



**Satellite sites and activities in the  
impact zones of the N2Africa project**

Milestone 4.1.3

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**N2Africa**

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



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## 1. Introduction

Objective 4 of N2Africa, on delivery of legume and inoculant technologies to farmers throughout sub-Saharan Africa, requires the project to have identified at least 10 additional satellite sites by month 12 of year 3 per impact zone in order to create strategic alliances for facilitating dissemination of legume and inoculant technologies (Milestone 4.1.3). The three impact zones refer to the East and Central Africa highland region (DRC, Rwanda and Western Kenya), the Western Africa region (Ghana and Nigeria) and the Southern Africa region, with agro-climatic conditions favourable for the cultivation of legume crops targeted by the project.

The project dissemination strategy explained in the project proposal foresees the buy-in from additional partners in the fourth year of the project leading to a 2.5-fold expansion or replication of project activities in collaborating satellite areas adjacent to the actions sites. Hence the milestone as defined, without specifying a target for the number of households reached in this manner. Satellite sites are sites where partners and other organizations implement activities related to the dissemination of legume and BNF technologies. They do not necessarily need to be in the periphery of our action sites where, nor do the activities need to be exclusively or only related to dissemination of legume and BNF technology. These organizations, which we refer to as satellite partners, have adopted N2Africa technologies and build on its momentum, but at no extra cost to the program. An important distinction from outreach partners is that the latter receive funds and inputs directly from the program. The distinction is a bit obscured by that, in some cases, we do provide the satellite partners with inputs and provide training as well.

For the reporting we broaden the scope of satellite sites and the associated outreach activities to include activities that move beyond the dissemination but that are still central to achieving the project objectives and contribute to its outcomes. These activities may refer to input manufacture and supply, post harvest handling, linking farmers to markets, value addition and processing to give some examples. These activities are implemented within the project action sites as well as in the satellite sites. Again, partners undertake these activities at their own expense, generally as part of another project with separate funding. Planning for these activities might not be part of the planning process of the N2Africa project, but activities are often closely linked. We refer to these projects as associated projects. To some extent we can consider the funds used for implementing these satellite activities as a source of co-funding to the N2Africa project.

Though the satellite activities the project is being scaled out and up. In several cases these satellite activities extend beyond the end date of the N2Africa project Phase I, and provide opportunities for engagement of the project in its second phase. The satellite activities where they occur are testimony to the success of the project or at least of the technologies promoted by the project.

Rather than reporting per impact zone, we report per country as the satellite sites and activities are considered a spin-off from the country programs and D&D activities. We sub-divided the country chapters according to activities related to outreach activities, to creating market linkages and outgrower schemes where relevant, the input manufacture and input distribution, to seed production and processing and value addition related activities.



## 2. Kenya

### 2.1 Dissemination of legume and BNF technologies in satellite sites (outreach activities)

#### Satellite activities by existing outreach partners

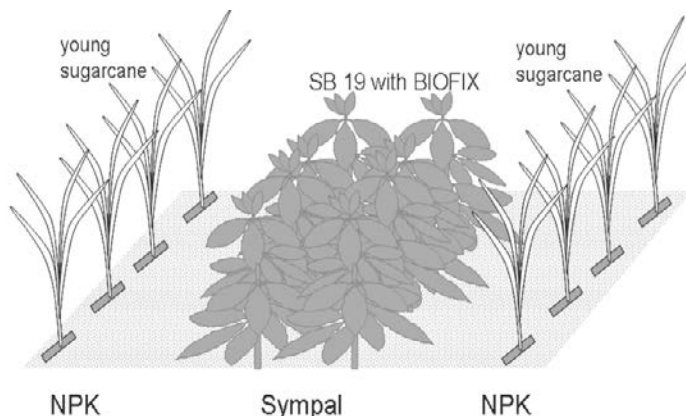
The distinction between outreach partners and satellite partners is sometimes lost. For example, The Reckoning International ([www.thereckoning.org](http://www.thereckoning.org)), a faith-based outreach partner in west Kenya joined the program for the last season of the project. They only received farm inputs on behalf of its members but no operating funds. The farmers reached by Reckoning international are included in the statistics of the project.

Two of our outreach co-operators, Kenya Soyabean Farmers Association (KESOFA) and Mwangaza Farmers Group Organization (MFAGRO) have extended their numbers of participating farmers well beyond the targets set and supported by the program, opening new opportunities through revolving funds and marketing collection points for all their members. The goal of MFAGRO is to bring new technologies to its members and farmers of Vihiga County, Western Kenya. Much of MFAGRO's effectiveness and growth is attributed to the collaboration with N2Africa. MFAGRO has, in addition to the farmers reached through facilitation of the N2Africa project (1320 new farmers during the last season, exploring soyabean production on 200 m<sup>2</sup> plots, and 75 progressive farmers producing at least 0.5 acre), reached an additional 300 members that came to know about soyabean as a result of local N2Africa outreach efforts. They are also promoting climbing beans (cv. Kenya Tamu) among 120 members.

#### Mumias Sugar Intercropping

N2Africa has endeavoured to create private sector linkages. Mumias Sugar Ltd., Promasidor Ltd. and the N2Africa Program are working together to intercrop 1000 acres (400 ha) of sugarcane and soyabeans (SB19). MUDIFISOF, one of the outreach partners of the project provided the seed. The area is one of nine "blocks" of the core plantation in west Kenya where two rows of soyabean SB19 will be planted between rows of newly planted sugarcane twice before the sugarcane closes its canopy. The soyabean will be managed according to the N2Africa best practices guidelines that include use of BIOFIX inoculant and Sympal fertilizer. Promasidor Ltd. is extending a market guarantee and has arranged purchase of 10 tons of SB19 from N2Africa partners to be used as the initial seed.

While most of the harvest will be sold to Promasidor, Mumias Sugar has also requested assistance of



**Figure 1: Arrangement of soyabean-sugarcane intercrop proposed by Mumias Sugar, Kenya**

N2Africa in the use of these soyabeans to improve household nutrition of its workers. This development signifies a breakthrough in our achieving large-scale buy-ins by satellite partners relying upon N2Africa technologies but at no cost to the program. This development complements the local activities of MUDIFISOF, a west Kenyan outreach partner that promotes BNF technologies among many Mumias Sugar out-growers. This is the third soyabean intercrop system to emerge from west Kenya, the others being soyabean-maize and soyabean



dwarf sorghum.

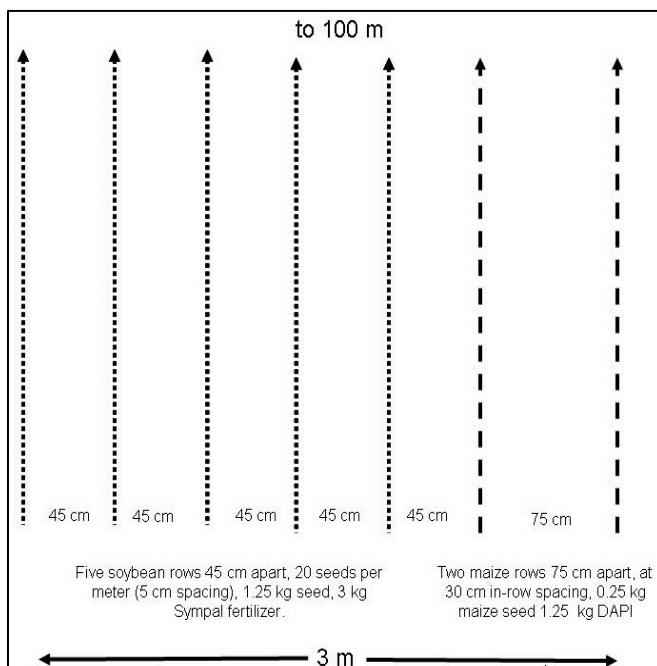
**The Agricultural Development Corporation (ADC) Farm**

N2Africa has recently partnered with Kenya's Agricultural Development Corporation (ADC). ADCs Mission is "to promote sustainable agricultural development and reconstruction in Kenya by initiating, assisting and expanding agricultural undertakings and enterprises through production and supply of quality seed, livestock, technological transfers and training in a sustainable and affordable manner" ([www.adc.co.ke](http://www.adc.co.ke)). ADC serves as an agribusiness incubator promoting proven agricultural enterprises to spin-off new commercial operations. ADC contacted N2Africa on the feasibility of growing soyabean, agreed to purchase Sympal fertilizer and BIOFIX inoculant, and to participate in our 2-for-1 seed increase arrangement, receiving 200 kg of SB19.

Two hundred and fifty (250) acres will be planted on land leased from the 3000 acre ADC Complex at Kiswani, near Malindi along the Sabaki River (see photos). The ADC Kiswani Complex is located in the Coastal Belts with the altitude of 15 m above sea level and an average rainfall of 1,105mm. Forty-five (45) acres are under irrigation growing mixed vegetables; they are however looking for an alternative to the non-irrigated maize growing on an upper flood plain that has failed twice.



**Figure 2: The ADC team receiving inputs from N2Africa through John Mimingi (left) and overview of the ADC farm for mixed vegetables (irrigated) and maize and soyabean (right)**



A series of discussions and field visits were conducted to adapt the N2Africa extension information intended for smallholders to a semi-mechanized commercial system. While preparing the seedbed (a sandy clay) by disc and harrow and establishing planting furrows at the 45 cm recommended spacing presents no problem, the question on the pre-emergent herbicide to be used for soyabean could not be answered directly (Dual Gold distributed by Syngenta was later recommended by our SeedCo partner). Also the four-row planter may not be able to deliver seed at 5 cm in-row spacing. Nonetheless plans are now at an advanced stage for the upcoming long rains. Strip cropping will be practiced according to the scheme to the left.

Inoculated soyabean will be planted in five, 45 cm rows next to two 75 cm rows of maize





(see diagram). A four ha rain-fed field was identified for planting that has potential for supplemental irrigation if necessary. Other soyabean varieties will be assessed on smaller plots. Even early plans for outgrowing by nearby smallholders are being formulated.

### One Acre Fund

One Acre Fund is a nonprofit organization that started in January 2006 with the goal of solving the chronic hunger problem in Africa. The core of its program is a proven investment package for farmers and their families, which "double farm income by providing seeds and fertilizer, weekly farm education, and market facilitation". It currently serves over 137,000 families in 23 districts in Kenya, Rwanda, and Burundi and maintains a large farm input supply warehouse in west Kenya.



