, SB 24 and Yezumutima; bush bean varieties RWR1668, RWR 2076, RWR 2154, RWR2245 and RWR 1180; climbing bean varieties Gasilida, RWV 2070, MAC44, Mamesa and CAB2. Soybean was obtained from CIALCA project (190 kg) and beans from National Agricultural Research Institute (ISAR) and Harvest plus (60 kg).

**Inoculant:** About 2 kg (in packets of 10 g) of BIOFIX rhizobial inoculants manufactured by MEA Fertilizer Ltd in Nakuru, Kenya were imported into Rwanda. TSBF engaged a technician from MEA Company to train field technicians from partners on use of inoculants. Arrangements have been made for MEA Gum Arabic adhesive, and directions on its use.

**Fertilizers:** Fertilizers TSP (300 kg), DAP (50 kg), MOP (50) and Urea (50 kg) were obtained. The Rwanda Government has developed a fertilizer subsidy scheme encourages the main dealer in fertilizers (Premium Agro Chemical) to import DAP. Through N2Africa outreach activities, the potential of using TSP or Minjingu RP will be demonstrated. This should provide evidence to help convince the Government to diversity the types of fertilizers imported.

**Step 3: Field protocols developed.** In the first season three field protocols were developed and materials assembled, one each for legume enterprise, soybean inoculation and P requirements; climbing bean and bush bean management and input (P,K) requirements. The soybean inoculation and P requirement was considered the core field demonstration. These will add knowledge to communities that have been in production of legumes several decades. Two hundred thirty (230) take away kits (consisting of 1 kg soybean seeds, 10 g inoculants and 270 g TSP) were prepared for distribution in five administrative districts, 2 in the north, 1 in the south and 2 in the eastern part of Rwanda.





**Step 4: Technologies Deployed.** In the long rains season 2010, the outreach efforts established a total of 190 demonstrations, in 12 action sites. These dissemination activities were built around 30 adaptive trials, about 4 trials in each district. The adaptation packages are expected to increase to 1,600 in the short rains season 2010, and they will include legume variety inoculation, climbing beans-maize rotation, soybean-maize rotation as well as cassava-legume intercropping. To ensure availability of seeds for technology up scaling, different partners have developed a plan to bulk seeds as indicated in Table 11. The amount of seed to be produced will increase year after year to meet the demand of additional farmers reached by the project

**Table 11: Details of seed multiplication by different partners in Rwanda**

Organization	Site	Area soybean (ha)	Area bush bean (ha)	Area climbing bean (ha)
DRD	Kinoni	-	-	0.20
	Nemba	-	-	0.20
	Kivuruga	-	-	0.20
	Cyabingo	-	-	0.20
COCOF	Musambira	0.25	0.25	-
	Nyamiyaga	0.25	0.25	-
	Nyambaka	0.25	0.25	-
IMBARAGA	Rukara	0.25	0.25	-
	Nyamirama	0.25	0.25	-
	Rwinkwavu	0.25	0.25	-
	Musenyi	0.25	0.25	-
	Mareba	0.25	0.25	-
Total		2.00	2.00	1.40

#### **Step 5. Support Actions in Year 1**

**Activity 4.1.1. MoUs formalized.** Memorandum of understandings were formalized and signed between CIAT and partners COCOF, IMBARAGA and DRD in April 2010.

**Activity 4.4.3. Extension events conducted.** Six farmer field days have been conducted around the demonstration sites. A plan has been developed where each partner organization will be required to conduct at least one exhibition on legume technologies during the growing seasons.

**Activity 4.4.4. Mass media events organized.** A media event organized by Wageningen University made film footage at various Project sites and a short (15 minute) documentary has been developed. This documentary will be used to further promote project activities. The filming team left behind simple but good camera which will be used to film more project activities. A plan for having more media events including contacting FARM RADIO, and having copies of broadcasts has been developed.

**Activity 4.5.3. Special events on women's grain legume enterprise conducted.** Capacity building activities on advocacy for rights for women to manage natural resources (including land tenure) are planned for year 2. A consultative discussion between the various partner's organizations to come up with specific action plans is undergoing.

**Activity 4.1.2. Co-funding/financing options identified.** TSBF and partner organization DRD are already working with other project doing similar activities in Rwanda including CIALCA and Harvest plus. Harvest plus distributed subsidized climbing bean seeds to farmers. CIALCA project also provided seeds of soybean and bush beans. Also, the TLII project will start working in Rwanda, creating an opportunity for resource sharing with N2Africa.

**Activity 4.1.3. Satellite sites established.** With the required year after year increase in number of farmers (directly and indirectly) benefiting from the project; partners have worked a formula to establish satellite sites within and outside the current action sites. In Rwanda, each project partner developed a plan to broaden partnership to move gradually towards engagement of more households within and outside action sites. Moreover, other local organizations including CARITAS-Rwanda, Medicus Mundi, Women for Women, Clinton Foundation and EPR have been engaged and provided



with technologies N2Africa is testing to try out in the areas of operations. These are regarded as additional satellite sites and will be included in the M&E plan for Rwanda.

**Activity 4.2.1. Dissemination tools developed.** Three technology dissemination tools were developed in preparation for the 2010 long rains growing season. These will be refined in the 2010 short rains season to include field books to monitor and evaluate impacts of disseminated knowledge. Plans are under way to produce radio programs, posters and leaflets around specific themes of project.

**Activity 4.3.2. Seed production initiated.** In Rwanda, basic seed requirements of soybean, bush beans and climbing beans are available through other initiatives including the CIALCA project, Harvest plus and ISAR. Moreover, all farmer associations working under partner institutions are already involved in seed multiplication and have plans to produce 2000 kg of soybean seeds, 1,500 kg of bush bean seeds and 1,500 kg of climbing bean seeds every season. Partner organizations are developing a strategy for seed multiplication within each of associations at various action sites.

**Activity 4.3.3. Market outlets established.** All beans produced in Rwanda are locally consumed and excess is easily marketed at local markets, though at low process. Various initiatives on marketing of legumes including beans and soybean including the Clinton Foundation, AGRA, Women for Women International and EPR Kiyovu. The project will partner with these market initiatives to ensure that farmers are linked to secure and remunerative markets.

**Activity 4.3.4. Legume processing established.** There are already other initiatives promoting legume processing, the larger one being the Clinton Foundation, which is funding a project to construct a soybean oil extraction factory. Other initiatives by CARITAS,-Rwanda, Medicus Mundi and Women for Women International are working on value addition of soybean through production of fortified infant feeds, soy milk extraction etc. The project will partner with these processing initiatives to ensure that such value addition enterprises are known, and demonstrated in the N2Africa communities.

**Activity 4.5.1. Gender analysis.** A draft ToR for gender specialist has been developed and circulated among project members. The plan is to advertise this position. The identified consultant will develop tools (questionnaires) for surveys that will be conducted in all 8 project countries or selected countries per hub. The questionnaire will be returned to the consultant for analysis, desk survey and report writing. This report will be synthesized and used to formulate N2Africa strategies to ensure gender mainstreaming in N2Africa activities.

**Activity 4.5.2. Annual gender reporting.** Records are being kept concerning gender participation in all farmer-related activities. More than 55% of participating farmers are women. All partners have plans to mainstream gender in their activities the impact of which is analyzed and reported at the end of each season.



## 5. Country-specific implementation plan: Nigeria.

There is a thin presence of NGOs in Northern Nigeria that are involved in dissemination of agricultural technologies. Hence, government extension agencies, at both state and local government levels, are the major organs involved in dissemination. The project's major partners in the implementation of the dissemination and extension activities are the Agricultural Development Projects (ADPs) and the Local Government (LGAs) of both Kaduna and Kano States. These are being complemented by Sasakawa Global 2000 (SG2000) which is an NGO. These organizations work with farmers at the grassroots and have the capacity to directly engage 27,000 farm households.

**Step 1: Participation.** The implementation plan for Nigeria was developed at the National Planning Meeting which took place on 21-22 April 2010. Over 40 representatives of State and Local Governments, Agricultural Extension Services, grassroots organizations, research institutes, universities, input dealers and other potential partners attended the two-day workshop at the IITA Kano Station to present cooperators, expectations and opportunities for collaboration with N2Africa in Kaduna and Kano States and to decide on tasks, proposed activities and time frame for the 2010 rainy season. The organizations, contacts and contact details of these participants appear in Table 12. It was at this meeting that the LGAs, ADPs and SG2000 were selected to lead the dissemination activities of the project.

**Table 12: Participants' list representing partner organizations at the Nigeria Planning Meeting, held on 21-22 April 2010**

Organisation	Lead contact	Area of operation
Ministry of Local Govt. (MoLG), Kaduna State	Ibrahim I. Musa	Kaduna State
MoLG, Kaduna State	Mrs Agnes Katung	Igabi LGA
MoLG, Kaduna State	Mrs Christie Kpatuwak	Kachia LGA
MoLG, Kaduna State	Mrs Rifkatu James	Zangon Kataf LGA
MoLG, Kaduna State	Tijani Ibrahim	Giwa LGA
MoLG, Kaduna State	Muhammad Jibril	Soba LGA
Kaduna State ADP	Daniel E. Jacob	Kaduna State
Farmer Cooperative Gwada	Sale Ibrahim	Igabi LGA, Kaduna
SG2000	Idris Saidu Garko	Kaduna and Kano
Diamond Devt. Initiative	Adamu Garba	Kaduna and Kano
MoLG, Kano State	Atiku Mohammed Yola	Kano State
Kano State Agric. & Rural Devpt. Authority (KNARDA)	Balarabe Shehu	Kano State
MoLG, Kano State	Jibrin Safiyanu	Garko LGA
	Kachako	
MoLG, Kano State	Garba U. Kanti	Albasu LGA
MoLG, Kano State	Abdul Balarabe	Bichi LGA
MoLG, Kano State	Habibu Yakubu	Dawakin Kudu LGA
MoLG, Kano State	Bashir Tudun Wada	Bunkure LGA
MoLG, Kano State	Musa Bala	Warawa LGA
Yakasai Farmer Cooperative	Maianguwa Ibrahim	Bichi LGA, Kano
	Yakasai	
IAR/ABU Zaria	Ishaku Y. Amapu	Northwest Nigeria
IITA/COMPRO	Ado Yusuf	Kaduna and Kano
JubailiAgrotec Ltd	Mohammed S. Saadeh	Northern Nigeria
Bicco Agropducts	Babalola Samuel	Northern Nigeria
Cybernetics Nig. Ltd.	Pius Kole-James	Northern Nigeria
Crystallizer Nig. Ltd.	Capt. Mohammed	Northern Nigeria
	Musa	
African Agro	Titus Igbe	Northern Nigeria
IITA/TLII	Alpha Y. Kamara	
IITA/PICS	Abdoulaye Tahirou	
W/African Seed Alliance (WASA)	Lawrence O. Fajana	West Africa



