



N2Africa: Taking Stock and Moving Forward
Duduville, Nairobi 29-31 July 2015
Workshop Report

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N2Africa

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



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Short summary

The workshop was convened to take stock of issues related to project implementation in all countries and to develop action plans on how to move forward. The workshop was structured through: 1) One-on-one meetings with country coordinators and Fred, Ken and Edward, 2) Plenary sessions with discussions and 3) Group work to develop work plans. Outputs include an inventory of issues for each country, a list of decisions that were taken during the plenary discussions and work plans for activities on labour saving tools, nutrition and rhizobiology.

Keywords

Workshop, progress, reflection, learning loops, data flows, feedback



Aim of the workshop

Objective:

N2Africa is now 18 months into the second phase and it is time to take stock of what we have learned and how we can move forward.

Expected outputs:

- A set of issues and ideas from all country coordinators and other N2Africa staff in terms of:
 - Barriers and obstacles that need to be addressed
 - Key learning and highlights
- Ideas for direction change and adaptation of current activities
- Strategic ideas for over-arching syntheses across countries

Process to meet expected outputs:

Process: Few presentations, detailed discussions in plenary and small groups

Proposed Outputs:

- Summary of key barriers and obstacles that need to be addressed
- Allocation of tasks
- Key ideas for synthesis
- Prioritisation of topics and timelines to address them

Outputs from the workshop

- List of decisions made during the workshop
- List of issues per country
- Work plan labour saving tools
- Work plan nutrition
- Work plan Rhizobiology

Decisions made during the workshop

- Learning is key in N2Africa. We should document all choices we make and changes we make based on our learning loops.
- Rethink the impact analyses that we are going to do in Phase II based on lessons learned from early impact survey Phase I.
- Two options for data collection through partners:
 - N2Africa builds the capacity of partners to collect minimum agronomic data with the N2Africa framework. Partners should be selected based on capacity. The same goes for data collectors within specific partnerships
 - When partner's data collection systems are incompatible with the N2Africa system, either 1) N2Africa staff collects data or 2) partners provide the basis for N2Africa data needs ("Partnership Data template_End of year") or 3) the in-country data analyst, BDO or FLO can liaise with the partner to fill the "Partnership Data template_End of year" when the partner already collected data.
- All countries will do their basic statistical analysis (of agronomy and M&E data, to be done by the Data Analyst and the Country Coordinator) except DR Congo and Malawi where WUR will do the initial analyses and feed back to the country coordinators. All country coordinators should contact Joost when they have problems (e.g. capacity, time) analysing data and need assistance.
- The Data Analysts are responsible for all data in a country and uploading in the central database system.



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- After agreeing on what demonstration trials, diagnostic trials or adaptation trials during annual planning meetings in each country, protocols should be developed and shared with Project Coordination through Fred who will in turn share with the rest of the team for review.
 - Tier 1 coordinators are to identify specific country business development issues and indicate the available budget.
 - All country reports will be synthesised into one smaller report (20-30 pages) that contains the major information from all countries (report for the Foundation allows only 1-2 page).
 - The format for annual report should follow the milestones and allow narrative and breakdown of numbers reported. Definition, indicator and unit are inserted in the milestones table for reporting
 - The country reports need to be finished by November 30th.
 - Lessons learned and choices made should be captured in the annual report.



Key discussion points from Country Coordinators

Samuel Adjei-Nsiah – Ghana

1. Monitoring and Evaluating the various dissemination models being used by our partners and sharing the results with them
2. Carrying out market research on legume inputs (inoculant, fertilizers and certified seeds) to establish a business case for their import and distribution by agro-input dealers in Northern Ghana
3. Laying less emphasis on demonstrations and channelling part of the budget to support areas like input accessibility by farmers
4. Liaising with relevant national partners to release some of the promising legume crop varieties from IITA
5. Carrying out quality checks on Nodumax along the distribution channels
6. Early analyses of data from demonstration trials to provide input for subsequent demonstrations and making sure that research data from partners are made available to the project