**Figure 3: Farm inputs stocked at the large warehouse operated by the One Acre Fund at Bungoma**

Collaboration between N2Africa and One Acre Fund in Kenya started when One Acre Fund proposed the empowerment of 35,000 farmers to test soyabean on 1750 acres as an alternative crop to maize after the Maize Lethal Necrosis Virus epidemic; this was later reduced to 200 farmers testing soyabean on 1000 m<sup>2</sup> each. This effort has adopted the N2Africa soyabean best practices, and purchased 1600 kg of SB19 seed from our cooperator MUDIFESOF in Mumias. It has also ordered BIOFIX and Sympal at recommended rates from MEA Ltd.

## 2.2 Partnership in market linkages and out-growers networks

### Promasidor Out-grower Network

Promasidor is a multi-local food manufacturer that markets products in more than 25 countries across Africa. Promasidor commenced operations in Kenya in 1988 marketing milk and seasoning powders and later added the soya product Sossi, a textured vegetable protein that contains 80% textured soya and 20% seasoning ([www.promasidor.com/Kenya](http://www.promasidor.com/Kenya), see Figure 4). The soyabeans used in this process must be the culinary, non-GMO type, with a protein to oil ratio greater than 2.1. It processes about 4000 tons of soyabeans per year; most of it imported, but seeks to expand its domestic supply.

In collaboration with N2Africa, Promasidor established 16 soyabean grain collection points and launched an out-grower scheme in west Kenya. These out-growers produce SB19 and follow the project's "Best Soyabean Practice Guideline", including recommended use of BIOFIX inoculant and Sympal fertilizer. Promasidor has distributed 8000 packets of inoculant and 80 tons of fertilizer to 400 farmers under a credit system in which the cost of inputs are deducted from deposited payment. The Promasidor out-grower network, the members many of which started as BNF technology testing farmers in 2010 and 2011, produced about 160 tons of soyabean in 2012, and continues into 2013.



Figure 4: Sossi, a textured soyabean product that is widely available on the Kenyan market

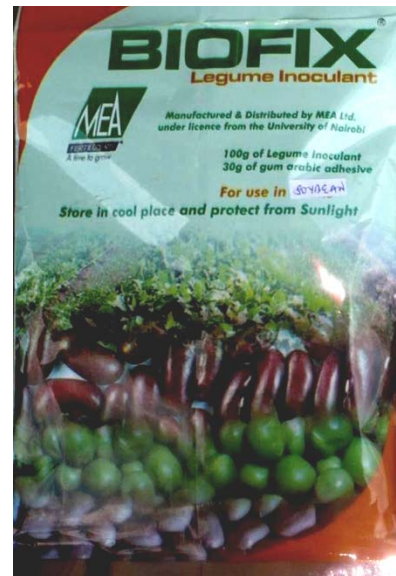


Figure 5: BIOFIX legume inoculant improved through partnership with N2Africa

### 2.3 Partnership for Input manufacture and distribution

#### MEA Ltd. Farm Input Manufacturer

N2Africa partners with MEA Ltd., a larger farm input manufacturer that blends Sympal (0-23-16 + Ca, S, Mg & Zn), a fertilizer designed and tested by N2Africa. Since Mid-2011 454 tons have been distributed within Kenya and exported to various countries in Eastern and Southern Africa. Sympal is available in 2, 10 and 50kg bags for about \$0.79 per kg.



Figure 6: The MEA blending facility produces SYMPAL. SYMPAL (0-23-16+), composed of 7 parts TSP, 7 parts SSP, 5 parts KCl and one part MgSO<sub>4</sub>. Sympal is available in 2, 10 and 50 kg bags for about \$0.79 per kg and is stocked by members of the Kenya Agro-dealers



MEA also produces BIOFIX legume inoculant through a licensing agreement with the University of Nairobi since 2010. N2Africa works closely with MEA to develop an inoculant quality assurance program, improve carrier sterilization, examine new inoculant carrier materials, and increase farmer and agro-dealer awareness of inoculants. BIOFIX is available as 10, 20, 50 and 100 g packets for about \$14 per kg. Production has increased six-fold since production started in 2010. MEA has agreed to test the elite rhizobia identified by the project as possible replacements for industry standards in 2014. N2Africa helped MEA recently to secure a grant to investigate and test improved production methods, moving from the currently up-scaled laboratory method to a more industrial process that will improve their production capacity considerably. We hope to see an strong increase in the use of inoculants in Kenya and other countries in the region through this partnership.

## 2.4 Community based seed multiplication of new varieties

### Mwangaza Farmers Group Organization (MFAGRO)

N2Africa has enhanced MFAGRO seed multiplication activities in western Kenya. MFAGRO now produces over 2.5 tons of improved legume seed per season for sale to its members. The farmer's group organization has established both a farm inputs supply shop and a grain legume market collection point. Members of the organization also engage in value addition to soyabean as a cottage industry, and their soymilk, soya beverage and mixed flour cakes are widely appreciated. N2Africa recognized these achievements by inviting a group officer on its recent farmers' tour, visiting MEA Ltd, KARI-Muguga, Promisidor's soyabean processing factory and CIAT Headquarters in Nairobi. This tour



**Figure 7: MFAGRO's officials in one of their soyabean seed multiplication fields during the 2012-2013 Short Rains (Photo Dick Morgan Ongai)**

helped the group officer to better understand the operations of N2Africa, suppliers and buyers, and to better grade soyabean for specific markets. Through MFAGRO, the project has been able to provide satellite outreach partners with the required seed (see activities reported under section 2.1).

The 400 farmers of Kleen Homes and Gardens (KHG) in Butare also organized their seed multiplication, but for their own use. Each farmer bulked 10 kg of seed, and planted  $\frac{1}{2}$  acre (2000 m<sup>2</sup>) of soyabean expecting to produce 100 tons of soya worth \$38,000. N2Africa assisted them by providing inoculants and extension literature.

## 2.5 Partnership for processing and value addition

### UNIDO Soyabean Processing Factories

The United Nations Industrial Development Organization (UNIDO) and the Government of Japan funded three soyabean-processing factories in west Kenya using state-of-the-art Japanese equipment. Arrangements were forged with the Kenyan Ministry of Industrial Development to accommodate these factories and six trainees were sent to Japan to gain experience with the machinery and processes. At first, N2Africa was asked to guarantee supply of about 220 tons of soyabeans per year.



Our interaction with the project increased when one of the N2Africa Node Leaders in west Kenya was recruited by UNIDO to serve as national coordinator to oversee the installation of the equipment and to launch factory operations. Factories are able to process about 45 kg of soyabean per hour. The governor has opened factories in Migori, Kisumu and Malakisi officially on 7, 8 and 9<sup>th</sup> of May 2013 respectively. Each will specialize in a different range of soya products. Soymilk will be used in school nutrition programs. Fortified blends will be used in famine relief. Other mechanisms are being explored so as not to interfere with local entrepreneurial opportunities. From its modest attempts at the cottage industry scale designed to improve household nutrition, soyabean processing within the program has grown to represent a considerable market for west Kenya's farmers and a great opportunity to better respond to humanitarian crises in Africa.



**Figure 8: This state-of-the-art soya milk processor was provided through UNIDO and was installed at one of three factories in west Kenya**

In Kenya, satellite partnership has moved well beyond legume producers, but rather extends along the entire value chain in a manner that assures quality farm inputs and drives greater demand. We see our outreach co-operators respond to this situation by extending the numbers of participating farmers beyond the targets set and supported by the program, opening new opportunities through revolving funds and marketing collection points for all members. This is an important spin-off from the project. At any point in time, a single outreach co-operator may work and serve several categories of farmers, including first-time BNF technology testers, 'progressing farmers' receiving inputs on credit that pay back in soyabeans, Promasidor outgrowers receiving credit that is deducted from deposited payment and farmers that grow soyabean but have never worked directly with N2Africa but rely on its market collection points. In the end, and towards the end of the project, the difference between outreach co-operators and satellite partners becomes fully obscured and what counts, at the end, is how the outreach co-operator and the satellite partners is empowered to continue with its activity independently.



## 3 East DR Congo

### 3.1 Outreach activities in satellite sites

#### Women for Women International

Woman for Women (W4W) International operates in both South and North Kivu Provinces and target women, particularly those from post-conflict areas. Women for Women is a satellite partner in the true sense. They operate in areas outside the project action sites and are fully self-funded. They operate in two sites; one is the locality of Mwengerera (Walungu territory, Butuza site) and the other is Katana center (Kabare territory, Katana site). Women for Women are very interested in the innovative N2Africa rhizobium technology and wish to continue with the dissemination of the technology after the project comes to an end. Hence, they wish to have their staff (engineers and facilitators) trained by the project on mixed-cropping systems especially and rhizobium technology. So far they have conducted demonstrations on intercropping cassava with soyabean, cassava with common beans and maize intercropped with soyabean. They train farmers in the use of inoculants and fertilizer, and on post harvesting techniques and they conduct field days. So far W4W has been able to reach 2057 women farmers over two season divided over the sites and seasons as indicated in the table below.

**Table 1: Number of women farmers reached by W4W during the 2012 seasons in DR Congo**

Locality	No. women farmers reached during Feb-Apr '12 season	No. women farmers reached during Oct '12 – Jan '13 season
Mwengerera (Walungu)	810	412
Katana center (Kabare)	415	420

#### Satellite activities by PAD, SARCAF and DIOBASS

The outreach partners PAD, SARCAF and BIOBASS added sites to their program in 2012 and 2013 that qualify as satellite sites. The sites are operated through their co-operators (no data for 2012). Activities included demonstration plots, exchange visits, field days, and training on the use of inoculants and fertilizers and post harvest technology. Activities in DRC Congo are either along the north axis (north of Bukavu, including the villages Kalehe, Murhesa and Mumosho), where the soils are more fertile and where the focus is on soyabean predominantly, or along the south axis (south of Bukakavu, and including places like Ikoma, Burhinyi and Mulamba) where the focus is on beans, using inoculant and P fertilizer. Participation of women in the project remains high, with 65% of the

**Table 2: Satellite sites and number of farmer reached by outreach partners in DR Congo**

Co-operator/ outreach partner	Location	Number of farmers reached
2013		
CODEBU	Kasila	124
SOLF	Mukwija	471
ACDERU	Bushushu	600
CLD-Luzira	Luzira	240
<b>Total</b>		<b>1435</b>
2012		
SARCAF	Miti (Kabare)	NA
	Muku (Kabare)	NA
PAD	Lubona (Walungu)	NA
DIOBASS	Kabamba (Kabare)	NA



participants (farmers being reached) being women. Of the farmers that participated in the exchange visits 82% were women.