**Step 2: Inputs Secured.** Procurement of seeds, inoculants, adhesives and fertilizers will be organized as follows:

**Seed:** About 800 kg each of soybean and groundnut seeds and 1 t of cowpea were procured for the dissemination activities of the 2010 rainy season. Soybean varieties TGX 1830, TGX 1835, TGX1485, and TGX1987 are being disseminated in the Sudan savanna of the mandate areas, while the Northern and Southern Guinea savanna areas have been provided with varieties TGX1904, TGX1935, TGX1945 and TGX1951. Cowpea varieties IT90K-277-2, IT97K-499-35, IT89KD-391, and IT99K-573-1-1 are being disseminated in the Sudan and Northern Guinea savanna parts of the project; while varieties IT90K-277-2, IT97K-499-35, IT93K-452-1, IT99K-573-1-1 and IT89KD-288 were deployed in the southern Guinea savanna. Groundnut varieties SAMNUT 21, 22, 23, and RMP 12 are being extended across all agro-ecologies, with variety ExDakar to be used as check.

Seeds were procured from different sources, including seed producers organized and trained by the TL-II project and the Sub-Saharan Africa Challenge Programme (SS-KKM). Additional seeds were procured from Seed Project Nig. Ltd, which has just received a grant from AGRA. The West African Seed Alliance (WASA) also provided about 3 kg of groundnut seeds of various varieties for seed multiplication.

**Inoculant:** About 4 kg of rhizobial inoculant was procured for soybean; imported from a United Kingdom-based company, 'Legume Technology Ltd'. This was necessary due to the absence of similar companies in Nigeria that are engaged in local production. Inoculants were given to farmers free of charge as part of the mobilization effort in the initial phase of the project.

**Adhesive:** About 2 kg of gum Arabic was purchased from local markets, processed and distributed to soybean farmers along with the inoculant.

**Fertilizers:** A total of 340 50kg bags of SSP were purchased for Year 1 dissemination activities. Fertilizer was purchased from IFDC-certified agro-input dealers and repackaged into 1 kg plastic bags to be given to farmers.

**Step 3: Field protocols developed.** Field protocols were developed and materials assembled for legume enterprise (three each for cowpea, groundnut and soybean). The protocol describes "best practice" legume management technologies for cowpea, and groundnut as well as soybean, inoculated and not inoculated. Forty two (42) demonstrations were prepared for soybean with each demonstration packaged into a 20 liter bucket. Fifty five (55) demonstrations were developed for cowpea and forty three (43) for groundnut. The demonstrations have been distributed in 8 local governments in Kano State and 5 in Kaduna State. Fifteen (15) satellite farmers were provided with "take-away" kits from each demonstration. These "take-away" kits consisted of 1 kg seeds of one of the several varieties being extended at each action site and 5 kg of SSP fertilizer. Report forms have also been developed to formalize information collected from these demonstrations.

**Step 4: Technologies Deployed.** The outreach effort established a total of 140 demonstrations and provided 2240 farm households (1072 in Kaduna and 1168 in Kano) with BNF technology test packages intended for 200 m<sup>2</sup>. These 67 ha of cowpea, groundnut and soybeans are expected to produce 106 t of grains worth \$92,074 that fix 2,047 kg of N with a fertilizer substitution value of \$2,792.

#### **Step 5. Support Actions in Year 1.**

**Activity 4.1.1. MoUs formalized.** Memoranda of understanding have been prepared and signed by the two partners (SG2000 and Kaduna State ADP) leading dissemination activities.

**Activity 4.4.3. Extension events conducted.** Mid-season and end-of season evaluations will be conducted for each demonstration. In addition, 13 farmer field days (one in each Local Government Area) will be conducted, built around BNF technologies.

**Activity 4.4.4. Mass media events organized.** The project's activities will continually be covered by both print and electronic media. Local TV and radio stations will periodically be engaged to develop documentary programmes around N2Africa project activities. In addition, short plays developed around BNF activities will be submitted to the Canadian organization, Farm Radio.



**Activity 4.5.3. Special events on women's grain legume enterprise conducted.** The project will closely collaborate with the Women in Agriculture (WIA) section of the State ADPs and the Women Farmers Association of Nigeria (WOFAN) to organize a women's network among N2Africa partners. Members of this network will be expected to develop and conduct activities that have focus on women's participation along the entire value chain of grain legume enterprise. Sensitisation and mobilization of women in some of the action sites have already started.

**Step 6. Anticipated activities in Years 2, 3 & 4.** In the following years, the remaining activities and milestones in Table 2 will be addressed as follows:

**Activity 4.1.2. Co-funding/financing options identified.** Farmers participating in the project will be organized to enable them to benefit from various microfinance and loan concession programmes in the country. Avenues will be explored for the development of collaborative proposals with project partners especially in processing and marketing of grain legumes, incorporation of livestock component, and the involvement of marginalized groups in production, processing and marketing of grain legumes. Possible funding to support graduate study in inoculant market development will also be explored and vigorously pursued.

**Activity 4.1.3. Satellite sites established.** The initial action sites were selected on the basis of strong likelihood of impact on both the immediate and neighbouring communities. It is, therefore, expected that in the second and subsequent years, satellite sites will be selected among these neighbouring communities for scaling up. Additional communities from neighbouring states of Jigawa, Katsina and Niger will be explored as opportunities arise.

**Activity 4.2.1. Dissemination tools developed.** The technology dissemination tools developed in preparation for the 2010 rainy season will be refined over the next year and information materials built around them. A critical dissemination tool that is anticipated in the following years is the development of a grain legume enterprise package developed in collaboration with the private sector (e.g. Crystalizer Nig Ltd., Bicco Agroproducts etc) that is intended for 1000 m<sup>2</sup> and extended on credit to farmer associations and local middlemen.

**Activity 4.3.2. Seed production initiated.** Small scale seed producers under the TL-II and SS-KKM projects abound within and in close proximity to the mandate areas. There are also about 5 AGRA grantees within the seed sector that are within the mandate areas. Seeds for dissemination activities were, therefore, procured largely from these sources and plans will be put in place to scale up collaboration with these seed partners during the duration of the project. The project will partner with certified community seed producers to ensure secure seed source. However, where seeds of a particular variety are not sufficient to meet demand, as is currently the case with groundnut variety ACIAR 19BT, seed multiplication will be organized to meet the shortfall. The project could provide farmer groups engaged in grain legume seed production with P fertilizer and rhizobial inoculant as an incentive.

**Activity 4.3.3. Market outlets established.** Cowpea, groundnut and soybeans are readily marketed through existing channels, local markets, local institutions and wholesale buyers. However, it is expected that increased production of these crops in the following years of the project will result in large output that may require new market channels. The project will closely partner with market initiatives, such as those of AGRA and USAID MARKETS to ensure that farmers are linked to secure markets.

**Activity 4.3.4. Legume processing established.** The impact of value addition activities centred on cowpea, groundnut and soybean is obvious within the mandate areas. Local snacks, such as 'akara', developed from cowpea, and 'awara', developed from soybean, are commonly hawked along major streets and neighbourhoods of most communities in the mandate areas. Nonetheless, such value addition enterprises will be introduced to communities that are not conversant with them. In addition, new recipes and processing methods will be explored where opportunities exist.

**Activity 4.5.1. Gender analysis.** A draft ToR for gender specialist has been developed and circulated among project members. The plan is to advertise this position. The identified consultant will



develop tools (questionnaires) for surveys that will be conducted in all 8 project countries or selected countries per hub. The questionnaire will be returned to the consultant for analysis, desk survey and report writing. This report will be synthesized and used to formulate N2Africa strategies to ensure gender mainstreaming in N2Africa activities.

**Activity 4.5.2. Annual gender reporting.** Records are being kept concerning gender participation in all activities.





## 6. Country-specific implementation plan: Ghana.

Dissemination of legume and inoculant technologies is being conducted by the trained extension agents supplied by three NGOs and supported by extension agents from the Ministry of Food and Agriculture (MoFA). The three NGOs are UrbNet, Association of Church Development Programmes (ACDEP), and UpperwestAgro. The lead farmers are expected to assist the extension agents. These organizations work with farmers at the grassroots and have the capacity to directly engage 27,000 farm households.