Freddy Baijukya - Tanzania

1. Possibilities of involving expertise from CIAT/PABRA or other institutions, e.g. SUA to evaluate and developed consulted recommendation on managing soyabean pests and diseases. (This requires financial support outside the country budgets.
2. Need to have data from last season(s) analysed to allow for learning and decision making for following season's activities. Data management team need to support this, based on prior developed questions around the demos, adaptation and diagnostic trials.
3. Activity 5.6 (evaluation of the effectiveness and efficiency of various D&D approaches) require prior preparation. Support is needed in terms of designing methodologies and identification of personnel to do it e.g. students.
4. Need support in developing Business Plan for inoculants in Tanzania as well as the identification of consolidated demand. This is for the local agent of Legume fix to plan for import and distribution channels of Legumefix.
5. Any possibilities of purchasing and testing tools (planters and threshers) to save and increase labour efficiency – targeting women.

Jean-Marie Sanginga– DRC

1. Input supply
 - Inputs such as improved seeds, mineral fertilizer and inoculants still very limited in supply
 - Some farmers still having low production due to non-usage of mineral fertilizer but only manure
 - Limited quantification and commitment from farmer groups
2. Market issues
 - Market access becoming a major factor in adoption of technologies due to unsold produce
3. Rhizobiology Lab and Greenhouse under N2Africa, Bukavu
 - Limited supply of inoculants produced at Kalambo (could not supply 2000 sachets as demanded by the input supplier last season), no staff to run the lab (on consultancy currently where there are budget implications for the project) and high packaging cost
4. Linkage with other project or Initiatives e.g. IFAD project, Women-for-Women project
5. Nutritional aspect for processing soyabeans
6. Administrative charges: Many of the expenses are administrative expenses, e.g. transport staff, internet, CRES ADMIN CHGS, Bank charges, consultancy, mileage for vehicle use



Speciose Kantengwa - Rwanda

1. Areas where N2Africa Rwanda needs support: Rhizobiology(inoculants production especially for common Beans), Business Development, and Nutrition
2. Where N2Africa needs to be in 1 year and 2 years' time?
 - Reinforce the one stop shop centres initiated with 3 farmers' cooperatives, to make them learning centres for the community with N2Africa technologies
 - Reinforce the inoculants distribution system through the agro dealership network
 - The PICS manuscripts to be sent to Ken Giller for comments and advice; for eventual publication.
 - Support needed from the nutrition unit has to be well motivated. What we really need is about labour saving tools/technologies (e.g. planters and threshers), not to repeat what is already going on in terms on processing.

Peter Ebanyat - Uganda

1. Completion of the greenhouse at Makerere University
2. Exploring ways of expanding the groundnut value chain (groundnut Aflatoxin management)
3. Management of common bean diseases- higher level discussions to interest CIAT PABRA to participate in advise
4. Long-term experiments - citing and important questions guiding design
5. Feedback loops and data management- the role of DMO for quick analysis and Wageningen support in deeper scientific analysis, provision of clean data. There is need to ensure that critical questions are properly defined to guide experimentation and data analysis
6. Registration of Legumefix- find an agent
7. This was not discussed at the workshop but need agreement on Wageningen support to Uganda on nutrition

Emmanuel Sangodele - Nigeria

1. Publication from research partners and students' research work under our supervision; need clarification on condition for co-authorship of papers jointly written but outside ones specialisation
2. Target deliverables on livestock; nothing is done in Nigeria
3. Partners' inability to agree on some target milestones considered to be common to both parties: with specific reference to MARKETS II partnership.
4. Learning M & E should provide guidance on how to do things differently: e.g. strategy for value addition
5. Demonstration trial protocols for 2016 technology dissemination to reflect the leaning from 2014 experience.

Lloyd Phiphira - Malawi

1. Rhizobiology
 - a. Role of IITA in supporting AISL in Malawi: Free training for two technicians from AISL (Mw) in Nigeria
 - b. Samples of Nitrofix from Malawi to Dianda for analysis
2. Data collected from demonstration plots to be analysed-link with WU
3. Main focus for coming seasons-seed production and input and output marketing
4. Linking with stakeholders such as Clinton Development Initiative, AGRA and AfricaRising
5. There are no protocols for setting up demonstrations in Tier 1 countries
6. Dependency syndrome on the part of farmers-the majority do not take initiatives to be on their own e.g. spending money to buy improved legumes seed.