### Research and Outreach activities in satellite sites by WUR

The Wageningen University (Social Science group) started a project to research the impact of different technology dissemination strategies on adoption. The project started in 2013 and builds on the work of the N2Africa project. The project will continue disseminating legume and BNF technologies promoted by N2Africa through the outreach partners, but while doing so test various alternative dissemination strategies. The project will be implemented both north as well of south of Bukavu, partly covering the same mandate areas and action sites of the N2Africa project, but also including new sites (notably in the Ruzizi plains, towards Lake Tanganyika). Activities will be carried out in a total of 80 villages. So far 980 farmers have been reached in 2013 (distributing 56kg soyabean SB24, 224kg soyabean PK6, 722kg common beans (RW10), 17kg common bean (HM21), 407kg common bean OPV, 20,865 cassava cuttings and 1.2kg of inoculant and 3,662kg NPK fertilizer).

### 3.2 Partnerships for input distribution

A new DFID project in Bukavu has identified five village based agro-dealer shops (small kiosks) to stock and sell inoculants. They have been supplied with 400 packets (of 100 g each) of inoculants (LegumeFix) obtained from Legume Technology, UK, with a packet going at USD 3, the price that most farmers indicated they could afford. However, the challenge remains on how to get inoculants to Bukavu, given the high importation cost from potential sources of quality inoculants like UK and Kenya. Improving inoculants production and quality at RAB-Rubona in Rwanda could be a possible solution for this challenge. Lately, a leaflet has been added as part of inoculants package that is obtained at village-based agro-input shops, selling the inoculants through a partnership between CIALCA and N2Africa.

N2Africa in collaboration with an IFAD funded project facilitated initiatives linking farmers to input 'kiosks'. This initiative aimed at scaling up and achieving sustainability in provision of agricultural inputs. Fertilizers were made available to farmers by stocking in kiosks in nearby market centres in Walungu and along the Katana axis (north of Bukavu), by linking the kiosks to ADEVS (an agro-dealer specialized in the importation of fertilizers in the South and North-Kivu). This resulted in farmers buying 2,850 kg of fertilizers in



**Figure 10: ICODEI, a community based organisation in Birava along the north axis of the DRC mandate area that has ventured into seed multiplication (photo J. Huising, 18/05/2013)**



**Figure 9: The community based organisation ICODEI consists mainly of women, like so many in this area in DRC (Photo J. Huising, 15/05/2013)**



packages of small quantities, from 20 trading centres (Murhesa, Birava, Bwirembe, Miti, Mumosho, Kavumu, Mushinga, Nyangezi, Ikoma, Cagombe, Kamisimbi, Mulamba, Nduba, Kamanyola, Mukwija, Bushushu, Luzira, Idjwi, Katana and Kasika). The quantities of fertilizers sold per market centre ranged from 100 kg to 300 kg, though demand outstripped the supply. The committees managing the kiosks were trained on management aspects to enable them run the kiosks as viable enterprises in the future. N2Africa produced a leaflet on soyabean inoculants in collaboration with CIALCA team for the purpose of creating awareness on the use of inoculants among farmers. The leaflet is part of inoculants package that is obtained at village-based agro- input shops selling the inoculants.

### 3.3 Seed multiplication

N2Africa in partnership with the local research institution INERA-Mulungu and outreach partners SARCAF, DIOBASS and PAD, initiated community-based seed production groups in 13 action sites and 4 satellite sites to address the general shortage of seeds. In this manner an informal seed system is established which before was practically non-existent. Promotion of seed production has become part of the regular delivery and dissemination activities. Through this approach, about 66 tons of soyabean seeds of various varieties have been produced. Many seed growers, majority being women groups, are taking advantage of the availability of inoculants and fertilizers to improve soyabean yield and securing large fields for seed multiplication through land consolidation. Due to lack of reliable outlets, the produced seeds are marketed at seed fairs organised by the project partners, during field days, and at various local markets where stands are being erected.



**Figure 11: A few bags a seed produced by CDC, a co-operator; the seed being inspected by IITA staff/N2Africa before it is used for further dissemination**

The seeds are being stored and inspected by the N2Africa team that will use the seed for its own dissemination campaign.

### 3.4 Satellite activities in collective marketing and creating market linkages

#### Collaboration with the IFAD funded project

N2Africa collaborated with the CIAT implemented and EU/IFAD-funded "Great Lakes Project" in DRC as well as in some other countries (e.g. Zimbabwe and Malawi). The project aimed at increasing smallholder farm productivity, income and health through widespread adoption of Integrated Soil Fertility Management (ISFM) in the Great Lakes Regions and Southern Africa through disseminating of proven ISFM technologies and knowledge, by the deployment of extension materials, provisioning of seed and inorganic and organic inputs, strengthening capacities of farm households to access farm inputs, market commodities and improving household nutrition. They reported to have reached 6,083 households directly, but this may overlap with the N2Africa farmers to some extent.

N2Africa partnered with the project for training of N2Africa farmers on nutrition, processing and formation of farmer-marketing groups to sell surplus grain. This collaboration also enabled N2Africa to expand activities to new sites where the ISFM project is operated.



**Table 3: Satellite sites in DRC where N2Africa collaborates with the IFAD project in establishing farmer-marketing groups.**

Sites	Groupment	Territory	Locality
Kasika	Kasika	Mwenga	Kasika
Idjwi	Movu	Idjwi	Movu, Kitarama
Mukwinja	Mukwinja	Kalehe	Mukwija, Nyabwibwi

N2Africa continued training of farmers and organizing them in collective marketing groups after the IFAD project closed. Farmer cooperatives established collection centres at Ikomo, Miti, Mumosho, Bwirembe, Birava, Walungu, Mulamba, Bughorhe and Murhesa collecting in total 26.5 tons of soyabean and 28.5 tons of beans. The collected grains are sold three months after harvest at a price of USD 1.2 and USD 1.5 per kg of soyabean and beans respectively (compared to USD 0.50 for soyabean and USD 1.00 for beans at harvest time). The respective farmer cooperatives get initial capital from microfinance institutions MECREBU, COOPEC FOMILAC, COOCEK KIVU, and COOPEC Nyawera to facilitate the buying. The local market easily absorbs all the soyabeans and beans produced; some (soyabeans) finds its way to Rwanda.

The project devoted its attention also to post-harvest handling and storage, demonstrating the use of the Purdue Improved Cowpea Storage (PICS) bags and distributing tools used in the post-harvest activities: i.e. the GrainPro hermetic (PICS) bags, moisture meters, aflatoxin testing kits, maximum - minimum thermometers, and balances. Protocols for the measurements and procedures were developed by CIAT at Kalambo station. Measurements for moisture content, temperature, pest damage, moulds, malformation, weight loss and the presence of aflatoxin in the grains were taken under different storage bags/pots (Figure 12) to assess the effectiveness of different storage methods on the quality of stored grains.



**Figure 12: Polythene and PICS bags storage demonstration at a household level (left), and measurement of presence of aflatoxin in stored grains (right)**

Data on the effects of the different storage methods were collected between February to July 2012 at nine locations in DRC, which included both household level and aggregate stores. Results showed that there was no presence of aflatoxin in any of the sites, but differences in grain weight loss were observed in some cases. For instance, tests done along the Katana axis (two locations in Miti and Birava) showed small soyabean weight losses of 0.1 g (about 6%) in Birava from 100 randomly selected seeds after 5 months of storage, for both synthetic (ordinary) bags and the PICS bags. The





weight losses were even more marginal (about 2%) in Miti for both types of storage bags. Insect attacks and grain malformations were not pronounced.

### 3.5 Processing and value addition

The IFAD project conducted activities on processing and value addition as well, that are considered complementary to the N2Africa project activities. A two-pronged approach was used to deliver training to the households in processing of soyabeans. First was the Training of Trainers in December 2011, and the trainees then train household members directly. More than 400 participants were drawn from across all action areas and taught on importance of legumes in nutrition and trained in preparation of different recipes. For the small scale processing of soyabeans the project used small and practical machines adapted to local household conditions ('machines à hacher' – mincing machine).

A Vitagoat was established in Bukavu and started operation in January 2012, after a trial period of one month. The Vitagoat is used to produce soymilk and soya flour; it does not require electricity (pedal operated) and performs four functions: grinding, water pumping, generating steam and pressure-cooking and filter pressing. The use of steam-injected pressure-cooking is up to 10 times more energy-efficient than traditional open stove cooking. Production has continued increasing over time as more awareness of the products is being created. The net monthly income from the Vitagoat has been \$235, with a six-month total net income of about \$1,400. The main limitation has been the low awareness and demand for the soymilk, yoghurt, cakes and other products. However, an effort is being made to advertise the products, so that the Vitagoat can be used at full capacity.

In the first year of operation 7,222 litres of yoghurt and 3058 doughnuts were produced, generating revenue of \$5,890 in total, with production cost amounting to \$3,521.3 (variable costs \$2,181.3; fixed costs \$1,340). Details are provided in table 7. The production was rather varied through the year and efforts should be undertaken to increase demand.

**Table 4: Monthly production of soya yoghurt and soya doughnuts and income and profits generated from the Vitagoat machine in Bukavu, DRC.**

Period 2012	Produced quantity		Monthly income (\$)	Monthly expenses (\$)	Net profits (\$)
	Yoghourt (litre)	Doughnuts (pcs)			
January	270	710	367	194	173
February	238	414	232	150	82
March	270	902	272	220	52
April	515	911	462	326	135
May	75	-	60	67	-7
June	570	-	456	483	-27
July	945	-	756	840	-84
August	1,410	-	1,043	212	830
Seven	2,133	-	1,596	495	1,101
October	276	121	232	42	190
November	522	-	418	493	-75
Total	7,224	3,058	5,890	3,521	2,370

As a result of the positive impact of N2Africa other initiatives are being undertaken. CDC is trying to attract some alternative sources of funding for the rehabilitation of the facility for soyabean oil production. CDC is hopeful that the postharvest transformation will ensure sustainability of the innovative legume-rhizobium based cropping systems and pull subsistence farmers out of their current state of "Despair to Hope".



**Figure 13: An abandoned facility for the processing of soyabean oil that CDC is going to restore.**



In East DRC the satellite activities and sites are very much associated with development and research projects that come on board. These activities, like in Kenya, do extend beyond the dissemination of the legume and BNF technology and encompass the various activities along the value chain, including input supply, marketing and value addition and processing. The fact that these activities depend on project funding raises some concern about the sustainability. At some point these interventions need to result in sustainable economic activities. Development partners have an important role to play to secure funding and support for the somewhat longer term. This seems to provide an argument for the further strengthening and capacity building of the NGOs.