**Step 1: Participation.** The implementation plan for Ghana was developed at the National Planning Meeting which took place on 26-27 April 2010. Over 30 representatives of grassroots organizations, research institutes, universities, input dealers and other potential partners attended the two-day workshop at the Modern City Hotel in Tamale, Ghana to present cooperators, expectations and opportunities for collaboration with N2Africa in Northern Ghana and to decide on tasks, proposed activities and time frame for the 2010 rainy season. The list of participants is indicated in Table 13 below:



**Table 13: Participant list representing other organizations during the planning meeting in Ghana**

Sn	Name	Title	Qualification	Institute	Address	Profession
1	Joseph Nichor	Mr.	BSc	ACDEP	P.O. Box 1411, Tamale	Programme facilitator
2	Alhaj A.R.Z Salifu	Mr.	MPhil	MOFA	P. O. Box 3, Bolgatanga	Agriculturalist
3	Roger Kanton	Dr.	PhD	SARI	Managa station, P. O. Box 46	Agronomist
4	James M. Kombiok	Dr.	PhD	SARI	SARI, P. O. Box 52, Tamale	Agronomist
5	Alexander N. Wiredu	Mr	MPhil	SARI	SARI, P. O. Box 52, Tamale	Researcher
6	Issahaku I. Wumpini	Mr	-	Agro inputs	Gaidu P.O. Box 381, Tamale	seller
7	Emmanuel D. Eledi	Mr	MSc	MOFA	P.O. Box 21, Wa	Agriculturist
8	Bakang J.A.	Dr	PhD	KNUST	KNUST, Kumasi	Snr Lecture
9	Robert Aidoo	Mr	MSc	KNUST	KNUST, Kumasi	Lecture
10	Ohene-Yankyera	Dr	PhD	KNUST	KNUST, Kumasi	Snr Lecture
11	Stella Ennin	Dr	PhD	CRI	P.O. Box 3785, Kumasi	Agronomist
12	Suglo M.Y.B	Mr	BSc	MOFA	P.O.Box 21, Wa	Agriculturist
13	Partick Ofori	Mr	MSc	SRI	Kwadoso, Kumasi	Research scientist
14	Tetteh F.M.	Dr	PhD	SRI	Kwadoso, Kumasi	Soil scientist
15	Francis Banka	Dr	MD	UWAI	Box 619, Wa	Entrepreneur
16	Benjamin Ahiabor	Dr	PhD	SARI	P.O. Box 52	Soil Scientist
17	Naab J.B.	Dr	PhD	SARI	P.O. Box 494	Soil Scientist
18	Jibreel Mohammed Basit	Mr	BSc	UrbAnet	P.O. Box 1595	Development worker
19	Zakaria Rashid	Mr	MBA	UrbAnet	P.O.Box 1595, Tamale	Development worker
20	Hakeem Ajeigbe	Dr	PhD	IITA	Ulongwe , Malawi	Agronomist
21	Abdullahi Bala	Dr	PhD	IITA	PMB 3112 Kano, Nigeria	Scientist
22	Kambonga Thomas	Mr	Mphil	MOFA	P.O.Box 23, Bongo	Extensionist
23	Marie Rarieya	Dr	PhD	AGRA	PMB KIA 114, Airport Accra	Scientist
24	Kenton Dashiell	Dr	PhD	CIAT TSBF	Nairobi, Kenya	Agronomist
25	Edward Charles	Mr.	-	GAIDA	P.O.Box 1882, Nyamkpala	Inputs dealer
26	Judith de Wolf	Dr.	PhD	CIAT TSBF	Harare Zimbabwe	M&E scientist
27	Robert Abaidoo	Prof	PhD	KNUST	KNUST, Kumasi	Soil microbiologist
28	Stephen Nutsugah	Dr	PhD	SARI	P.O.BOX 52, Tamale	Plant Pathologist
29	Andrews Opoku	Mr	MSc	KNUST	KNUST Kumasi	Soil scientist
30	Diana Ndego	Ms	BA	SEND Ghana	P.O.Box TL, 341, Tamale	Development worker
31	Alhassan John Issah	Mr	MA	CSP-SFP	P.O.Box TL, 341, Tamale	Educationist
32	Nicholas Denwar	Mr	Mphil	SARI	P.O.BOX 52, Tamale	Plant breeder
33	Frederick Baijukye	Dr	PhD	CIAT-TSBF	P.O.Box 93, Maseno, Kenya	Soil scientist
34	Saidou Koala	Dr	PhD	CIAT-TSBF	P.O.Box 823, Nairobi Kenya	Soil scientist



**Step 2: Inputs Secured.** Procurement of seeds, inoculants, adhesives and fertilizers is being organized as follows:

**Seed:** About 1.2 t of soybean seeds, 720 kg of groundnut and 490 kg of cowpea are required for the dissemination activities of the 2010 rainy season. Soybean varieties Anidaso, Salentuya 1, Jenguma, Quarshie and TGX 1834-2E have been recommended for dissemination. However, it was observed that some of the varieties suggested may be outdated; thus, more discussion is required on the range of varieties to use. Cowpea varieties to be used are 'Apagbala', 'Brown\_eye', 'Bengpla', 'Bawutawuta' and 'Omondoo', while 'Chinese', 'Manipinta' and 'Nkatiesari' are the groundnut varieties to be disseminated.

Seeds will be procured from certified agro-dealers within the 3 regions of the project operation. In Northern Region, seeds will be procured from an AGRA seed producer grantee, Savanna Seeds Tamale, while the seed supplier in Upper West will be 'Antika Enterprise'.

**Inoculant:** About 6 kg of rhizobial inoculants is required for soybean. Rhizobial inoculants for dissemination and adaptive trials in Year 1 will have to be imported since there are no companies in Ghana that are engaged in local production. Inoculants for soybean will be purchased from LegumeFix, UK. Inoculants will be given to farmers free of charge in the initial phase of the project.

**Adhesive:** It is expected that the imported inoculants will be provided with their stickers. If, however, that is not the case, gum arabic that is sufficient to prepare 16% solution for seed treatment will be procured.

**Fertilizers:** A total of 115 50 kg bags of SSP will be required for Year 1 dissemination activities. Fertiliser will be purchased from IFDC-certified agro-input dealers and repackaged into 1 kg plastic bags to be given to farmers. Information on the relative locations of these certified dealers in the mandate areas will be obtained from IFDC Ghana.

**Step 3: Field protocols developed.** Field protocols will be developed and materials assembled for legume enterprise (one each for cowpea, groundnut and soybean). The protocol will describe "best practice" legume management technologies for cowpea, groundnut and soybean, inoculated and not inoculated (for soybean), with each demonstration packaged into a 20 liter bucket. Sixty seven (67) of these demonstrations will be prepared for soybean; twenty seven (27) for cowpea and forty (40) for groundnut and will be distributed in 2 districts in each of Northern, Upper East and Upper West Regions. Fifteen (15) satellite farmers will be provided with "take-away" kits from each demonstration. These "take-away" kits will consist of 1 kg (inoculated or uninoculated for soybean) of one of the several varieties being extended at each action site, 1 kg of SSP fertilizer and instructions translated into the local language. Report forms will also be developed to formalize information collected from these demonstrations.

**Step 4: Technologies Deployed.** The outreach effort will establish a total of 134 demonstrations and provide 2134 farm households. (800 in Northern Region, 656 in Upper West and 688 in Upper East) with BNF technology test packages intended for 200 m<sup>2</sup>. These 56 ha of cowpea, groundnut and soybeans are expected to produce 102 t of grains that fix 1,923 kg of N.

#### **Step 5. Support Actions in Year 1.**

**Activity 4.1.1. MoUs formalized.** Memoranda of understanding will be signed with each partner. Agreements will be activity-based and will be signed before the commencement of activities.

**Activity 4.4.3. Extension events conducted.** Mid-season and end-of season evaluations will be conducted for each demonstration. In addition, 6 farmer field days (one in each district) will be conducted, built around BNF technologies.

**Activity 4.4.4. Mass media events organized.** The project's activities will continually be covered by both print and electronic media. Local TV and radio stations will periodically be engaged to develop documentary programmes around N2Africa project activities. In addition, short plays developed around BNF activities will be submitted to the Canadian organization, 'Farm Radio', for airing.



**Activity 4.5.3. Special events on women's grain legume enterprise conducted.** The project will closely collaborate with the grassroots organization and MoFA to organize a women's network among N2Africa partners. Members of this network will be expected to develop and conduct activities that have focus on women's participation along the entire value chain of grain legume enterprise, especially in value addition and household nutrition activities.

**Step 6. Anticipated activities in Years 2, 3 & 4.** In the following years, the remaining activities and milestones in Table 2 will be addressed as follows:

**Activity 4.1.2. Co-funding/financing options identified.** Farmers participating in the project will be organized to enable them to benefit from various microfinance and loan concession programmes in the country. Avenues will be explored for the development of collaborative proposals with project partners especially in processing and marketing of grain legumes, incorporation of livestock component, and the involvement of marginalized groups in production, processing and marketing of grain legumes. Possible funding to support graduate study in inoculant market development will also be explored and vigorously pursued.

**Activity 4.1.3. Satellite sites established.** The initial action sites were selected on the basis of strong likelihood of impact on both the immediate and neighbouring communities. It is, therefore, expected that in the second and subsequent years, satellite sites will be selected among these neighbouring communities for scaling up.

**Activity 4.2.1. Dissemination tools developed.** The technology dissemination tools developed in preparation for the 2010 rainy season will be refined over the next year and information materials built around them. A critical dissemination tool that is anticipated in the following years is the development of a grain legume enterprise package developed in collaboration with the private sector that is intended for 1000 m<sup>2</sup> and extended on credit to farmer associations and local middlemen.

**Activity 4.3.2. Seed production initiated.** There are already 2 AGRA grantees within the seed sector that are within the mandate areas. These are Savanna Seeds in Tamale, Northern Region, and Antika Enterprise in Wa, Upper West Region. It is, therefore, expected that some of the seeds for dissemination activities will be procured from these sources during the duration of the project. The project will partner AGRA's Seed Production and Dissemination programme to organize community seed producers and seed enterprise within the context of the project. The project could provide farmer groups engaged in grain legume seed production with P fertilizer and rhizobial inoculant as an incentive.

**Activity 4.3.3. Market outlets established.** Cowpea, groundnut and soybeans are readily marketed through existing channels, local markets, local institutions and wholesale buyers. However, it is expected that increased production of these crops in the following years of the project will result in large output that may require new market channels. The project will closely partner with market initiatives, such as those of AGRA, to ensure that farmers are linked to secure markets.

**Activity 4.3.4. Legume processing established.** The impact of value addition activities centred on cowpea and groundnut is obvious within the mandate areas. Various recipes, including a range of soups and snacks, are commonly available in the mandate areas. Local snacks, such as 'akara', developed from cowpea, and 'awara', developed from soybean, are some of the value addition enterprises that will be introduced to communities that are not conversant with them. In addition, new recipes and processing methods will be explored where opportunities exist.