7. Nutritional activities: there is need to do a simple appraisal of the activities done under Phase I and plan accordingly based on the findings

Paul Woomer – Kenya

1. Increase resources to Thematic Leaders, in particular the Project Rhizobiologist and Tier 1 Rhizobiologist.
2. Rhizobiology is stagnating within the Project, and the Phase 1 N2Africa Rhizobium culture collection is largely abandoned.
3. Greater effort is required from the Business Development Officer.
4. There is little evidence of business development by N2Africa except for NoduMax. Ideas for business development by others seem to be ignored.
5. No support materials for BNF Technology Agribusiness Development are available.

Nkeki Kamai – Borno State

1. In implementing the project the issue of security is not a problem especially in the project area.
2. Market for cowpea, groundnut and soyabean is readily available in the project area.
3. This year NoduMax was introduced to the farmers and there was a high demand for it but unfortunately it was not registered and could not be made available to the farmers on commercial level.
4. Population trials (closer spacing) on cowpea, groundnut and soyabean are new this year due to our findings from last year.
5. Farmers now appreciate the application of fertilizers (single superphosphate (SSP)) on cowpea, groundnut and soyabean, on either improved or local varieties but the fertilizer is scarce in the project area.
6. This year we have enough staff on board to be able to successfully implement the work.
7. Engaging youths in agribusiness are a challenge but the Youth Agripreneur Facilitator is doing his best and he is on the right track.
8. Trained and dedicated Extension Agents and eager farmers with well-formed Community Based Organizations (CBOs) in the project area is a great opportunity.
9. As a challenge partners are insisting on getting laptops (3), cameras and email modems.
10. We have been equipped to succeed especially with the recent Gender workshop in Kano which was attended by senior officers from N2Africa management team including the Project Coordinator, who met and finalized a detailed work plan for N2Africa Borno especially on Gender and Youth agribusiness.
11. The two PhD students and three MSc students are at various stages of their studies.
12. We have a favourable working environment at IITA Kano station office.

Dianda Mahamadi – Nodumax

1. Need to get a summary of elite strains across countries including all Tier 1
2. Need to establish glass/screen house experiments in selected centres with proper equipment (Ethiopia, Ghana, Nigeria and Kenya). Screen batches 'elite' /repeated 30-50 with new entries each time. Select the few best strains from each batch.
3. Prospects for new species of interest?



Plenary discussions

Inventory of issues to cover

Ken, Fred and Edward had one-on-one meetings with all country coordinators. This led to an inventory of issues that we had to cover in the meeting (see above). For the meeting, it was decided that there should be a focus on **learning loops** and that there are **outstanding activities** (Rhizobiology, nutrition and labour saving tools) that need attention.

Areas that need focus to improve on feedback loops:

- Farmer resource endowment
- Farmer association type
- Market (inputs and output supply chain)
- Extension methods
- Dissemination methods (e.g. cooperatives vs Nucleus and outgrowers, lead farmers)

Review of tailoring approaches (Andy Farrow)

Andy submitted a paper for the special issue of Experimental Agriculture on 'Options by Context'. Almost everybody in the meeting is co-author. He discussed the set-up and contents of the paper in a presentation. The table describing the different ways of working (different packages, different dissemination methods etc.) needed updates from some countries. During the meeting, Andy had one-on-one meetings with country coordinators to update and complete the table.

Early Impact survey (Greta van den Brand)

Greta distributed the report from the early impact survey done in Phase I. She highlighted graphs in a powerpoint presentation and initiated a discussion on the results, methodology and usefulness for assessing impact.

One of the major difficulties in assessing the impact in N2Africa arises from the lack of counterfactuals because: 1) Baseline farmers were a random sample whereas farmers from the impact survey were farmers who participated in N2Africa; and 2) The questions in the impact that asked about farmers legume practices 'four years ago' (i.e. before N2Africa) appear to have been interpreted or answered in different and inconsistent ways.

Questions arising

Legume areas

- Why larger variation in area now than 4 years ago for some countries?
- Check distribution of area increase (per farmer)
- Questions on legume areas compared to farm areas (in different regions). (Was there bias in terms of farm size, does legume size make sense?)
- Is legume area increase related to resources endowment?