## 4 Ghana

### 4.1 Outreach activities and value chain development in satellite sites

#### **ADVANCE – Agricultural development and value chain enhancement**

The collaboration with ADVANCE (Agricultural Development And Value Chain Enhancement) came about more or less by chance. ADVANCE attended a planning meeting of the N2Africa project in March 2011, where linking farmers to markets was on the agenda. In attendance was a large representation from non-governmental organizations that allowed establishing initial contact and exploring opportunities for further collaboration. ADVANCE is a USAID-funded project that builds capacity of value chain actors along the supply chains of rice, maize and soyabeans. It facilitates linkages between various value chain actors to help them upgrade and expand their businesses. Also in attendance were representatives of Kharma Farms, Candell company, Savanna Seeds Company and IFDC (International Fertilizer Development Centre).

The N2Africa- ADVANCE partnership has tremendously boosted N2Africa's work in the target zones. In this market facilitation approach 6,363 soyabean farmers are linked to markets, finance, inputs and equipment services and information through the relatively larger nucleus (commercial) farmers and large traders (aggregators), who have the capacity to invest in these chains. N2Africa provided Training-of-Trainers to nucleus farmers and out-growers, provided technical expertise in the use of inoculants at collectively 50+ demonstration sites over the 3 years, and facilitated the importation of inoculants to ADVANCE project participants – agro-dealers and farmers. ADVANCE, through its partnership with N2Africa, made 107 kg of inoculants available to its nucleus and out-grower farmers in northern Ghana. ADVANCE's promotion of soyabean inoculants has resulted in increased awareness among agro-input dealers and commercial farmers of the importance and use of soyabean rhizobium inoculants and increased sales of inoculant. Two agro-input companies (Kaakkyire and Antika Agro-chemicals) are investing in importation and distribution of inoculants into the Northern Ghana market. In the 2012/13 year, 6,017 metric tons of soyabean was sold to end market processors, purchased from smallholders at the farmer gate at the estimated value of \$1,104,748.

In northern Ghana, ADVANCE has a wide reach, working now with 48,648 farmers, 478 producer, trade and business associations, 112 nucleus farmers with out-grower schemes, 106 large end-buyers/processors, 131 agro-input dealers, 46 financial institutions and 26 radio stations and 37 mechanization service providers. The project provides great opportunity to further expand legume production in northern Ghana.

### 4.2 Strengthening market linkages

The market linkages for soyabean, from the farm to the industrial processors such as Ghananuts and 3KD, are being strengthened through the marketing platform developed by Esoko Ltd. Farmers obtain regular alerts on market prices of legumes and agro-inputs, weather information and information on potential buyers within their region. A total of 1000 farmers will have migrated onto this marketing platform by the end of the project. However, this number could be higher if mobile phone accessibility was improved.

Field days are an important mechanism in the dissemination of the legume and BNF technology. These days are intended to attract large crowds from various communities and development partners in the area and should be much more than just an exchange visit of farmers from the project. These events should be used to increase exposure of the project, by inviting dignitaries and government officials and being covered on radio or television, as was the case in Ghana. In total of 65 farmer field days were conducted across the three mandate areas. In collaboration with KNUST, Urbanet conducted 10 field days, and EPDRA and ACDEP both conducted 9 field days. Advance tagged field



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days in 7 communities selected from the 65 communities across the three mandate areas. Together SARI and MoFA conducted another 30 field days in Upper East and West regions. The average attendance per location was 58 farmers with 46% being women.

The collaboration with ACDI/VOCA (in the ADVANCE project) has proven very beneficial to both parties, for N2Africa to increase its reach and for ACDI/VOCA to gain access to improved technology. It may provide a model for the way N2Africa aims to collaborate with its development partners for the second phase of the project. However, the question remains how such partnership and collaboration is shaped for the longer term. N2Africa needs to be embedded into an institutional context that allows continuation of delivery of information services and capacity building support.



## 5 Zimbabwe

### 5.1 Legume technology dissemination in satellite sites

#### Satellite activities of LDGA, CADS and CTDO

The Lower Guruve Development Association (LGDA), one of N2Africa's outreach partners in Zimbabwe has open satellite sites in Guruve and Mbire district upon request of farmers. The satellite sites in Guruve district relate to Wards 1, 4, 6, 8 and 22 and in Mbire district to wards 3, 12, and 17. A ward comprises of an average of 2000 farming households. LGDA is community-based organisation and as such all research and development projects that are implemented by the organisation are reported to the community. The association operates in three districts namely Guruve, Mbire and Muzarabani. LGDA reported on N2Africa activities in the original six wards where it started operations at the Annual General Meeting, which led to ward councillors of other wards to request for the project to include their wards. However, not all requests could be honoured due to lack of the manpower. The seven satellite wards sites in Mbire district were then chosen by the partner organisation. But representatives from nearby wards were invited to field days and dry shows and this allowed for diffusion of technologies to other wards. Guruve district has great potential for sugar bean production and because of this, farmers in the district requested training on production and marketing of the crop. In Mbire district, farmers were very interested in accessing improved groundnuts and cowpeas seeds. Farmers in Ward 1 in Guruve only received training on post-harvest handling, marketing and 'farming as a business', but not on any of the N2Africa legume technologies. In the 2012-13 season, about 2300 farmers were reached in Guruve and Mbire districts in total.

The Community Technology Development Organisation (CTDO) is implementing other projects that support legume production. In the 2012-2013 agricultural season CTDO supplied 5 tonnes of soyabean seed to farmers in Chegutu and Goromonzi districts. The inputs were supplied through a project supported by the Germany Protestant Churches (EED). The soyabean seeds were distributed to 400 farmers with each beneficiary receiving 12.5 kg of seed and rhizobial inoculants. The beneficiaries were not part of the farmers in the N2Africa Project. The organisation also links soyabeans farmers with Olivine Industries (one of the major buyers of soyabeans in Zimbabwe).

### 5.2 Satellite activities in value addition and processing

#### Cluster for Agricultural Development Services (CADS)



**Figure 14: Farmers from Murehwa district (ward 28) showcasing value added dishes of the four legumes (soyabean, sugar bean, groundnut, cowpea)**

In Goromonzi district, Cluster Agricultural Development Services (CADS) has expanded into 5 satellite sites (wards 1, 3, 4, 15 and 16), bringing in expertise in value addition and processing. This expansion has been made possible by exploiting synergies with CADS' other projects. The Community Technology Development Organisation (CTDO) has added satellite activities in Murehwa and Chegutu districts (ward 28 and ward 27 respectively). In Makoni district, AGRITEX added two new sites (ward 26 and ward 27). CADS, CTDO and LGDA are part of a network of nine NGOs called the 'Zimbabwe Adding Value to Sustainable Agriculture Produce'

(ZAVSAP). ZAVSAP works with its members to improve the livelihoods of small-scale farmers,

focusing on areas of food processing, nutrition and marketing. The network organises training for its staff and lead farmers in good nutrition and preparation and processing of healthy foods and shunned crops such as small grains, sweet potato, cassava and legumes. ZAVSAP organises an annual "processed products" fair in Harare where farmers showcase their agricultural products and stakeholders visit the different stands to buy these products (see also N2Africa Podcaster 9 pp. 7-8). The three organisations have promoted their value added products from legumes through this platform.



**Figure 15: Examples of value added products being promoted (from left to right, top to bottom: Cowpea flitters, Soya buns, Soya bread, Bean pies, soya milk and Soya coffee – courtesy CTDO)**

The IFAD funded project (2010-2012) was implemented in three of the districts where N2Africa project operates. It managed to procure and distribute two manual groundnuts shellers to ease labour constraints for women who participate in value addition on groundnuts. The shellers were distributed in Guruve and Mudzi districts. In Mudzi, farmers appreciated the shellers very much since they are selling the shelled groundnuts.

### **5.3 Marketing networks, field days and dry shows**

During the 2012-2013 season 36 farmers in Guruve district were linked to soyabean supplier Feya Feya, who provides farmers with soyabean seed, fertilizer and inoculants. Four farmers received soyabean seed, fertilizers and inoculants, while the other farmers received only soyabean seed and inoculants.

After farmers in Wards 4, 6, 8 and 22 of Guruve district were trained on collective marketing by N2Africa personnel and LGDA, they mobilised themselves into marketing groups where they managed to gather 20 tonnes of sugar beans, which they sold to Blackerberry and Frustas.

Marketing networks have also been revived in Mudzi district, where they are working with Zimbabwe Farmers Union (ZFU) to market their groundnuts in groups. ZFU is membership organisation, which assists farmers in accessing inputs either on discounted prices and/or credit through bulk purchases. In 2013, a group of 40 farmers mobilised 3.5 tonnes of groundnuts, which they sold to Frustas in Harare.



Field days and dry shows have been used as platforms for reaching out to farmers who are not engaged in the project in Zimbabwe. Field days were conducted during the months of March to April while dry shows were conducted in July and August. Partner organisations are responsible for hosting the field days in the different satellite sites. The table below shows the lists of field days conducted within the season. All the new sites added have since hosted field days.

**Table 5: Field days organized in satellite sites in Zimbabwe**

Partner Organisation	District	Number of field Days	Participants				
			Numbers			Percentages	
			Male	Female	Total	Male	Female
LGDA	Guruve	6	246	274	520	47	53
	Mbire	3	162	136	298	54	46
CTDO	Chegutu	3	98	203	301	33	67
	Murehwa	5	255	527	782	33	67
Agritex	Makoni	3	144	218	362	40	60
Agritex	Hwedza	3	160	220	380	42	58
Agritex	Mudzi	3	99	201	300	33	67
CADS	Goromonzi	11	1295	2555	3850	34	66
Total			2459	4334	6793	36	64



**Figure 16: Picture of field day in Goromonzi, 2013 (courtesy CADS)**

From the survey that was conducted in 2011/12, it is also worth noting that partner organizations take a lead role in inoculant distribution as shown in Table 6. The farmers interviewed were engaged in the N2Africa project in the 2010/2011 agricultural season. They indicated that they received inoculants from different sources, the most prominent source being our partner organisations working in the districts. This may mean that Agritex and NGO partners are taking a leading role in the promotion of inoculants to farmers.



## 5.4 Post harvest handling and marketing

In the 2012/13 season, four manuals developed and tested by the IFAD funded project were distributed by the Farm Liaison Officer of N2Africa. The manuals covered topics in post-harvest handling and storage, agricultural marketing and farming as a business. The manuals were distributed in the seven N2Africa mandate areas (Table 7). In the same 2012/13 season, approximately 1200 copies of legume production notes were compiled, reproduced and distributed. A few copies of pest management manual were also made available to N2Africa for distribution to farmers.