**Activity 4.5.1. Gender analysis.** A draft ToR for gender specialist has been developed and circulated among project members. The plan is to advertise this position. The identified consultant will develop tools (questionnaires) for surveys that will be conducted in all 8 project countries or selected countries per hub. The questionnaire will be returned to the consultant for analysis, desk survey and report writing. This report will be synthesized and used to formulate N2Africa strategies to ensure gender mainstreaming in N2Africa activities.

**Activity 4.5.2. Annual gender reporting.** Records are being kept concerning gender participation in all activities.



## 7. Country-specific implementation plan: Malawi.

### Step 1: Participation.

Initial meetings were held separately with representatives of NASFAM, ASMAG, FUM, World Vision Malawi, Africare Malawi, Clinton Hunter Development Initiative, Bunda College, DARS, and DAES of the Ministry of Agriculture and Food Security in Malawi. The project was introduced to them individually and they all showed their willingness to collaborate with the project. The organizations, contacts and contact details of these participants appear in Table 14. These organizations have the capacity to directly engage over 300,000 farm households.

**Table 14: Contact information for organizations in Malawi that may work on the N2Africa project**

Organization	Contact	Area of operation
Bunda College	Dr Patson Navilta	Ekwendeni, Kasungu, Lilongwe
Bunda College	Prof George Kanyama-Phiri	""
Bunda College	Dr Sieglinde Snapp	""
Bunda College	Dr Agnes M. Mwangwela	""
Farmer Union of Malawi	Mr Prince Kapondamgaga	All districts
Africare Malawi	Maggie Mzungu	""
Clinton Foundation	Austin Ngwira	Mchinji, Lilongwe
World Vision	Dosaya Kalunga	
ASMAG (Association of Small Holder Seed Multiplication Group)	Nelson Nyama	All districts
NASFAM (National Association of Small Scale Farmers of Malawi)	Richard	""
Ministry of Agriculture and Food Security	Dr Grace Malindi, Director of Agriculture and Extension Services	""
Ministry of Agriculture and Food Security	Dr Alfred P. Mtukuso, Director of Agriculture Research Services	""
Department of Agricultural Research Services Chitedze Research Station	Mr. Lloyd Chipiliro Siyani Liwimbi	Lilongwe
Chitedze Research Station	Dr G. Kananji	""

The N2Africa Malawi country planning meeting was held on 10<sup>th</sup> and 11<sup>th</sup> June 2010 in Crossroad Hotel, Lilongwe. The meeting attracted over 40 participants including the controller of Agriculture, Extension and Technical Services as well as 2 Directors. Several NGOs, scientists and lecturers from the University and farmer representatives were also present (Appendix 1). Malawi like the other Southern Africa countries will effectively have three planting seasons instead of four since the raining season starts in November/December. Therefore the meeting Project recommended that the expected number of farmers in the first and second year should be reached in the coming season.



This proposal was accepted by all partners. In view of the above the project will directly work with 2800 farmers in crop production activities. In addition a number of women would be targeted in value addition and household nutrition activities. A total of 175 demonstrations made up of 64 demonstrations for soybean, 8 for cowpea, 56 for groundnut and 47 for common bean were agreed on during the Malawi planning meeting of the project. The numbers of demonstrations per crop, extension agents that would be involved, number of target communities and farmers are given in Table 15. The dissemination and extension activities include community mobilization and group sensitization, agronomic and post harvest trainings and agronomic technology demonstrations, large and mini farmer field days, media campaigns and market linkages.

**Table 15: Number of demonstrations per crop, extension agents needed, communities and farmers in Malawi, 2010/2011 planting season**

District	Number of Demonstrations								Total number of farmers
	Soybean	Cowpea	Groundnut	Bean	Total	AEDO/ No EAs*	Section**	Farmers	
Lilongwe	12	1	14	8	35	7	7	525	560
Dowa	15		10	10	35	7	7	525	560
Ntcheu	10		5	15	30	6	6	450	480
Salima	7	6	7	0	20	4	4	300	320
Mchinji	10	1	10	9	30	6	6	450	480
Kasungu	10		10	5	25	5	5	375	400
<b>Total</b>	<b>64</b>	<b>8</b>	<b>56</b>	<b>47</b>	<b>175</b>	<b>35</b>	<b>35</b>	<b>2625</b>	<b>2800</b>

\*EAs: Extension agents equivalent to AEDO (Agricultural Extension Development Officer)

\*\*Section, section is a close community

## Capacity building

### Training of Trainers/Local Trainings

Four senior extension agents (1 male and 3 female) participated in the Training of trainers organized by the project from 24<sup>th</sup> to 28<sup>th</sup> May 2010, in Kisumu, Kenya. The four trainees in collaboration with the hub office will organize the training of 40 extension agents and 70 Lead farmers from the 35 sections/communities in the 6 participating districts. This equates to 2 master farmers (1 male and 1 female) and 1 extension agent per section. The remaining 5 extension agents would be filled by other partners (eg WALA) who have signified their intention to link up with the project and perform similar activities in non project areas. The Department of Agricultural Extension Services (DAES) will lead and collaborate with all partners in these trainings while N2Africa hub office and NASFAM will provide technical backup. Agreement to this effect is being worked out. The DAES will also lead in the implementation of household nutrition and food processing activities with support from Food Nutritionist of Bunda College and facilitation by the project. The EAs trained will in turn, conduct on-farm trainings in their different sections with assistance of the two farmers trained per section and they will train all the lead farmers who will also train an average of 15 farmers (group members) per trainee. This will lead to a total of above 2800 farmers trained in the 2010/211 cropping season.

Expected topics include:

1. Objectives and expectations of N2Africa
2. Legumes, nitrogen and rhizobia
3. Legume based cropping systems
4. Inoculants and inoculation (handling and use)
5. Practical demonstration of inoculation (handling and use)
6. Demo plot layouts and data collection (practical)
7. Expectation from farmer groups and lead farmers
8. Mid season and end of season evaluations
9. Post harvest handling





**Table 16: Tentative ToT schedule in Malawi**

No	Date	Location	Expected no of trainees	Key Linkage	Key Partner
1	14 <sup>th</sup> Sept 2010	Salima ADD	12	Agnes Manchichi and James Mnjerema	DARS
2	15 <sup>th</sup> Sept 2010	Dowa	21	Agnes Manchichi and James Mnjerema	World Vision
3	16 <sup>th</sup> Sept 2010	Ntcheu	21	Agnes Manchichi and James Mnjerema	Africare
4	21 <sup>st</sup> Sept 2010	Lilongwe ADD	23	Esnart Nyerenda and Esnat Kayenda	NASFAM
5	22 <sup>nd</sup> Sept 2010	Kasungu ADD	15	Esnart Nyerenda and Esnat Kayenda	CRS
6	23 <sup>rd</sup> Sept 2010	Mchinji	18	Esnart Nyerenda and Esnat Kayenda	CHIDI
			110		

**Training Post harvest (storage, drying etc)**

This will be conducted during the TOT schedule for September (Table 16)

**Building Partnership**

The project's major partners in the implementation of the dissemination and extension activities and the number of sections (communities) they will be covering are given in Table 17. Some other partners are implementing activities across the 6 districts. DAES will lead in the training activities in all the 6 districts. Seed-co will provide most of seed required, DARS and IITA will provide breeder seed where ever needed, and ASMAG will provide linkages for input and output market. Gender specialist in Bunda College will provide technical backstopping to DAES on specialized activities targeting women. Technical backstopping and dissemination materials will be provided by the project. To ensure uniform quality, quality control and price discounts, major inputs like fertilizer will be accessed through Seed-co and ASMAG by the hub office. The main partner in-charge of the different districts will help in identifying participating communities and farmer groups as well as forming groups in sections where they are not available in consultation with the DAES and N2Africa to reflect different levels of market access and production potential. The inoculants that will be used in all the demonstration fields will be imported by N2Africa.

**Table 17: Major N2Africa partners in Malawi and their area of coverage in the project**

District	Main Partner	Section
Lilongwe	NASFAM/DAES	7
Dowa	World Vision	7
Ntcheu	World Vision	6
Salima	DARS/DAES	4
Mchinji	CHDI	6
Kasungu	CRS	5
<b>Other Activities</b>		
Trainings	DAES	
Gender	Bunda/DAES	
Certified seeds	Seed-co/ASMAG	
Soil Analysis	Bunda College	
Inoculants	Hub office	



Other Input	ASMAG/NASFAM	
Nutrition	DAES/Africare/Bunda	
Marketing	ASMAG/NASFAM/FU	

### Step 2: Inputs secured.

**Seed.** ASMAG reported that seed producers have planted seeds of improved varieties of soybean, groundnut and bean and this can be made available to N2Africa on request. Dr Kananji is contacting seed producers developed in collaboration with ASMAG in the TL-II project for improved seeds of soybean, groundnut and bean.

**Inoculant.** In the first year inoculants will be sourced from Zimbabwe. This will be finalized in collaboration with other project members. A meeting is expected in Zimbabwe on 13<sup>th</sup> and 14<sup>th</sup> April when this issue will also be raised with partners in Zimbabwe.

**Fertilizers.** In collaboration with Farmers Union of Malawi and ASMAG fertilizer would be sourced in Optichem, Yara, SFRF, and ARO. 5 and 10 kg packs possible and would be encouraged.

The inputs needed are given in Table 18. A total of 3181 kg of seed comprising of 1216 kg of Soybean seed, 140 kg of cowpea, 1064 kg of groundnut seeds and 762 kg of bean seed would be needed for the demonstration and dissemination activities. Other inputs include over 15 tons of fertilizer (Super-D), 34 lt of insecticide, fungicide valued at US\$ 34, and 608 g of inoculants.