Inputs

- Zimbabwe bean no change in input use but large difference with baseline
- How can Ghana have 50% inoculant purchase when inoculants not registered or on the open market? May be SARI or IFDC sales?, There was importation and sales of inoculants from Benin
- Kenya highest inoculant use but lowest % purchased (but in Kenya only targeted farmers who received soyabean package)
- Explanations for high inoculant use in Mozambique could include use of vouchers



- Some comparisons not valid because crops confounded with area (inputs vs package reception)

What are lessons for future impact assessment?

Follow up on checking what useful data is there in the focal adaptation field books (compare with impact survey, analyse, draw lessons for designing impact survey).--> field history data
Look at methods to evaluate impact, counterfactuals may be impossible due to inherent sampling bias

Way forward:

- Greta continues working on the report, taking into account the discussions from the meeting.
- Rethink the impact analyses that we are going to do in Phase II based on lessons learned.

M&E & Data flows

M&E in partnerships

Problem: partners have their own M&E systems. How can we make sure they collect the data we need? And how can we make what they collect fit in our database?

Way forward: M&E 'taskforce' thinks about a solution during the meeting. See the section on this specific issue under 'group work' for the conclusions.

Feedback & Data flows

Early feedback to partners on key data summary is key for continuous data provision by partners. Feedback needed include the following:

- Summary of treatment effects per crop/region
- Technology Evaluation (both mid and end of seasons). Beneficiary preference and willingness to use technologies will be determined and integrate such feedback into subsequent activities
- Summaries of other results (milestones) achieved per each partnership; e.g. numbers of demos/adaptation/field days/trainings, actors reached, gender issues resolved, etc. draw conclusions of such data and also link some achieved outputs to their outcomes where possible.
- Farmers' preferences should also be part of the feedback system. This can be captured through technology evaluation and field days. In addition, we can document what packages farmers choose (i.e.: which packages are popular).
- Planning meetings must serve as one major platform to integrate feedback into actions. Relevant participants (beneficiaries and partners) must be present
- Partner specific planning meetings have proven to be more effective than the general planning meetings with all partners. The general meeting then brings the overall view and actions together.
- Both methods (partner specific and general planning meetings) are important and need to be organised and coordinated at country levels
- Because N2Africa focuses on learning, we should document all choices that we make based on the feedback loops.

Data analyses

- Basic analyses of all data (agronomic and other M&E data) should be done at the country level to provide needed feedback before the start of another season. Such data MUST be the same as that uploaded onto the system, seen and corrected. Such basic analysis should be based on questions needed to be answered before start of the season
- The analyses must be useful to partners and beneficiaries including their feedback
- All countries will do their basic analysis (by the Data Analyst and the Country Coordinator) except DR Congo and Malawi where Joost will have to make simple such basic analysis for them. Greta and Esther can also assist where possible. All country coordinators should contact Joost when they have problems (e.g. capacity, time) analysing data and need assistance.



- The Data Analysts are responsible for all data in a country and for its upload onto the system. The BDOs are responsible for analysing the data about partnerships.
- An overview of what data are collected for what reasons/milestones could be useful.

Protocols

- Protocols are to be developed after planning meetings with partners at country level, content must focus on what has been agreed to be demonstrated or researched into (diagnostics). The draft protocol must be sent to the project team for inputs before finalization
- After agreeing on what demonstration trials, diagnostic trials or adaptation trials during annual planning meetings in each country, protocols should be developed and shared with Project Coordination through Fred who will in turn share with the rest of the team for review.
- A standard template for protocols is needed to guide the content (by Joost)
- The finalised protocols from all countries can be viewed on the intranet

Scope for learning M&E, case studies with N2Africa funds within partnerships

- Apart from the usual data collected on annual and seasonal basis, other surveys will be conducted to provide in-depth feedback on specific outcomes and learnings generated by the project and its partners. Some surveys will be done in all countries and others specific to countries.
- N2Africa will support specific learning studies (in-depth) for selected outcome milestones together with partners to provide further learning for the partnerships
- **Scope for core team of enumerators (to cover learning M&E such as technology evaluation and other learning surveys).** The group can be used to determine the spill over effects (surveying both participating and non-participating beneficiaries)
- Budget to support learning and core enumerators (if applied) will be from M&E budget at the country level. Need to define coordination/reporting structure.