**Table 6: Source of inoculants per district (Zimbabwe)**

	Chegutu	Goromonzi	Makoni	Murehwa
Number of farmers interviewed	6	21	22	18
Organization <sup>1</sup> (Agritex, CTD or CADS)	50%	29%	59%	39%
Agro Dealer/wholesale shop	0%	14%	9%	11%
Bought from another farmer	0%	5%	0%	0%
Given by other farmers	17%	10%	5%	11%
Previous season	0%	0%	14%	0%
National tested seeds	33%	0%	0%	0%
SPRL Marondera	0%	5%	0%	0%
blank	0%	38%	14%	33%

<sup>1</sup> Other than N2Africa

**Table 7: Distribution of training materials on 'post-harvest handling and storage', marketing and 'farming as a business' to partners**

Partner	Post-Harvest Handling	Marketing	Farming as a business
Agritex Mudzi	150	150	150
Agritex Hwedza	150	150	150
Agritex Makoni	150	150	150
Lower Guruve Development Association	150	150	150
Cluster for Agricultural Development Services	150	200	200
Community Technology Development Organisation	300	200	200





## 6 Malawi

### 6.1 Strategic partnerships and outreach activities in Malawi

Malawi operates in 66 sites in total, of which 9 are considered to be satellite sites. The same outreach partners that N2Africa works with in the project sites operate these satellite sites. Table 8 provides an overview of the location of the sites, with in brackets the number of satellite sites. The outreach activities in the satellite sites are the same as in the regular sites and comprise the promotion of legume and inoculants technologies through demonstration, field days and farmer tours. Farmers in satellite sites are also linked to legumes markets and trained in legume processing. The satellite sites are fully integrated within the N2Africa project with the difference that N2Africa did not provide the funds for the operation of these sites and they were as such also not include in the MoU with the partner organisations. It is therefore difficult to report separately on the satellite activities.

**Table 8: Overview of the N2Africa action sites including the satellite sites (in brackets) in Malawi.**

District	Partner	Sites	No. of sites	GPS Coordinates	
				Longitude	Latitude
Lilongwe	DAES <sup>1</sup>	Ngwangwa EPA	3(1)	13.77306	33.63972
	WV <sup>2</sup>	Nkhoma/Chilenje ADP	8(0)	14.10035	34.09323
	NASFAM <sup>3</sup>	Lilongwe North AMC	2(1)	13.82639	33.60306
Mchinji	NASFAM	Mchinji AMC	2(0)	13.52311	32.95585
		Mlonyeni Buwa ADP	2(1)	13.87475	33.02477
Dedza	DAES	Linthipe EPA	15(3)	14.20380	34.02135
	WV	Tchesa/Chitundu ADP	8(3)	14.00589	34.15538
	DAES	Makwangwala	13(0)	14.82569	34.81025
	DAES	Makande EPA	3(0)	13.76221	34.39699
		Chinguluwe EPA	3(0)	13.68902	34.36889
	WV	Lipiri ADP	1(0)	13.62263	33.57802
		Kafulu ADP	1(0)	13.55565	33.49440
		Kasangazi ADP	1(0)	13.37406	33.73739
	CADECOM <sup>4</sup>	Nkhamenya Zone	4(0)	12.56785	33.50145
<b>Total</b>			<b>66</b>		

<sup>1</sup> Department of Agricultural Extension Services

<sup>2</sup> World Vision Malawi

<sup>3</sup> National Smallholders Farmers' Association of Malawi

<sup>4</sup> Catholic Development Commission in Malawi (co-operator for Catholic Relief Services –CRS)

Table 9 specifies the field days organized and number of participants (up and until April 2013). The field days organized by DAES in Dedza and World Vision in Lilongwe were aired on the radio (state radio and one private radio station).

World Vision Malawi reached 5258 farmers households in the 2012/13 season with 280 lead farmers. N2Africa does not cover the operational cost fully. WV uses community-based organizations to implement the activities on the ground, focusing on transformational development, relief and advocacy in disseminating technologies to vulnerable communities. WV has a Development Facilitator in each Agricultural Development Program (ADP) planning area, where they work with the government extension staff on the ground. Satellite farmers (approx. 18 per lead farmer) are reached through sensitization meetings, trainings and field days organized by Lead Farmers. WV established a Village Savings and Loans program, which aims to economically empower women, and consideration is given to targeting women and female-headed households when distributing inputs. Although WV uses its existing groups, some Marketing Committees have been established under the N2Africa umbrella for



**Table 9: Number of field days and participants in Malawi (including satellite sites)**

District	Partner	Total	Male	Female	% of Female	No of Field Days
Ntcheu	DAES	1,277	552	725	57	9
Kasungu	Catholic Relief Services	3,098	1,247	1,851	60	18
Salima	Makande EPA	710	395	315	44	5
Salima	Chinguluwe EPA	546	293	253	46	6
Dedza	World Vision	1,098	618	480	44	12
Dedza	Linthipe EPA	2,064	923	1,141	55	19
Lilongwe	World Vision	542	301	241	44	8
Lilongwe	Mngwangwa EPA	678	187	491	72	5
Lilongwe	NASFAM	127	66	61	48	2
Mchinji	NASFAM	407	155	252	62	4
Mchinji	World Vision	983	387	596	61	13
Dowa	World Vision	1,053	358	695	66	12
Salima, Dowa, Kasungu & Mchinji	AISAM <sup>1</sup>	156	95	61	39	7
<b>Total</b>		<b>12,739</b>	<b>5,577</b>	<b>7,162</b>	<b>56</b>	<b>120</b>

<sup>1</sup>. Agri-input suppliers association of Malawi

effective marketing activities within the ADPs. N2Africa assisted in revamping inactive groups and these are now involved in production, processing, utilization and marketing of legumes, poultry farming, rabbit production, bulking milk and produce for marketing. Group cohesion varies according to maturity of association; those that have been in existence the longest seem to be the most stable. Very sustainable groups have funds in their accounts and are empowered to stand on their own. Legume technologies are integrated in WV's own program activities using the lead farmers and targeting transformational development in areas of education, health and nutrition, food security and child protection, through the lead farmer approach. In this way the promotion of legume technologies is secured beyond the lifespan of the N2Africa project.

CRS is another development partner in the project, with CADECOM as the implementing agency in Kasungu and Mzimba districts. Two projects are implemented: the SMART project and the Market Access project. The SMART project aims to bring about agricultural transformation, saving mobilization and market linkages with emphasis on grain legume value chains (as influenced by the N2Africa project). The Market Access project focuses on post harvest handling, quality management and building market linkages. During the last season 3420 farmers were reached with no financial support from the N2Africa project. CADECOM has incorporated legume technologies into their own programs and tries to ensure sustainability of the project intervention by focussing on access to inputs (inoculants), seed multiplication, moving beyond demonstration through scaling out legume cultivation and providing credit facilities and by putting more emphasis of linking farmers to markets. CADECOM is moving more towards a resource centre function, organizing farmers into associations. Five smallholder farmers associations were formed during the 2012/13 season, for which N2Africa provided the legume processing and marketing training. The associations are renting a warehouse to store the grain for marketing purposes. As of June 2013 they had bulked 413 metric tonnes of soyabean. Unfortunately prices have dropped since. CADECOM qualifies fully as a satellite partner, though their activities are completely integrated and they form part of the reporting structure. CADECOM provides for sustainability of the project activities.

NASFAM operates through a slightly different structure. It has 43 member associations representing 1000,000 smallholder farmers. N2Africa activities are implemented by extension officers based at each association, but still use is made of the lead farmer model for the dissemination of the



technology. They aim to mainstream gender in their programs. Seed multiplication is done through the Association Seed Multiplication activities. NASFAM has embraced legume technologies as result of interaction with the N2Africa project. NASFAM does processing of legumes themselves and they market a number of legume products to the benefit of N2Africa farmers.

More recently Agro-Input Suppliers Association of Malawi (AISAM) became involved with the project, in first instance to discuss the importation and distribution of inoculants through their network. At this point of time they are one of the prospective partners to embark upon commercial inoculant production in collaboration with DARS. AISAM has been involved in the marketing of legume seed through partnership with ICRISAT and IITA and may venture into legume seed production as part of the effort and government supported initiative to improve the input supply to smallholder farmers aiming to reduce poverty and hunger in Malawi.

## 6.2 Linking beneficiaries to output markets

In order to create market linkages, marketing awareness meetings were conducted targeting representatives of Marketing Committees. The meetings aimed at creating awareness about the commodity exchange systems (both the AHL Commodities Exchange (AHCX) and the Agricultural commodities Exchange of Malawi (ACE), and explaining how these work. As a follow up, a visit to the ACE was organized. Table 10 specified the number of lead farmers that attended the marketing awareness meetings and table 11 gives the numbers of Marketing Committee members that visited ACE.

**Table 10: Number of Lead Farmers who attended marketing awareness meetings**

Date	District	Partner	Site	Lead Farmers		
				Total	Male	Female
15th April 2013	Dedza	DAES	Linthipe EPA	20	18	2
16th April 2013	Dedza	WV	Tchesa ADP	18	13	5
17th April 2013	Ntcheu	DAES	Bilira EPA	11	7	4
18th April 2013	Salima	DAES	Chinguluwe EPA	10	5	5
19th April 2013	Salima	DAES	Makande EPA	6	2	4
8th May 2013	Kasungu	CRS	Nkhamenya	56	21	35
<b>Total</b>				<b>121</b>	<b>66</b>	<b>55</b>

**Table 11: Number of Marketing Committee Members who visited ACE**

Date	District	Partner	Site	Total	Male	Female
6/5/2013	Dedza	DAES	Linthipe EPA	20	16	4
6/5/2013	Dedza	WV	Tchesa ADP	10	8	2
7/5/2013	Ntcheu	DAES	Bilira EPA	9	7	2
7/5/2013	Salima	DAES	Chinguluwe EPA	10	6	4
7/5/2013	Salima	DAES	Makande EPA	6	3	3
<b>Total</b>				<b>55</b>	<b>40</b>	<b>15</b>

In conclusion, N2Africa in Malawi has worked in 66 sites, through strategic partnerships with NGOs, government institutions, farmer associations and agro-dealer associations. In Malawi satellite activities are fully integrated into the project and there is no separate reporting structure for these activities. Nevertheless these satellite activities have helped in scaling out dissemination activities and in reaching a larger group of farmer households. Through the adoption by these partners of these successfully demonstrated legume and BNF technology and by making these part of, and integrating



these, in their own programmes a foundation has been laid for further advancing legume and BNF technologies and the sustainable impact of the project in Malawi.