**Table 18: Inputs for Technology Dissemination Activities in Malawi 2010/2011**

Inputs	Soybean	Cowpea	Groundnut	Bean	Total
Number of demos	64	8	56	47	175
Number of farmers	1024	128	896	752	2800
Total land area (ha)	24.32	5.6	21.28	25.38	77
*Seed needed (kg)	1945.6	140	1064	1776.6	3181
**Fertilizer (kg)	4864	1120	4256	5076	15316
Fertilizer (bag)	97.28	22.4	85.12	101.52	306
Insecticide (l)	26.32	7.6	0	0	34
***Inoculum (g)	608	0	0	0	61

\*Seed rate: Soybean 50 kg/ha, cowpea 25 kg/ha, groundnut 50 kg/ha and bean 30 kg/ha

\*\*Fertilizer 200 kg/ha

\*\*\*Inoculum 1 g/kg seed, half of the seed will be inoculated

### Step 3: Field protocols developed, Supervision and Data Collection

Field protocols have been developed and shared with partners for comments. The day to day supervision of crop production activities and data collection will be done by the trained extension agents from the partner organizations in charge of the respective sections. The lead farmers (master farmer) are expected to assist the extension agents. Staff from the N2Africa will also monitor activities and give some supervision. The partnering organizations in charge of the various districts can seek assistance of the project staff and other resources in country as well as the Southern Africa hub office to facilitate activities as the need arises.

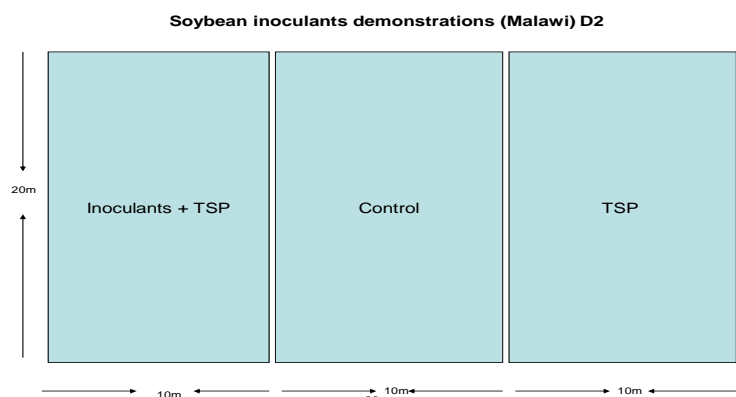
### Step 4: Technologies deployed.

#### Demonstration plots

The technologies and varieties that would be included in the demo plots are given in Table 19. The lists given in Table 19 are not exhaustive. The project has had fantastic cooperation from TL-II partners, Seed-co and ASMAG who have assured the project of seed supply and therefore the project may not need to set up seed producers, however if in the course of implementation we receive feedback from some communities with respect to seed access the project may decide to set up community seed production in those communities and link them with other seed producers. Each demo plot will be 20m x 30m (600 m<sup>2</sup>) with maximum of 2 new treatments to compare with a traditional control. A template demo plot layout is given in Figure 3.



**Figure 3: N2Africa Demo plot layout**



Log book and plot layout will accompany the inputs.

**Table 19: Technologies and crop varieties in demonstrations**

Crop	Technologies	Varieties
Soybean	Inoculants	Makwacha, Nasoko, Ocepara-4,
	Varieties	
	Planting date	
	Fertilizer	
	Insecticide spray	
Groundnut	Planting date	Chalimbana-2005, Nsinjiro, CG7, Chikala, Kakoma
	Varieties	
	Fertilizer	
Bean	Varieties	Napilira, Maluwa, Kholophere
	Fertilizer	
Cowpea	Planting pattern	Sudan-1, IT81E-16
	Planting date	
	Varieties	

**Step 5. Support Actions in Year 1**

**Activity 4.1.1. MoUs formalized.** Draft MoUs for the implementation exercise have been sent to all partners for their input. The MoUs will be formalized and funds disbursed before beginning of the rains.

**Activity 4.4.3. Extension events conducted**

**Other Extension and Dissemination Activities**

**Training Nutrition and food processing demonstration**

These trainings will be conducted in the middle of the rainy season if grains are available or after harvest if sufficient grains are not available. The trainings are intended to demonstrate to the small holder farmers especially the women farmers, the nutritional importance and house hold uses of these legumes. Several recipes of these legumes would be demonstrated and the women would be trained on the preparation of these recipes. Efforts are under way to publish manuals of recipes of cowpea, soybean, groundnut and common bean which would be used during the trainings. The Home Economics and Nutrition Unit of the Department of Agric Extension Services and the Department of Home Economics and Human Nutrition of Bunda College of Agriculture are involved so also Africare. Consultation will continue to identify the right partner(s) to lead this activity.



**Activity 4.4.4. Mass media events organized**

**Media campaigns (radio, TV, bulletin, Information centre etc)**

We will organize 4 mass media campaigns during the planting season specifically when the crops are podding, at harvest and during the food nutrition trainings. The project will link up with Farm Voice Radio (FVR) to disseminate information through the radio stations in Malawi.

**Field days/mid season and end season**

One major field day will be conducted in each of the districts and mid-season and end of season evaluations would also be conducted on at least 50% of demo plots. Mid-season and end of season evaluation will be conducted. Internal monitoring and evaluation is an important element in this extension method.

**Activity 4.5.3. Special events on women's grain legume enterprise conducted.**

**Gender analysis in relation to specific legumes, labor, and household and market preferences documented**

A draft ToR for gender specialist has been developed and circulated among project members. The plan is to advertise this position. The identified consultant will develop tools (questionnaires) for surveys that will be conducted in all 8 project countries or selected countries per hub. The questionnaire will be returned to the consultant for analysis, desk survey and report writing. This report will be synthesized and used to formulate N2Africa strategies to ensure gender mainstreaming in N2Africa activities.



## 8. Country-specific implementation plan: Mozambique.

### Step 1: Participation.

Dr Steve Boahen of IITA, Nampula will coordinate N2Africa activities in Mozambique. Dr Calisto Bias, the Director General of IIAM has indicated his strong interest in collaboration with N2Africa so also is Dr Mario Falcao the Dean of the Faculty of Agronomy and Forestry at Eduardo Mondlane University in Maputo. The main extension partners will be CLUSA and Technoserve who are both based in Nampula. Luis Pereira of Technoserve will lead dissemination activities and has a business model that involves companies already engaged in contract farming for cotton and other crops.

The N2Africa Mozambique country planning meeting was held on 17<sup>th</sup> and 18<sup>th</sup> June 2010 in Hotel Milenio, Nampula. About 30 participants (**Appendix 2**) were present in the 2 day meeting which was officially declared opened by the Director of Natural Resources Management, IIAM-Maputo. Mozambique like the other Southern Africa countries will effectively have three planting seasons instead of four since the raining season starts in November/December. The meeting proposed reaching 1280 farmers in the 2010/2011 cropping season (Table 20). A total of 80 demonstrations made up of 55 demonstrations for soybean, and 25 for groundnut would be conducted. The numbers of demonstrations per crop, extension agents that would be involved, number of target communities and farmers are given in Table 1. In addition 10 farmers would be selected per district; each of these farmers will receive 5 kg of seed and enough fertilizer for seed multiplication especially of the newly released soybean varieties. This activity will be led by IKURU who will also provide market linkages for the seed.

**Table 20: Number of demonstrations per crop, extension agents needed, communities and farmers in Mozambique, 2010/2011 planting season**

Province	District	Number of Demonstration					**Total number of farmers
		Soybean	Groundnut	Total	*No EAs	Farmers	
Zambesia	Gurue	15	0	15	3	225	240
Manica	Sussundenga	15	2	17	3	255	272
Tete	Angonia	15	0	15	3	225	240
Nampula	Mogovolas	0	18	18	3	270	288
Niassa	Mandimba	10	5	15	3	225	240
	<b>Total</b>	<b>55</b>	<b>25</b>	<b>80</b>	<b>15</b>	<b>1200</b>	<b>1280</b>

\*EAs: Extension agents/technicians, each EA is in charge of 5 to 6 demos/lead farmers

\*\*Total number of farmers: 1 lead farmer plus 15 group members

### Capacity building

#### Training of Trainers/Local Trainings

Two senior extension agents (1 male and 1 female) from Mozambique participated in the Training of trainers organized by the project from 24<sup>th</sup> to 28<sup>th</sup> May 2010, in Kisumu Kenya. The two trainees in collaboration with the hub office will organize the training of 4 research technicians 16 extension agents and 15 Lead farmers from the 5 participating districts. They will organize an extension workshop and train 100 farmers. A total of 115 farmers will then train 1500 farmers. Dates of the various training will be finalized in due course.

Expected topic includes:

1. Objectives and expectations of N2Africa
2. Legumes, nitrogen and rhizobia
3. Legume based cropping systems
4. Inoculants and inoculation (handling and use)
5. Practical demonstration of inoculation (handling and use)
6. Demo plot layouts and data collection (practical)
7. Expectation from farmer groups and lead/master farmers



- 8. Mid season and end of season evaluations
- 9. Post harvest handling

**Training Post harvest (storage, drying etc)**

This will be conducted during the TOT scheduled for September.

**Building Partnership**

The major partners who will be involved in the implementation of the dissemination and extension components within the districts are given in Table 21. IIAM will lead the training activities in all the districts. IKURU will provide bulk of seed required, IIAM and IITA will provide breeder seed where ever needed. Partners in-charge of the various districts will help in identifying participating communities and farmer groups. In consultation with N2Africa project leaders, partners may form groups in communities where they are not available to reflect different market access and production potential. The inoculants that will be used in the entire demo will be imported by N2Africa.

**Table 21: Major N2Africa partners in Mozambique and their area of coverage in the project**

Province	District	Partners
Zambesia	Gurue	CLUSA
Manica	Susudenga	IIAM
Tete	Angonia	CLUSA
Nampula	Mogovolas	IIAM
Niassa	Mandimba	SAN
	<b>Other activities</b>	
	Nutrition training	CLUSA/IITA
	Agronomy training	IIAM
	Agro-dealer training	IIAM
	Agro-Inputs	IKURU
	Marketing	Technoserve soybean value chain
	Seed production	IKURU, TL-II

**Step 2: Inputs secured**

**Seed:** IKURU and IITA

**Inoculant:** Inoculants will be sourced from Zimbabwe for the first year of the project.

**Fertilizers:** IKURU

The inputs needed for demonstrations are given in Table 22. A total of 2147 kg of seed comprising of 1672 kg of Soybean seed, and 475 kg of groundnut seeds will be required for the demonstration and dissemination activities. Other inputs include over 4.5 tons of fertilizer, twenty-three liters of insecticides, and 836 g of inoculants.