How can the Business Development Officer assist Tier 1 Country Coordinators?

- DRC: on input supply strategy-may have to identify agro-dealers and assist them expand their business-applies to many countries (proposal to conduct value chain analysis)
- Mozambique: has been discussing with Edward and has received a lot of support and ideas
- Zimbabwe & Malawi: agro-dealership is well established so will discuss with Edward on other opportunities e.g. explore how IITA-CARD/ICCO partnership on soya profitability project and scalability in Malawi.
- Kenya: has own business model for BNF technologies, labour saving technologies

Tier 1 coordinators are to identify specific country business development issues and indicate available budget.

The use of ICT Platform

- The Sentinel Grants has been approved by the Gate Foundation with additional budget to support the development and management of ICT platform for N2Africa M&E system through ALINe
- Theresa and Joost made a proposal, this has been approved.
- The support will cover:
 - 55 Tablets; to be shared across core countries and tier 1 countries (average of 2 tablets per tier 1 and 9 tablets for core countries + initial 5 tablets for core countries)
 - Use of aWhere platform to provide data summaries and reporting
 - Dashboards to provide quick overview of project results
 - Programming of M&E tools for use on tablets

Issues/questions on our ALINe supported M&E

- We are now 18 months into the project and therefore need to employ everything NOW (note: the ICT platform should be operational by the 4th quarter of 2015 per the results framework and needs to be adhered to)



- How does AWhere add value to what we already have? → linked to the database and it can instantly produce simple graphs on intranet
- Can AWhere be on our website (external)? → Explore the technical options. Do we want everybody to have access to our raw data? → We have a contractual obligation to provide this. aWhere could be a great option to show on our website where we are!
- Everybody can turn surveys into digital form, the programming is technically easy and aWhere is open to everybody.

Annual reporting (led by Greta)

What do we want with our annual reports?

- Country reports: distribute within countries (e.g. to partners)
- Combine country reports and exchange among countries (for staff)
- Synthesise country reports into one smaller report (20-30 pages) that contains the major information from all countries. Suggestion: the narrative could go in a podcaster (and there could be a link to the reporting on milestones)

Format

- Format should allow narrative and breakdown of numbers reported
- Format by milestones is desired
- Suggestion from Theresa and Greta: put (analyses) tables and/or graphs in the narrative, so the narrative directly links to the numbers and we get the bigger picture around the reported numbers. But make sure the numbers reported in the narrative always correspond to the numbers reported in the milestones table!

Definitions

- Not everybody used the same definitions when reporting
- Agreement: Definition, indicator and unit are inserted in the milestones table for reporting

Flow of reports

- Reports went directly to WUR, but also had to go through IITA administration. Need to streamline but also need to ensure the procedures of partners are adhered to.
- The country reports need to be finished by November 30th, before everybody goes on leave

'Empty milestones'

- Sometimes nothing is reported, but it is clear that activities are going on. Report everything!

Lessons learned

- Learning and feedback loops were an important part of the whole meeting. The section about lessons learned in the annual report provides the opportunity to describe the learning, how you deal with that learning, and what you change in your next work plan.

Way forward: Theresa and Greta will work on a new reporting format. The major outline will remain the same, such that it corresponds with the structure of the monthly updates. Changes will include better awareness of definitions and connecting narratives with reported numbers.

Variety selection tool (Andy Farrow)

SG2000 asked - What is the most appropriate legume species/variety within the southern guinea savanna to the sudan savanna? Also, within two sister projects on maize and cassava agronomy,



partners are very much interested in a 'variety selection' tool that proposes a (set of) varieties that are adapted to a specific location (and other traits).

Andy started the discussion with the following questions:

- Would such a tool make sense?
- Is anyone else providing such a tool?
- What are the potential methods and data requirements?

The tool could work in various ways:

- Data Driven- Environmental Niche models
- Process driven – crop growth simulation models

There was a general consensus that a variety selection tool would be useful. Often partners ask which variety is suitable for which area. There is a lot of knowledge, and many trials have been done, but the information has not been formalized. There is a lot of data available from Phase I variety trials and from the Tropical Legumes project.