## 7 Nigeria

### 7.1 Dissemination of legume technologies in satellite sites.

N2Africa/SG2000 collaboration succeeded in demonstrating the positive effect of inoculants on soyabeans and this is now a new, proven technology for soya production in farmers' fields. SG2000 is now demonstrating the technologies in three Local Government Areas (LGA) of Kaduna State under the USAID/MARKETS II soyabean value chain project, where SG2000 serves as a service provider. They are targeting to reach 1500 farmers. The MARKETS II project aims to increase rural incomes for the very poor and supports the U.S. Government feed the Future Initiative to enhance the agricultural sector, by strengthening farming and develop agribusiness focusing of commodities like rice, sorghum and cassava. So far soyabean has not been a target crop, but MARKET II is likely to promote the crop and the use of inoculants in the state.

In addition, inoculants have been used for soyabean seed production in Jigawa for 2013 season under the routine SG2000 extension activities. SG2000 is at the same time expanding their activities in their mandate area, which is Kano state. They will continue disseminating legume and BNF technologies, irrespective of the support of N2Africa. A major challenge now is the supply of the inoculum in



**Figure 17: Demoplot under MARKETS II indicating inoculated (left) versus un-inoculated soyabean (right) in Kaduna State**

commercial quantities, as farmers have started asking where they can purchase the product.

As the flagship project of USAID's Agricultural Transformation Program, MARKETS II aims to increase rural incomes and support the U.S. Government's Feed the Future Initiative to enhance the agricultural sector in the Niger Delta region of Nigeria. In addition, USAID has signed a memorandum of understanding with the Chevron-funded Foundation for Partnership Initiatives in the Niger Delta (PIND) to increase agriculture-related incomes, agro-enterprise farm linkages, and participation in commercial agricultural markets by the very poor in the Niger Delta.

#### **Federal University of Technology and NSADMA**

The project engaged the Federal University of Technology of Minna (FUT Minna) as a new partner for agronomy research, together with Niger State Agricultural Development and Mechanization Authority (NSADMA) for D&D in the 2012 season. Niger state became, herewith, the third state in Nigeria where N2Africa is implementing its activities.

#### **AGRA Soil Health Program in Nigeria**

The Soil Health Program (SHP) funded by AGRA can be considered a satellite project of N2Africa. The same partners implement the projects. AGRA provided a grant of \$800,000 to Ahmadu Bello University for increase food security and provide incomes for small holder famers in Northern Nigeria through the up-scaling of cereal-legume cropping systems. The project finished in 2013. Similarly a grant was given to Kano State Agricultural & Rural Development Authority to improve the productivity and sustainability of small holder millet & sorghum based systems in the dry savannah of Nigeria



through ISFM practices and better access to markets. In so far intercropping with legume crops is part of the millet & sorghum based systems we consider this a satellite activity. The latter received project funding of \$600,000.

## 7.2 Input distribution and training of Agro-dealers

During the 2013 season, N2Africa has partnered with the Seed Project Co Ltd in Kano for the distribution of LegumeFix rhizobia inoculants among smallholder farmers under the agreement that the project supplies Seed Project Co with inoculant at no cost, with the commitment that Seed Project Co invests in storage facilities for sustainable supply to emerging networks. The funds used for the inoculants are intended as matching funds; that is the funds generated from the sale are to be invested by Seed Project Co in the importation and distribution of inoculants for the following season. Seed Project Co were considered the right partner to engage in inoculant distribution, given that it operates in the three N2Africa mandate areas: Kano, Kaduna and Niger.

The process of rhizobial inoculants importation initiated in the running season paved for agro-dealers training seminars. Part of the agro-dealers who attended the training were recommended by the Seed Project as market network members, while others were selected by the N2Africa's traditional partners (SG2000, KADP and NAMDA) at the local level (EAs), see table 12 for details.

**Table 12: 2013-Training of agro-dealers in Kaduna, Kano and Niger States /Nigeria**

State	Centre	Local Gov. Areas	Male	Female	Eas/APCs	Total
Kano	Kano	Doguwa; Tudun Wada; Wudil; Gaya; Bunkure; Dawakin Kudu; Garko; Albasu; Bichi; SG2000; Seed Project Co.LTD	19	0	18	37
Kaduna	Kaduna	Kajuru; Lere; Soba; Giwa; Zango Kataf; Kachia; Igabi; Kujama; Kaduna town; KADP HQ; Seed Project Co.LTD	18	2	8	28
Niger	NAMDA HQ	Paikoro; Shiroro; Kontagora; Mashegu; Magama; Paikoro; NAMDA HQ	10	0	5	15
Total			47	2	31	80

There are opportunities to integrate these activities into the IFDC led Nigeria Agro-Dealer Support (NADS) project, likewise funded by AGRA ([http://www.ifdc.org/About/IFDC\\_Articles/Agro-Dealer\\_Development\\_Projects\\_Increase\\_Farmers/](http://www.ifdc.org/About/IFDC_Articles/Agro-Dealer_Development_Projects_Increase_Farmers/))



## 8 Rwanda

### 8.1 Outreach activities in satellite sites

In Rwanda, N2Africa has 5 partners, involved mostly in technology dissemination. One is a research institution (ISAR/RAB) and 4 are non-governmental organizations (NGOs), specifically DRD, COCOF, EPR, and CARITAS. These partners are spread across all N2Africa mandate areas. These NGOs have extended N2Africa activities to other areas outside the action sites using their own funds. In addition, satellite partners were involved in promoting N2Africa technologies. These were Medicus Mundi and Behar Bedasoa in Kamonyi district, Clinton Hunter foundation in Kayonza, Kirehe, Ngoma and Gatsibo districts in Eastern province, and One Acre Fund in the Southern and Western provinces. The table below summarizes interventions in the satellite sites and the number of farmers reached.

**Table 13: Interventions in satellite sites and number of farmers reach in Rwanda**

Partner	Satellite site	No. of farmers	Activities implemented	Season
1. CARITAS Rwanda	Bugesera district (sector Juru, Ririma, Rweru, Nyarugenge)	1344	Bean & Soyabean seeds, P fertilizers, inoculant for Soyabean	2012B & 2013A
2. COCOF	Kamonyi district (sector Gacurabwenge, Mugina, Karama)	278	Bean, soyabean	2013A
3. Behar Bedasoa	Southern province, Kamonyi district (sector Ngamba)	70	Bean and soyabean, 2 demo plots established	2012B
4. EPR	Eastern Province Bugesera district (sector Gashora)	15	Bean, soyabean and inoculant	2012A
	Kayonza district (sector Kabarondo)	349	Bean & Soyabean seeds, P fertilizers and inoculant for Soyabean	2012B & 2013A
	Western province, Kamembe & Nyamasheke districts	100	Inoculant for Soyabean	2012B & 2013A
	Southern province, Kamonyi district	148	Bean and soyabean inoculation	2013A
5. Medicus Mundi	Southern province, Kamonyi district, (sector Karama)	125	Received soyabean and bean seeds to test N2Africa technologies; 2 demo plots established on Soyabean and Beans plus technical advice by FLO	2011A
6. Clinton Hunter Foundation	Eastern province, Kayonza, Gatsibo, Kirehe districts	3013	Inoculant for soyabean	2012A & 2012B
	Eastern province	1197	Inoculant for soyabean	2013 A & 2013B
7. DRD	Western province, Ngororero district	2500	New varieties of bean disseminated by N2Africa (Gasilida) for bulk production	2012B & 2013A & 2013B
8. One Acre Fund	Western & Southern province	100	Inoculant for Beans	2013A & 2013B
<b>Total</b>		<b>9239</b>		



## 8.2 Market linkages

Through Partner COCOF, almost all soyabean-farming communities have been linked to soyabean markets in southern Rwanda. Where formal market linkages are missing, like in Bugesera and Kanyonza districts, the soyabean is purchased by DUHAMIC-SOSOMA; a company that produces a blended flour of soyabean, maize and sorghum.

N2Africa has linked the project farmers to the Harvest Plus project to sell bio-fortified bean seeds to be disseminated in other regions. These farmers were trained in seed multiplication in order to become certified seed growers for the Rwanda Agriculture Board. With the establishment of Soyco oil processing plant in the Eastern province, farmers growing Soyabean have a potential market for their produce, as the needs for oil grain to feed the factory is higher than the national production.

A total of 100 farmers (20 per district) were trained by N2Africa to become certified seed growers to continue with RAB after the project end, and also to maintain seed availability within the community.

Farmers who received dissemination packages, started bulking the produce at large scale and, assisted by N2Africa partners on the ground, identified markets for their produce, being it either declared quality seed or grain. In some cases, former beneficiaries received subsidized P fertilizer from the government for the priority crops (soyabean and climbing bean) as part of the land consolidation scheme. The bean varieties promoted by N2Africa are new and high yielding compared to local varieties, and much liked by the market. A private company in the north of the country (Top Service) is collecting all the produce and selling it to WFP and other collectives. An estimated 700 tons of common bean have been collected from N2Africa beneficiaries in the northern province over the last 3 years of the project.

## 8.3 Nutrition and value addition

COCOF, through its nutritionist has trained 26 women representing the 5 districts or impact zones of N2Africa on entrepreneurship and value addition (Milestone 4.5.1); the 26 trained women were intended to embark on a mass training by the second quarter of year 3. One year after the initial training of the 26 women, the trainer and facilitator conducted an evaluation visiting all the trainees at their home area to see if they had applied what they had learned, or if there was a need to repeat the training. The evaluation team was satisfied to see that after the training, all women had been organizing demonstration campaigns on how to prepare soymilk and tofu and teach the community members at the grassroots level in their respective action sites. Several sessions had been organized whereby at least 100 individuals attended per session.

The following illustrates some of the activities undertaken: In Nyamirama, Kayonza district, one trainee (Evaste), decided to train women with malnourished children at the Nyamirama health centre. The health centre subsequently hired her. In Nyamata, Bugesera district, another trainee set up a business to prepare tofu for wedding ceremonies and in Kamonyi, two women trained decided to become nutrition advisers for people living with HIV on how to prepare soyabean products.

## 8.4 Seed multiplication of newly released soyabean varieties

N2Africa initiated contacts with SeedCo to produce seeds for the newly released varieties of Soyabean that originated from SeedCo and were tested by N2Africa in Rwanda in collaboration with RAB. The farmers who participated in the performance trials of the varieties that were released last July (Sc. Saga, Sc. Sequel and Sc. Squire) are now multiplying the seed. SeedCo will purchase the seeds for wider distribution. RAB contracted farmers to multiply another variety of soyabean that was released (SB24) and the certified seed is to be disseminated through the Soyabean program. A booklet on the newly released varieties of soyabean was prepared, but is yet to be published. A video of the launching event on 9 July 2013 will be uploaded on the N2Africa website.