**Table 22: Inputs for Dissemination Activities in Mozambique 2010/2011**

Inputs	Soybean	Groundnut	Total
Number of demo	55	25	80
Number of farmers	880	400	1280
land (ha)	20.9	9.5	30
*Seed needed (kg)	1672	475	2147





**Fertilizer (kg)	3135	1425	4560
Fertilizer (bag)	62.7	28.5	91
Insecticide (l)	22.9	0	23
***Inoculum (g)	836	0	84

\*Seed rate: Soybean 80 kg/ha, cowpea 25 kg/ha, groundnut 50 kg/ha and bean 30 kg/ha

\*\*Fertilizer 200 kg/ha

\*\*\*Inoculum 1 g/kg seed, half of the soybean seed would be inoculated

### Step 3: Field protocols developed

#### Demonstration plots

The technologies and varieties that would be included in the demo plots are given in Table 23. Each demo plot will be 20 m x 30 m (600 m<sup>2</sup>) in size with maximum of 3 treatments (2 improved treatments to compare with a traditional control) each of 20m x 10 m (200 m<sup>2</sup>) in size or occasional 2 treatments, each 20 m x 10 m (300 m<sup>2</sup>) in size. Plot layouts including field log books will accompany the inputs. During the planning meetings there were indications that some farmers may be interested in cultivation of large areas. These farmers will be assisted to source improved seeds and inoculants. In addition to the demonstrations the project will facilitate seed production of 5 newly pre-released soybean varieties. This will be implemented through IKURU who will link up with 10 farmers per district to produce seed as well as facilitate the marketing of seeds. Partners are encouraged to adopt proven extension methods in addition to the extension method design by the N2Africa; however this should be documented to allow for comparison and up scaling.

**Table 23: Technologies and crop varieties in demonstrations**

Crop	Technologies	Varieties
Soybean	Inoculants	5 newly pre-released varieties to be supplied by IITA with Storm or Santa as control
	Varieties	
	Planting date	
	Fertilizer	
Groundnut	Varieties	JL24, Nametil, CG7
	Fertilizer (Ca and P)	
	Fertilizer	Cal (IKURU), SSP/TSP

### Step 4: Technologies deployed

#### Supervision and Data Collection

The day to day supervision of crop production activities and data collection will be done by the trained extension agents from the partner organizations in charge of the respective sections. The lead farmers are expected to assist the extension agents. The partnering organizations in charge of the various districts can seek assistance of the project staff and other resources in the country as well as the Southern Africa hub office to facilitate activities as the need arises.

### Step 5. Support Actions in Year 1

#### Activity 4.1.1. MoUs formalized.

The dissemination plan based on the country planning meetings has been circulated among partners for their inputs. This will be reviewed and form basis of MoUs with partners.

#### Activity 4.4.3. Extension events conducted Other Extension and Dissemination Activities

An internal monitoring and evaluation is enshrined in the extension method through the mid-season and end of season evaluations that will be conducted. These events will allow for feedbacks from farmers and help to improve implementation in the following season. One major field day will be conducted in each of the 5 districts and mid-season and end of season evaluations will also be conducted on at least 50% of demo plots



**Activity 4.4.4. Mass media events organized Media campaigns (radio, TV, bulletin, Information centre etc)**

We will organize 4 mass media campaigns during the planting season specifically when the crops are podding, at harvest and during the processing and nutrition training period.

**Activity 4.5.3. Special events on women's grain legume enterprise conducted Training and demonstration on Nutrition and food processing**

In addition to the technology demonstrations, a number of women would be targeted in value addition and household nutrition activities. These trainings will be conducted at the end of the growing season when farmers complete harvesting. The trainings are intended to demonstrate to the small holder farmers especially the women farmers, the nutritional importance and house hold uses of these legumes. Several recipes of these legumes will be demonstrated and the women will be trained on the preparation of these recipes. Efforts are under way to publish manuals of recipes of cowpea, soybean, groundnut and common bean which will be used during the trainings. IITA Food Technologist based in Nampula will consult with partner(s) to identify a lead partner for this activity.



## 9. Country-specific implementation plan: Zimbabwe.

### Step 1: Participation.

The N2Africa project has been introduced to partners from the University of Zimbabwe, the Department of Research & Specialist Services (DR&SS) at the highest level through the Vice-Chancellor of the University and the Directors of DR&SS.

The N2Africa Zimbabwe country planning meeting was held on 14-15 June 2010, St. Lucia Park Training Centre, Harare. Over 40 participants attended the 2 day meetings. These include several lecturers and scientist from the University and National Research Institutes. Also present were representatives of NGOs, seed companies, farmer groups and members of business community. Zimbabwe like the other Southern Africa countries will effectively have three planting seasons instead of four since the raining season starts in November/December. The meeting proposed reaching 2560 farmers in the 2010/2011 cropping season (Table 24). In addition a number of women would be targeted in value addition and household nutrition activities. A total of 160 demonstrations made up of 50 demonstrations for soybean, 50 for groundnut, 40 for sweet bean and 20 for cowpea would be conducted. The numbers of demonstrations per crop, extension agents that would be involved, and farmers are given in Table 24. The dissemination and extension activities include community mobilization and group sensitization, agronomic and post harvest trainings and conducting agronomic technology demonstrations, large and mini farmer field days, nutritional and media campaigns and market linkages.

**Table 24: Number of demonstrations per crop, extension agents needed, communities and farmers in Zimbabwe, 2010/2011 planting season**

	Demonstration						Participating Farmers	
	Soybean	Groundnut	Bean	Cowpea	Total	*EAs	Farmers	**Total
Wedza,	10	5	2	2	19	3	285	304
Murewa	5	8	6	2	21	3	315	336
Mudzi	3	10	5	2	20	3	300	320
Goromonzi	10	4	7	2	23	3	345	368
Chegutu	5	6	5	2	18	3	270	288
Makonde	6	5	5	4	20	3	300	320
Guruve	5	4	6	4	19	3	285	304
Makoni,	6	8	4	2	20	3	300	320
<b>Total</b>	<b>50</b>	<b>50</b>	<b>40</b>	<b>20</b>	<b>160</b>	<b>24</b>	<b>2400</b>	<b>2560</b>

\*EAs: Number of extension agents

\*\*Total: Total number of farmer, 1 lead farmer and 15 group members

### Capacity building

#### Training of Trainers/Local Trainings

Two senior extension agents from Zimbabwe participated in the Training of trainers organized by the project from 24<sup>th</sup> to 28<sup>th</sup> May 2010, in Kisumu Kenya. The two trainees in collaboration with the hub office will organize the training of extension agents and lead farmers from the 8 participating districts. Dates of the various training will be finalized in due course.

Expected topic includes:

1. Objectives and expectations of N2Africa
2. Legumes, nitrogen and rhizobia
3. Legume based cropping systems
4. Inoculants and inoculation (handling and use)
5. Practical demonstration of inoculation (handling and use)
6. Demo plot layouts and data collection (practical)
7. Expectation from farmer groups and lead/master farmers
8. Mid season and end of season evaluations
9. Post harvest handling



**Table 25: Major N2Africa partners in Zimbabwe and their area of coverage in the project**

Province	District	*Partners
Mashoni East	Wedza	SOFESCA/ZNSCA
	Murewa	CRS
	Mudzi	CTDT
	Goromonzi	CADS
Mashoni West	Chegutu	CTDT
	Makonde	ZNSCA
Mashoni Central	Guruve	CLUSA
Manicaland	Makoni	SOFESCA

Other activities	
Nutrition	CADS/ZNSCA
Marketing	ZNSCA/CADS
Soil testing	UZ Soil Science
Mobilization	ZFU
Training	SPRL
Inoculants	SPRL
Inputs packaging and distribution	SPRL
Soybean seed	Seed-co and CBI
Cowpea seed	CBI and Agriseeds
Bean seed	Agriseeds
Groundnut seed	Agriseeds

\*Partners: Full meaning in table 26

### Building Partnership

The major partners who will be involved in the implementation of the dissemination and extension components within the districts are given in Table 25. SPRL will lead the training activities in all the districts as well as provision of inoculants. Seed-co and Agriseed will provide certified seed; CBI will provide breeder/foundation seed where ever needed. Partner in-charge of the various districts will assist in identifying participating communities and farmer groups as well as general mobilization of communities and farmers.

**Table 26 The Full meaning of Acronyms used in Zimbabwe**

Acronyms	Full meaning
ZNSCA	Zimbabwe National Soya Bean Commodity Association
CRS	Catholic Relief Services
CTDT	Community Technology Development Trust
CADS	Cluster Agricultural Development Services
CLUSA	CLUSA International
SOFESCA	Soil Fertility Consortium for Southern Africa
UZ	University of Zimbabwe
CBI	Crop Breeding Institute
SPRL	Soil Productivity Research Laboratory



ZFU	Zimbabwe Farmers' Union
Agriseeds	Agriseed Ltd
Seed-co	Seed Co Ltd

### Step 2: Inputs secured.

**Seed.** Soybean seed can be purchased from Seed Co who has excellent high yielding varieties that respond strongly to inoculation. The new promiscuous TGX varieties released in 2009 will also be imported for testing in Zimbabwe. A seed company Agriseeds is currently contracting smallholder farmers in Wedza to produce cowpea (varieties IT18 and CBC2) and groundnut seed. This linkage has been made through SOFECSA and hopefully can be expanded in the future. Varieties of common bean will be accessed through Agriseed.

**Inoculant.** The Soil Productivity Research Laboratory (SPRL), Grasslands, Marondera have a current capacity to produce 100,000 packets of inoculum each year, which can be extended to 300,000 packets once facilities are repaired and upgraded. All inoculants are sold commercially through the national extension services (AGRITEX) or through agro-dealers.