But:

- Will such a tool provide better information than a local agronomist? (yes, it can take it 'one step further')
- Will people be aware of the margin of error of such a tool?
- There are many factors influencing the choice for a variety, e.g. market preference and taste (could be a 'filtering tool' on top)
- Actual practices such as sowing date could override the results of the tool
- When the model is there, it needs to be updated regularly.

Public Private Partnerships (Tamiru)

Tamiru gave a presentation with an example of a PPP: Soyabean grain for Chewaya Cluster in Ethiopia. This example had 15.000 farmers projected. Currently, around 2000 farmers are involved in this particular partnership. The farmers are organised in cooperatives or unions. In a PPP all partners are linked to each other and interact with each other – everything is fixed in a contract.

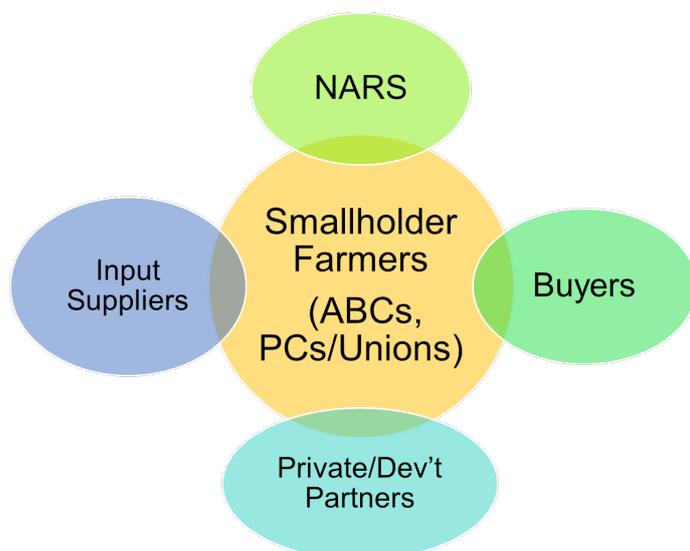


Figure 1. Example of organisation of a PPP (Soyabean grain Chewaya Cluster).



Discussion: M&E in such a partnership

- How to organize structure sampling? → following the focal adaptation trials sampling framework
- There are various roles and responsibilities in big partnerships. Partners are responsible to provide specific information (not everything!)
- Need to keep track on/register groups participating in demonstrations

Discussion: Issues in partnerships (various countries)

- Although partners are initially motivated to join in a PPP (partners want N2Africa technologies and sign contracts) but there can be issues later, for example if partners are not up to the task
- There can also be issues during the PPP development stage
- Discipline: unions have their coherence and structures
- Partnerships around specific commodities could be restricted because farmers have livelihoods around several crops.
- The example from Ethiopia has five chain actors on both input and output supply. But this does not happen in all countries (yet). The input and buyer actors are the ones usually missing.

There are different models for partnerships for different countries or even different areas within a country!

Exit strategy and PPPs

- PPPs give a temporary boost in inputs and knowledge, which both favour adoption
- The exit strategy goes via increased skills and knowledge

Other issues

- Ken advised Country Coordinators to read the article he recently posted on Podcast on some bogus/predatory journals and how to avoid them
- Podcaster contributions: Country Coordinators or their respective partners were encouraged to write articles for the Podcaster
- PhD/MSc Students: Country Coordinators who are hosting students were advised to have a closer eye on them and ensure that they finish their studies as the N2A project closes
- Communication master plan is still work in progress.
- Internal communication is still a bit of a challenge. Individual follow up is important to encourage feedback. There is also need to know who needs to be copied in your email
- **Monthly reports** – Theresa to look at the current monthly template *vis a vis* the annual report template, and then see how to improve the monthly report. Which will be instrumental in compiling the annual report. Everybody was advised to submit every month and on time.



Group work - Work plans for outstanding activities & issues

Major issues to discuss:

- Group 1: Labour saving tools (Edward Baars)
- Group 2: Nutrition (Regis Chikowo)
- Group 3: Rhizobiology work (Mahamadi Dianda)
- Group 4: Data flows (Joost and Theresa)

Group 1: Labour saving tools

Speciose Kantengwa, Edward Baars, etc.

Plenary discussion prior to group work

What activities are there now? What opportunities?