## 8.5 Inoculant production and distribution

RAB is currently producing inoculants for soyabean and common bean. They are benefitting from the assistance provided by N2Africa in rehabilitating the microbiology laboratory at Rubona station, training of technicians, and provision of chemicals used in the production. Currently the lab has the capacity to produce more than 10,000 packages of 80 g per year. Since last season (2012B), N2Africa has initiated the promotion and distribution of soyabean inoculants to agrodealers in the action sites where soyabean is grown. From March to September 2013, a total of 1500 packages (along with extension message to explain how to use the inoculant) have been distributed to agrodealers for direct marketing

N2Africa has been supporting the Clinton Hunter Development Initiative (CHDI) in Rwanda. CHDI focuses on the Eastern Province, developing agribusiness and identifying large-scale business opportunities. The soya-processing plant that is nearing completion is the major focus of the initiative. The plant will contract the crop from 30,000 farmers. Farmers will have to boost their production and the use of inoculant will play an important part in that. N2Africa has supported the initiative by providing inoculant for the 2012B season and supporting the RAB facility such that it will be able to produce the required inoculant in the future (see previous paragraph). Table 14 provides an overview of the amount of inoculant N2Africa provided and the number of farmers that benefitted.

**Table 14: Inoculants provided to the CHDI-AGRA initiative in Rwanda to increase soyabean production in Eastern Province**

District	Sector	Type of farmers	Surface (ha)	Seed used (kg)	Inoculants (RB & ASOYB)* (g)	No. of farmers		
						Females	Males	Total
Gatsibo	Remera	Cooperative Caprore Intambwe	8.125	325	1300	4	23	27
	Kiziguro	Cooperative Amizero	10.625	425	1700	8	32	40
Kayonza	Murundi	Coopetu	6.25	250	1000	1	7	8
	Rwinkwavu	Cooperative COOPABIIGI	4.375	175	700	26	31	57
		Cooperative COOPAISORWA	2.5	100	400	12	28	40
	Mwiri	Cooperative Duhuzamaboko	3.125	125	500	6	16	22
	Mukarange	Gatsinzi J. Bosco Family	1.25	50	200	2	3	5
	Nyawera	Mugabutsinze Xaveri Family	1.25	50	200	1	1	2
Kirehe	Gahara	Urumuri group	18.75	750	3000	18	43	61
<b>TOTAL</b>	---	---	<b>56.25</b>	<b>2250</b>	<b>9000</b>	<b>78</b>	<b>184</b>	<b>262</b>

\* Produced by Recursos Biotecnológicos para la Agricultura y el Medio Ambiente (ResBioAGro), from Seville, Spain.

## 8.6 Post harvest handling

Post harvest handling and storage of grains constitute a major challenge for farmers. Insects are the main pest and cause of losses during grain storage. Farmers use several post-harvest technologies but most of them are not effective, expensive or present health risks due to misuse or overuse such as insecticides.

The Purdue Improved Crop Storage (PICS) is a triple layer hermetic bag developed by Purdue University. The technology was originally developed for cowpea storage, tested in West and Central Africa, is also effective for controlling the pests in other grains. The advantage of PICS bags include: 1) No pesticide is needed to store the grain, 2) the grain can be stored up to one year, and 3) the bag can be reused up to 4 years.



N2Africa initiated a study to assess the efficacy of PICS bags for storage of crops promoted by the project (*viz.* common bean, but also included maize and sorghum), in the context of improving market linkages for farmers. The study was conducted in three districts (Kamonyi, Bugesera and Kayonza) where pest infestations are usually high, for two consecutive seasons in 2012, and involved 50 pilot farmers. The pilot farmers stored grain for 6 months and moisture content and insect damage was monitored monthly. After storage germination test were carried out. The PICS bags were produced by ECO PLASTIC Ltd, Rwanda.

Results for both seasons indicate that the PICS bags effectively control insect infestation (no infestation occurred after closing of the bags). The insect incidence rate was between 0 – 4%, and germination rate ranged between 74 - 99%, but did not change over time. The variation is explained by the type of grain, with the mixture of local bean varieties showing lower germination rates compared to the improved varieties (RWR2245 and RWR 1668). The moisture content did not increase and remained between 9.2 – 11.6% for beans, and 10- 12.4% for maize, and for sorghum it was 9.1%.

At first it was difficult to convince farmers to participate in the study, but after the first seasons their doubts had subsided, and after the 2 season farmers started inquiring where to obtain the PICS bags. A survey indicated a 'willingness to pay' of 1 – 3 US\$ per bag. Local availability is a problem however.

The conclusion is that PICS bags are a suitable way of storing grain for at least 6 months, without the need for chemicals that may affect food quality, and allowing farmers to fetch a better price for their grain. The outcome of this study is that the Ministry of Agriculture (MINAGRI), through its Post Harvest Handling and Storage Task Force, has initiated a campaign to promote the hermetic bags for grain conservation, mainly maize and common bean, and a significant amount of PICS bags have been ordered from Ecoplastics Ltd. to be distributed country wide through recognized agro dealers.



## 9 Mozambique

### 9.1 Dissemination activities in satellite sites

Dissemination activities in Mozambique are carried out in partnership with Technoserve and IKURU based on memorandum of understanding (MoU) signed between IITA and the two organizations. CLUSA, another NGO in Mozambique joined as a collaborator on the D&D activities under the MoU with Technoserve.

During the 2011/2012 season, 298 demonstration plots were established. The IITA project team established 221 soyabean demo plots across the N2Africa project sites and Technoserve established 77 demo plots both within and outside the project areas. The plots demonstrated the effects of inoculation, SSP application and a combination of SSP and Inoculant on soyabean yields. Technoserve used a different approach to dissemination of legume and BNF technology than the N2Africa project. Technoserve targets emerging and commercial farmers. The demonstration plots established by Technoserve are relatively large (600 m<sup>2</sup> per plot) and occupy a total area of 0.5 ha, compared to the 100 m<sup>2</sup> per plot and total area of 750 m<sup>2</sup> per farmer's field in the N2Africa demonstrations. Technoserve provides all inputs and reimburses farmers for land preparation costs (some of which were done by tractor) and costs for weed control. This approach was expected to increase adoption rates and certainly enhance impact. Technoserve and CLUSA did not depend on the project for any financial support and some areas they worked in are outside the project actions sites. Hence we classify 61% of these activities as complementary satellite activities.

In the 2012/2013 growing season, 378 demonstration plots (Table 15) were established in 14 districts in five provinces; Mogovolas, Rapale, Gurue, Sussundenga, Angonia, Tsangano, Macanga, Milange, Namaroi, Alto-Molocue, Malema, Gondola, Barue and Mossurize. Twenty-nine per cent (29%) of the farmers involved in establishing the demoplot were females.

**Table 15: Number of direct beneficiaries of N2Africa demo plots during the 2012/13 growing season, including satellite activities - Mozambique**

Sources	Provinces	Kind of event	# of the Farmers		
			Male	Female	Total
IITA	Nampula	Demonstration plot	10	21	31
IITA	Zambezia	Demonstration plot	64	25	89
IITA	Manica	Demonstration plot	5	8	13
IITA	Tete	Demonstration plot	71	29	100
IKURU	Nampula	Demonstration plot	0	8	8
TNS/CLUSA	Tete*	Demonstration plot	45	15	60
TNS	Zambezia <sup>†</sup>	Demonstration plot	51	7	58
TNS	Manica <sup>‡</sup>	Demonstration plot	12	0	12
TNS-North	Niassa <sup>‡</sup>	Demonstration plot	7	0	7
<b>Total</b>			<b>265</b>	<b>113</b>	<b>378</b>

\* Indicates 47% are satellite activities

<sup>†</sup> Indicates 64% are satellite activities

<sup>‡</sup> 100% satellite activities

### 9.2 Seed multiplication

During the 2012/13 growing season, IITA established 32 ha soyabean and 5 ha groundnut seed multiplication fields at Nkhome, Mutequelesse, Muriaze and Nametil. The seed multiplication fields were established to supply foundation seeds to partners including seed companies, farmers and farmers associations and also for project D&D activities and demonstration. IKURU also established



10 ha soyabean multiplication field in Gurue and about 117 ha of groundnuts fields in Mogovolas, Moma and Angoche districts in Nampula province.

In total 389 tons of soyabean seeds and 6.2 tons groundnuts seed were distributed by IITA and partners (Table 16). Out of this quantity, IITA sold 17.4 tons of soyabean foundation seed at reduced cost to seed companies and projects including Mozseed Ltd, Phoenix Seeds Ltd, Lozane Farms, CLUSA and Technoserve. Some quantities were supplied to other agencies and community-based organizations at no cost, for promotional activities. Our partners, Technoserve, CLUSA and IKURU provided seeds to farmers and farmers association as seed loan to be paid back after harvest in cash, discounted from the cost of their produce or pay back with seed or grain at an agreed interest. Part of the seeds distributed by our partners was seeds produced in the communities by out growers and farmers' associations last season and part was seed imported from Zimbabwe. Thus, community-based seed producers grow a significant proportion of the soyabean seed required for distribution.

**Table 16: Quantities of inputs distributed and number of farmers reached with inputs during the 2012/13 growing season, including those in satellite sites**

Sources	Provinces	Inputs Distributed				No. of Farmers		
		Seed <sup>†</sup> (kg)	Inoculant (kg)	SSP (kg)	Lime (kg)	Male	Female	Total
IITA	Nampula <sup>†</sup>	100	20	500	0	7	5	12
IITA	Zambezia	500	55	500	0	11	2	13
IITA	Manica	750	35		0	5	13	18
IITA	Tete	3,000	80	1000	0	221	200	421
IKURU	Nampula <sup>†</sup>	6,200		120	350	7	6	33
TNS	Manica/Zambezia <sup>*</sup>	68,200	1,160					11,182
CLUSA	Tete <sup>‡</sup>	310,025	440	3,500	-	5,150	3,464	8,614
<b>Total</b>		<b>388,775</b>	<b>1,790</b>	<b>5,620</b>	<b>350</b>	<b>5,408</b>	<b>3,703</b>	<b>20,293</b>

<sup>†</sup> This is groundnut seeds distributed in Nampula province

<sup>\*</sup> Indicates 64% of the farmers are considered satellite farmers

<sup>‡</sup> Indicates 30 % of the farmers are considered satellite farmers

### 9.3 Distribution of inoculants

Through partnership with Technoserve and Agri-Focus Lda, inoculants have been popularized in Mozambique. For example, in the 2012/13 season 1790 kg of inoculants were distributed (see table 16). Technoserve procured 1500 kg peat-based and 100 L liquid formulated inoculants and IITA procured 190 kg peat-based inoculants. The peat-based inoculants were sourced from various companies in different countries (BIAGRO – Argentina, Soygro – South Africa, BIOFIX – Kenya, Cell-Tech – Canada, Masterfix and Total Nitro – both from Brazil and HiStick for groundnut from Becker Underwood – SA). The liquid formulated inoculant refers to Cell-Tech (which is available in different formulations). See project report no 59 for test results on these inoculants. In addition, 5.6 tons of SSP and 350 kg of lime were distributed. In total, more than 20293 farmers received inputs of a kind.