**Fertilizers:** Fertilizer will be obtain from the commercial marketer mainly ZimPhos

The inputs needed for demonstrations in Zimbabwe in the 2010/2011 season are given in Table 27. A total of 3468 kg of seed comprising of 1520 kg of Soybean seed, 350 kg of cowpea seed, 950 kg of groundnut seeds and 648 kg of bean seed will be required for the demonstration and dissemination activities. Other inputs include 14.72 tons of fertilizer, thirty-three liters of insecticides and fungicides, and 760 g of inoculants.

**Table 27: Inputs for Dissemination Activities in Zimbabwe 2010/2011**

Inputs	Soybean	Cowpea	Groundnut	Bean	Total
Number of demos	50	20	50	40	160
Number of farmers	800	320	800	640	2560
Total land area (ha)	19	14	19	21.6	74
Seed (kg)	1520	350	950	1512	3468
Fertilizer (kg)	3800	2800	3800	4320	14720
Fertilizer (bag)	76	56	76	86.4	294
Insecticide (l)	19	14	0	0	33
Inoculum (g)	760	0	0	0	760

### Step 3: Field protocols developed.

#### Demonstration plots

The technologies and varieties that would be included in the demo plots are given in Table 28. Each demo plot will be 20 m x 30 m (600 m<sup>2</sup>). A demo plot will be made of maximum of 3 treatments each 20 m x 10 m (200 m<sup>2</sup>) or occasional 2 treatments, each 20 m x 10 m (300 m<sup>2</sup>) in size. Plot layouts including field log books will accompany the inputs. Partners are encouraged to adopt proven extension methods in addition to the extension method design by N2Africa; however this should be documented to allow for comparison and up scaling.

**Table 28: Technologies and crop varieties in demonstrations**

Crop	Technologies	Varieties
Soybean	Inoculants	SC saga, SC Squire, SC Squire 1
	Varieties	
	Rotation	
	Fertilizer (Lime, P, gypsum, manure)	
	Planting pattern	
Groundnut	Varieties	Ilanda, Nyanda, JL24,



	Fertilizer (Lime, P, gypsum, manure)	Chitala, CG7, Nsinjoro, Chalimbana
	Intercrop	
Cowpea	Varieties	
	Fertilizer (Lime, P, gypsum, manure)	CBC1 and CBC2
	Intercrop	
Sweet bean	Varieties	Purple card, CB1
	Fertilizer (Lime, P, gypsum, manure)	

#### **Step 4: Technologies deployed.**

##### **Supervision and Data Collection**

The day to day supervision of crop production activities and data collection will be done by the trained extension agents from the partner organizations in charge of the respective communities. The lead farmers are expected to assist the extension agents. The Lead farmers report to the Extension agents who report to his/her main supervisors. The partnering organizations in charge of the various districts can seek assistance of the project staff and other resources available in the country as well as the Southern Africa hub office to facilitate activities as the need arises.

#### **Step 5. Support Actions in Year 1.**

##### **Activity 4.1.1. MoUs formalized.**

The dissemination plan based on the country planning meetings has been circulated among partners for their inputs. This will be reviewed and form the basis of MoUs with partners

##### **Activity 4.4.3: Extension events conducted.**

###### **Field days/mid season and end season evaluations**

One major field day will be conducted in each of the 8 districts and mid-season and end of season evaluations will also be conducted on at least 50% of the demo plots. An internal monitoring and evaluation is enshrined in the extension method through the mid-season and end of season evaluations that will be conducted. These activities will be used to get valuable feed backs from farmers about the performances of the technologies on display and planning for the subsequent season.

##### **Activity 4.4.4. Mass media events organized.**

###### **Media campaigns (radio, TV, bulletin, Information centre etc)**

We will organize 4 mass media campaigns during the planting season specifically when the crops are podding, at harvest and during the processing and nutrition training period.

##### **Activity 4.5.3. Special events on women's grain legume enterprise conducted.**

###### **Other Extension and Dissemination Activities**

###### **Training and demonstration on Nutrition and food processing**

These trainings will be conducted at the end of the growing season when farmers complete harvesting. The trainings are intended to demonstrate to the small holder farmers especially the women farmers, the nutritional importance and house hold uses of these legumes. Several recipes of these legumes will be demonstrated and the women will be trained on the preparation of these recipes. Efforts are under way to publish manuals of recipes of cowpea, soybean, groundnut and common bean which will be used during the trainings.

###### **Training Post harvest (storage, drying etc)**

This will be conducted during the TOT scheduled for September.





## 10. Mechanisms for monitoring, evaluating and revising country-specific strategies

Monitoring and evaluation procedures are designed to encourage learning as well as accountability. A comprehensive plan for the monitoring and evaluation of the project and its activities is being developed and will outline the country specific strategies for monitoring and evaluation of the whole project in general as well as specific monitoring and evaluation activities for each of the objectives. While acknowledging the country-specificity, the overall M&E plan strives for data collection and learning through comparable mechanisms in the eight countries.

In this plan, we focus on some preliminary propositions for monitoring and evaluation of the dissemination activities as well as monitoring the country specific dissemination strategies so that these can be adjusted as appropriate – most likely per growing season. With the N2Africa dissemination strategy being finalized and the partner organisations selected, we can now finalize the monitoring tools soliciting and incorporating final feedback from partners.

Currently preparations are underway to implement an extensive baseline survey in order to establish the current state of affairs in the smallholder agriculture livelihoods in all the eight countries. Establishment of BNF will be done in close collaboration with activities for objective 2 – agronomy during the course of the different growing seasons. Later in the year – but as soon as feasible – smaller baseline studies will be done on income and nutritional status. These different baseline studies will provide us with information against which we will be able to monitor the progress of the project as well as assess the impact of the project at the end of the project in 2013.

In order to specifically monitor the dissemination activities, it is proposed to monitor the following indicators:

- Number of farmers receiving inputs and information (i.e. number of packages distributed)
- Number of demonstration plots established
- Number of visits to demonstration plots and their content (who, male/female, issues discussed, follow-up)
- Number of training events and the content
- Number of different dissemination tools employed by the project and its partners (include evaluation of the effectiveness)
- Number of media events

Once the number of farmers receiving specific services from N2Africa partner organisations has been established and the baseline study has provided us with a baseline against which change can be measured, we will assess whether there has been improvement in income (including increase of sales, net profit) and nutritional status specifically and in livelihoods in general (including empowerment of women) resulting from the interventions of the project. In order to be able assess this; we will need to measure the following indicators:

- Yield of grain legumes and maize and surfaces planted -> productivity
- Market information on prices for legumes and maize, accessibility of markets, costs of inputs
- ...

In addition, it will be highly relevant to assess the different dissemination strategies employed by different partners in different countries. This will provide us with important lessons on what works, where, how and why. For this we will make an inventory of the strategies deployed as well as an assessment of 'drop-out' (for this we will need to clearly define reach (which is to replace 'empowered households'), drop-out and some other terminology). Partly the assessment of effectiveness of dissemination strategies can be based on counting number of dissemination activities, numbers of farmers, etc. However, additional qualitative study will be needed to comprehensively assess the diverse dissemination pathways.



The M&E scientist will finalize the methodologies for collecting the information needed from the Objective 4 activities as well as propose a time-line and budget for the monitoring and evaluation. These methodologies will also specify the data source, timing and frequency of data collection.

With technical backstopping from the M&E scientist and the leader of Objective 4, the partner organisations will be responsible for the collection of the data for the monitoring of the dissemination activities. The dissemination partners will also be expected to collaborate in data collection for the specific monitoring of more general project indicators such as varieties used by farmers, use of inoculants, participatory farmers' evaluation of trials, etc.

The M&E scientist will collaborate with the national partners to analyze the data and produce the appropriate reports. In order to allow for essential learning from the monitoring, the results will be shared with the partner organisations and with farmers for feedback and improving our practices. In this way M&E promotes joint reflection, learning and continued improvement by all stakeholders.

If there is a shared interest, Objective 4 activities could encompass comparative qualitative research into the dynamics of the adoption processes of agricultural technologies, providing a more comprehensive understanding of the socio-cultural processes of adoption. The decision by farmers to cultivate N<sub>2</sub>-fixing legumes could have very little to do with the nitrogen fixation capacity of the crop(s), but it might be motivated by different factors such as better storage of grain legumes compared to maize, prohibitive prices of inputs necessary for the cultivation of alternative crops, etc. These processes are crucial to understand if you want to make sense of your dissemination and adoption. Here also issues like gender, perception of legumes, adaptations of technologies by farmers, could be addressed.

The information from the monitoring and evaluation, combined with increased knowledge of the dynamics of adoption and dissemination pathways will enhance the scaling up of the project and increase the impact of the project on smallholder farmers' lives in Africa.



## Appendices

### Appendix 1- List of participants – N2Africa Malawi Project Launch and Programme Planning Meeting, Crossroads Hotel, Lilongwe Malawi: 10 – 11 June 2010

NO	NAME	POSITION	ORGANISATION AND ADDRESS
1	Abaidoo Robert	Soil Microbiologist	IITA, PMB 5320, Oyo Road, Ibadan, Nigeria
2	Ajeigbe Hakeem	Extension/Dissemination Specialist	IITA-Malawi P.O. Box 30258 Lilongwe 3, Malawi
3	Alene Arega	Agricultural Economist	P.O. Box 30258 Lilongwe 3, Malawi
4	Baijukya Frederick Philbert	Agronomist	CIAT-TSBF Maseno, Kenya
5	Banda Kingsley	MCCCI/FYE-MW	P.O. Box 311, Blantyre
6	Banda Mackson Phillimon	Deputy Director	Department of Agricultural Research Services P.O. Box 30779, Lilongwe 3, Malawi
7	Chamango Albert M.Z.	Groundnut Breeder	Chitedze Research Station, P.O. Box 158, Lilongwe, Malawi
8	Chikoye David	Director	IITA Lusaka, Zambia
9	Chikungwa Andrew	Agricultural Economist	Department of Agricultural Research Services P.O. Box 30779, Lilongwe 3, Malawi
10	de Wolf Judith	M & E Scientist	N2Africa TSBF-CIAT Box MP 128 Mount Pleasant Harare, Zimbabwe
11	Franke Linus	Scientist	Wageningen University Duistereweg 2, 3gu Ak Rherer, The Netherlands
12	Gondwe Joseph	Communication Officer	HHF, P.O. Box 1020, Lilongwe
13	Kabuli Amon Mkondambiri	Agricultural Economist/ Research Fellow	SOFECSA, Bunda College, Box 219, Lilongwe, Malawi
14	Kalunga Docile	Southern Africa Food and Nutrition Security Coordinator	World Vision, Box 692, Lilongwe , Malawi
15	Kamoto Judith	Senior Lecturer	Bunda College P.O. Box 219 Lilongwe, Malawi



<b>NO</b>	<b>NAME</b>	<b>POSITION</b>	<b>ORGANISATION AND ADDRESS</b>
16	Kananji Geoffrey	Soybean Breeder	Chitedze Research Station, P.O. Box 158 Lilongwe, Malawi
17	Kanyenda Esnart Kondowe	Technician in Agronomy	Bunda College of Agriculture, P.O. Box 219, Lilongwe, Malawi
18	Kapondamgaga Prince	Executive Director	Farmers Union of Malawi, Box 30457, Lilongwe 3, Malawi
19	Karuma Joshua	Country Representative	AFRICARE Malawi Box 2346, Lilongwe Malawi
20	Kazombo Samson	Agricultural Economist	Department of Agricultural Research Services P.O. Box 30779, Lilongwe 3, Malawi
21	Koala Saidou	Afnet Coordinator, N2Africa Objective 5 Leader	CIAT-TSBF, P.O. Box 823 UN Avenue Gigiri, Nairobi, Kenya
22	Liwimbi Lloyd Chipiliro Siyani	Principal Agricultural Research Officer	Chitedze Research Station, P.O. Box 158, Lilongwe, Malawi
23	Luhanga, Joefrey	Controller of Agriculture, Extension and Technical Services	Ministry of Agriculture and Food Security
24	Lwanda Margaret Beatrice	Deputy Director for Food and Nutrition	Dept. of Agric. Ext. Service, Box 30145, Lilongwe 3, Malawi
25	Malindi Grace Margaret	Director	Department of Agric. Extension Services, Box 30145, Lilongwe 3, Malawi
26	Matumba Annie	Research Scientist	Chitedze Research Station, P.O. Box 158 Lilongwe, Malawi
27	Munthali Lawrence Bowojeke	Project Manager	Livelihoods & Food Security, CRS Malawi, P/Bag B-319, Lilongwe, Malawi
28	Mzungu Maggie	Senior Programs Manager	AFRICARE Malawi Box 2346 Lilongwe, Malawi
29	Nelson Larry J.	Technical Coordinator,	WALA Program, CRS & Consortium , P/Bag 192, Blantyre, Malawi
30	Ngwira Austin	Director of Agriculture	Clinton Hunter Development Initiative P/Bag 68, Lilongwe Malawi
31	Nkhukuzalira Lyson Daniel	Field Production Manager/Inspector	Seed-co Malawi P/Bag 421, Kanengo Lilongwe 4, Malawi



<b>NO</b>	<b>NAME</b>	<b>POSITION</b>	<b>ORGANISATION AND ADDRESS</b>
32	Nkhwali John	Group Village Headman	c/o Chitala Research Station, Salima, Malawi
33	Nkhwali Nepar Beston	Field Technician	Chana Village, T.A. Khombedza, Salima Malawi
34	Nyama Nessimu Jessimon	Marketing Chairman	Association of Smallholder Seed Multiplication Action Group (ASSMAG), Box 30679, Lilongwe 3, Malawi
35	Nyirenda Esnat	Research Scientist	Chitedze Research Station, P.O. Box 158 Lilongwe, Malawi
36	Rufino Mariana Cristina	Scientist	Wageningen University, P.O. Box 430 6700 AK Wageningen The Netherlands
37	Simpuki Brave	Commercial Farm Manager	Clinton Hunter Development Initiative P/Bag 68, Lilongwe Malawi
38	Tefera Hailu	Soybean Breeder and IITA Malawi Country Representative	P.O. Box 30258 Lilongwe 3, Malawi
39	Tewolde Michael	Head of Programming	Catholic Relief Service (CRS) P/Bag B-319, Lilongwe, Malawi
40	Van Vugt Daniel	Legume Agronomist	IITA-Malawi, Box 30258 Lilongwe 3, Malawi
41	Zulu Mathews	Farm Services Manager	NASFAM, Box 30716 Lilongwe 3, Malawi



**Appendix 2- N2Africa Planning meeting, Zimbabwe 14-15 June 2010, St. Lucia Park Training Centre**

<b>Institution</b>	<b>Participants</b>
DR&SS, Chemistry and Soils Research Institute	D.K.C. Dhliwayo  Danisile Hikwa  Farai Mapanda (Crop nutrition)
Soil Productivity Research Laboratory (SPRL)	Mazvita Murwira Marondera  Akinson Tumbure  Collis Mukungurutse  Joram Tapfuma (Legume Inoculant Factory)
University of Zimbabwe	<u>Dept. of Soil Sciences &amp; Agricultural Engineering</u> L.P. Mafongoya  Elijah Nyakudya  <u>Dept. of Animal Sciences</u> T.E. Halimani  <u>Dept of Agricultural Economics &amp; Extension</u>  Benjamine Hanyani-Mlambo  <u>Dept. of Crop Sciences</u> Peter Jowah
Community Technology Development Trust (CommuTech)	Fred Zinanga  Joseph Mushonga  Andrew Mushita
Cluster Agricultural Development Services (CADS)	Charles Makona  Cathrine Chahweta  Douglas Mrewa
Agricultural Research Council	Obert Randi  I. Mharapara
ZAPAD-Clusa	Ben Nyakanda  Thomas Gardiner





Catholic Relief Services (CRS)	Solomon Tesfamariam Wilfred Munguri
SOFECSA, UZ	Paul Mapfumo – CIMMYT Florence Mtambanengwe Regis Chikowo
Seed Co Ltd	Ephrame Havazvidi Jacob Tichagwa
Farmers' World	Patrick Musira
Zimbabwe Farmers' Union (ZFU)	Elimon Maponde
Zimbabwe National SoyBean Commodity Ass. (ZNSCA)	Elizabeth Musimwa
Agriseeds	Rob Kelly
Agritex Wedza	Tarwireyi Kahiya
N2Africa	Kenton Dashiell (CIAT-TSBF) Saidou Koala (CIAT-TSBF) Robert Abaidoo (IITA) Freddy Baijukya (CIAT-TSBF) Hakeem Ajeigbe (IITA) Mariana Rufino (Wageningen UR) Linus Franke (Wageningen UR) Judith de Wolf (CIAT-TSBF)



### Appendix 3. LIST OF PARTICIPANTS

N2 FIX AFRICA MOZAMBIQUE MEETING, NAMPULA 17 – 18 JULY 2010

No.	Name	Address	Area of expertise
1	Narciso Rodrigues	Cister Mozambique	Common Beans
2	Rachad Ussene	IITA-Mozambique	Legume Project
3	Amir Ivan	Technoserve Av. Eduardo Mondlane 3 Piso, 314	Commercial Contracts M & E Official Soy Value Chain Project
4	Venancio Salegua	IIAM-Nampula	Socio-Economico
5	Ananias P. Khonje	Technoserve	Technico Campo, Chimoio, Soja Beans
6	Moises Raposo	Ikuro-Nampula	Agronomy
7	Ken Dashiell	TSBF-CIAT Nairobi, Kenya	N2Africa Project Leader
8	Carlos Pedro	IITA-Mozambique, Gurue	Legume
9	Martin Martin	CLUSA	
10	Lucilio Gerson Daniel	CLUSA_Gurue	Communication and Agro-Business
11	Freddy Baijukya	TSBF-CIAT N2Africa Maseno, Kenya	Farming Systems Agronomist
12	Manuel Delgado	SAN-JFS Company Mozambique	Algadao/SOJA
13	Julio Costa	Agrifuturo, Nampula, Predio Girassol 1No. ANDAR	AGRO-GESTAO
14	Luis Pereira	Techno Serve Nampula	Director de Programas Agrocolas Soy Value Cahin Program
15	Sheila Amaro	IITA-Mozambique	Agronomy
16.	Dias Domingos	IIAM-CZC	
17	Linus Franke	Plant Sciences Department, Wageningen UR, Netherlands	Farming Systems
18	Judith de Wolf	TSBF-CIAT Harare, Zimbabwe	M & E Scientist
19	Penina Muoki	IITA-Nampula. Mozambique	Food Scientist
20	Tiana Campos	IITA-Nampula	Legumes Breeding
21	Abass Adebayo	IITA-Tanzania Box 3444 Dar es Salaam	Soybean Processing and Value Chain Development
22	Nanam Dziedzoave	CSIR-FOOF Research Accra	Food Technology
23	Stephen Boahen	IITA-Nampula Av. Eduardo Mondlane 352, Edificio Girassol 2Andar, porta 210 Mozambique	Legume Specialist
24	Manuel Amane	IIAM Av. FPLM 2698 Maputo	Agronomy
25	Amade Muitia	IIAM Nampula	Breeding
26	Paiva	UEM/FAEF	



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	Munguambe	Maputo	
27	Hakeem A. Ajeigbe	N2Africa c/o IITA-Malawi Chitedze Research Station Box 30258, Lilongwe 3, Malawi	Extension/Dissemination





## 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



## Partners involved in the N2Africa project



Diobass



Université Catholique de Bukavu



University of Zimbabwe

- Programme d'appui au développement durable (PAD) DRC
- Service d'Accompagnement et de Renforcement des capacités d'Auto promotion de la Femme en sigle – SARCAF (DRC)