### 9.4 Training and capacity building

In a joint effort N2Africa and partners IIAM, SDAE, ADEM and the Catholic Church organized over 53 training sessions in Nampula, Zambezia, Manica and Tete provinces. The training focused on crop management and record keeping. Table 17 provides details of the training events. Many training sessions were organized in the three districts in Tete province to complement the large-scale seed and inoculant distribution campaign undertaken by CLUSA, Technoserve and IITA. In total, 2,693 farmers were trained. Again, this includes the farmers in the satellite sites.



**Table 17: Number of direct beneficiaries of training activities during the 2012/13 growing season including beneficiaries from satellite sites**

Provinces	District / Villages	No. of Training	Female	Male	TOTAL
Nampula	Rapale / Muriaze	6	145	111	256
Nampula	Mogovola / Nametil	2	4	11	15
Zambezia	Gurue / Ruace	2	9	24	33
Manica	Chimoio	2	14	31	45
Manica	Sussundenga / Gondola	3	42	20	62
Tete	Angonia / Tsangano / Macanga	30	-	-	1,368
ADEM <sup>1</sup>	Angonia	2	-	-	97
SDAE <sup>2</sup>	Angonia	2	-	-	90
IIAM <sup>3</sup>	Angonia	2	-	-	89
Catholic Association	Angonia	2	-	-	84
IKURU*	Mogovola, Moma and Angoche	4	-	-	554
<b>Total</b>		<b>57</b>	<b>214</b>	<b>197</b>	<b>2,693</b>

\* IKURU trained 30 TOTs and the TOTs in turn trained 554 farmers.

<sup>1</sup>- ADEM =Associação para o Desenvolvimento Económico de Moçambique

<sup>2</sup>- SDAE = Serviços Distritais de Actividades Económicas

<sup>3</sup>- IIAM = Instituto de Investigação Agrária de Moçambique

## 9.5 Nutrition and home consumption of soyabean

In June 2011, N2Africa collaborated with Platform Mozambique and TLII projects, implemented by IITA, to conduct training in soyabean home processing and utilization in Zambesia province. Fifty-six (56) women were trained as trainers (TOTs) in soyabean processing techniques. These women were recruited from women groups from Lioma, Magige, Ruace and Tetete in Gurue district, from Molumbo in Milange district and from Namaroi in Namaroi district. The training aimed at improving the nutritional quality of commonly eaten foods with a focus on soya-fortified maize porridge, soya milk, rice-soya mixture, soya-vegetable soup, soya curry, sweet potato-soya baby food, soya flour for bread, cake, xima and cookies. In total 1498 females and 109 males participants were trained between July and November 2011.

Training and demonstrations of soyabean-based recipes were again conducted between April and June 2013 at Ruace and Lioma Health Centres in Gurue district. The target groups for these training sessions were children under 2 years, expecting and lactating women. These target groups were selected considering their elevated nutrient requirements. However, men were also invited to participate. Participation of men was encouraged to ensure support to women in purchasing the required ingredients. Furthermore, acceptability of the soyabean-based recipes by men would be crucial for home adoption. The overall aim was to improve the nutrient density of well-adapted food. Recipes demonstrated included soyabean flour, maize-soya flour thin porridge, maize-soya flour thick porridge, soyabean stew, soymilk, sweet potato-soya milk puree and pumpkin-soymilk puree. A total of 1392 women and 452 men participated in the training during this period. Twenty-four per cent of the participants were males indicating that the male participants increased compared with 6.8% in previous training.



## 10 Conclusions and recommendations

### 10.1 Summary and conclusions

As mentioned earlier the distinction between project D&D partners and satellite partners has become increasingly obscure as the project partnerships develop. Some satellite activities are well integrated within the project and the numbers of households reached are included in the tally of households reached directly by the project. For other satellite activities this is not the case and for some of these activities we do not have the counts, as these are not part of the reporting structure of the project. In table 18 the number of farmer households reached through delivery and dissemination activities in satellite sites are given. These are the numbers that are confirmed in this report that have not been reported earlier under the regular D&D activities of the project. It represents a partial count, as we do not have the data from all satellite D&D activities available. It refers to the dissemination of legume and BNF technologies and does not include beneficiaries of training or other activities. We conclude that the project has reached at least 31,299 farmer households through the satellite activities and in addition to the 252,347 farmer households reportedly reached through direct intervention of the project.

**Table 18: Number of farmers reached through satellite activities of the project in 2012 and 2013**

Country	Partner	Farmers reached
Kenya	MFAGRO	420
	Promasidor Outgrower Network	400
	One Acre Fund	200
Rwanda	CARITAS	1344
	COCOF	278
	DRD	2500
	Behar Bedasoa	70
	Medicus Mundi	125
	EPR	612
	CHDI	4210
	CHDI 2012	262
	One Acre Fund	100
Zimbabwe	LGDA	2300
	CTDO	400
DR Congo	Women for Women	2057
	SARCAF, PAD DIOBASS	1435
	DFID	980
Ghana	IFAD	6083
	ADVANCE	6363
Nigeria	SG 2000 MARKETS II	1500
<b>Total</b>		<b>31229</b>

An important distinction between Outreach Partners and Satellite Partners within N2Africa is that the former receive funds and inputs directly from the program while the latter build upon N2Africa strengths and momentum at no cost. Indeed, the target of 30 Satellite Partners and sites across the program is intrinsic to its larger and longer-term impacts and it is important for N2Africa to reach out to other organizations and agribusinesses with simple and reliable products that promote BNF. With this regard, there are two sorts of Satellite Partners, one that works directly with farmers and practices legume enterprise promoted by N2Africa, and another that advances broader project goals in terms of input supply, marketing and legume processing. In all countries there are Satellite Partners working with farmers (see Table 18) and those engaged with either farm input supply and legume processing, or nutrition. The Promasidor Outgrower Network in Kenya and IKURU in Mozambique are examples of an intermediate case where farmer groups are connected to soyabean production in the case of



Promasidor and groundnut in the case of IKURU, through input credit and guaranteed market. Indeed, in Kenya, like in other countries, the satellite partnership has extended well beyond legume producers, to include partners along the entire value chain in a manner that assures quality farm inputs and drives greater demand. We have reported on all these activities. In one country the presence of partners along the value chain may be more pronounced than in the other. In some cases our partners have adopted a clear value chain approach and they make their contacts and connections available to the project from which the project has benefitted tremendously.

The requirements for satellite partnership are not strict and are evolving. In quite a number of countries our development and outreach partners and co-operators have extended their numbers of participating farmers well beyond the targets set and supported by the program, opening new opportunities through revolving funds and marketing collection points for all members. Otherwise, we see partners joining the program at a later stage during the project that may receive inputs through the project but that do not depend on the project for operating funds. We see the roles of our co-operators change during the course of the project, putting more emphasis on bulking of grain and operating marketing collection points, as production increases and demand for such services is generated. Or indeed, establishing revolving funds that allow farmers to access inputs, or focussing more on (commercial) seed production, depending on the opportunities that arise. The co-operators are generally farmer-based organizations and this illustrates their importance. It is the farmer-based organisations that provide the intermediary structure through which smallholder agriculture can progress (access inputs and link to markets) and it is these organizations through which the interests of the smallholder farmer is being served. The degree to which farmers are organized, the institutional infrastructure and functioning of the farmer organization varies strongly between the various countries in the project though, and this determines to some extent the success of the project.

We do see that the project can have different modes of operations at the same time. That is, the project can be engaged in its own D&D campaign, while at the same time facilitating or supporting partners that conduct their own program using a different approach. It requires an open 'mind' and a project that is aware of the different roles it has to play to play and services it has to provide vis-à-vis the different type of partners (varying from technical backstopping, training, to dissemination and input supply for example). At the same time farmers engage in different ways with the project depending on their status and category the farmers belongs to (from starters or first time BNF technology testers to progressing farmers). It might very well be possible that farmers who grow soyabean, but have never worked directly with N2Africa, rely on the market collection points established by the project or its co-operators. In the end the distinction between Outreach Co-operators and Satellite Partners will disappear, certainly in practice at the end of the project. Therefore, it is more important how we empower and service Outreach Co-operators and Satellite Partners alike, rather than how we define them.

In summary, effective satellite partnership is critical to achieving the larger goals of N2Africa and is applicable across the entire grain legume value chain. Satellite partners and activities are of critical importance to increase the reach of the project and to the success of the project. The roles that satellite partners play are often complementary to the role of the project, but critical to increase adoption and enhance the impacts of the project. And partners (outreach co-operators and satellite partners alike) are critical in achieving sustainable impacts of the project.

## 10.2 Recommendations

Where contacts and 'collaboration' with satellite partners have been established, this has often been by chance and more as a result of the initiative taken by the satellite partner than as result of the action of the project. The project could have made more effective use of satellite partnerships, if we had been more active in seeking out potential satellite partners and earlier in the project. N2Africa can make better use of planning meetings, field days, radio broadcasts, and existing commodity or value



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chain platforms (and other) to expose the project and attract possible satellite partners to collaborate with. We should establish a clear strategy for communication with – potential - satellite partners.

We should adopt different dissemination models depending on the local conditions under which it operates. The project could collaborate with satellite partners along the entire value chain to do research on the different dissemination approaches and models for generating impact. This will involve targeted data gathering by satellite partners themselves, where applicable and when relevant. N2Africa should position itself better as a service provider with clear ideas of what these services entail and put structures and mechanisms in place that allows provision of those services in an efficient and timely manner.





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## List of project reports

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



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



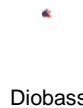
## Partners involved in the N2Africa project



Bayero University Kano (BUK)



Caritas Rwanda



Diobass



Eglise Presbyterienne Rwanda



Sasakawa Global; 2000



Université Catholique de Bukavu



University of Nairobi  
MIRCEN



University of Zimbabwe