Nigeria

- Maximise population / area (cowpea, soyabean, groundnut)
- Technologies include hand drawn seed planter and Ox-drawn.
- Testing with women groups (20 groups) and testing with men as well.
- Borno will promote the validated ones

Tanzania

- Inventory of labour intensive activities for women in value chain. Planting and weeding targeting at group and household level.
- Threshers for groundnut (tested). There are no traders on how to procure
- Service centre

Uganda

- Identification is on-going
- Weeding (herbicides for weed control)
- Threshers (groundnut, beans)

Ghana

- Mechanical dibbler (SA) – Soyabean
- Threshers – Soyabean

The group presented activities that can be part of the work plan and discussed this in plenary:

- To succeed in this work focus on herbicides as first target against other options
- There was discussion as to the utility of planters with some experience suggesting that planters are never widely adopted despite years of testing. Next to planters, threshers may be a more viable option
- Planters may not be a priority in all countries, say in Malawi it is not a priority to demonstrate planters
- Machines for groundnut threshing/ removing groundnut from the plants are being demonstrated in Malawi
- In Ghana planters could not work but threshers are viable whereby the owner of the threshing machine takes one bag after threshing ten in return. Also it was observed that farmers are already using herbicides. It is easier to work with herbicides than with threshers and planters
- It was observed by the M&E Specialist that the issue of the labour saving validation is a very important milestone whereby each country must validate at the end of the year. It is a key result that needs to be delivered
- This aspect of the results framework need to be achieved even by Tier 1 countries even/though with limited budget



The group developed a work plan with questions, a timeline, activities and responsibilities. During the meeting, the group made an inventory of potential labour saving tools per country (Table 2).

Labour saving tools – what do we want to know?

Before including labour saving tools in dissemination strategy

- Options for labour saving tools per country
- Feasibility of options to contribute to labour saving / which tools are the most promising
- What are the constraints to the most promising tools / why are farmers not using the tool
- How can we use the constraints to develop the right dissemination pathway
- How many (women) farmers are using labour saving tools (info can come from focal adaptation surveys in core countries? Where from in Tier 1 countries?)

During dissemination

- How do farmers evaluate the labour saving tool(s)
- How do the labour saving tools perform

After dissemination

- How many (women) farmers are using the labour saving tool(s)

Table 1. Work plan for activities around labour saving tools

	Tasks	When	Who
1	Complete guidelines	Sept 2015	SBDO/GENDER TEAM
2	Decide on Coordination structure	Now	SBDO/GENDER TEAM
3	Budgeting and human resource selection – ToR design	Sept 2015	SBDO/GENDER TEAM
4	Inventory – Basket of options, actual and under development	Sept-Oct-2015	SBDO/GENDER TEAM
4.1	Labour saving options relevant for the country and concrete activity plans for 2015-2016	July 31, 2015	Coordinators
5	Blue print feasibility analysis and hypotheses generation	Sept-Oct-2015	SBDO
6	Survey design – existing – promising models at organizational, financial, delivery, quality control levels – Concept Note	Sept-Oct-2015	SBDO/GENDER TEAM
7	Set-up Demos-Pilots – validations and conduct evaluation-demand surveys– Farmer Field Schools and Supply Chain Actors / synergize with Partner	Oct 2015-April-2016	Coordinators / BDOs
	<ul style="list-style-type: none"> • Define pathways for dissemination depending on level of knowledge and awareness 		Coordinators / BDOs
	<ul style="list-style-type: none"> • Generate solutions, interventions and related activities to alleviate adoption constraints 		Coordinators / BDOs
	<ul style="list-style-type: none"> • Make the full business case and facilitate delivery 		Coordinators / BDOs
8	Data and information collection	Oct 2015-April-2016	Coordinators / BDOs
9	Data flow, collection, analysis, reporting and sharing	Oct 2015-April-2016	SBDO/GENDER TEAM
10	Evaluation and next season planning	May 2016	SBDO/GENDER TEAM



Table 2. Inventory of labour savings tools per country made during the workshop.

Country	Tool	Used already?	Validation part of workplan?	If not to be part of the next workplan	Comments
Borno	Planters	No	No	Yes	
Borno	Threshers	Yes	Yes		Needs improvement
Borno	Groundnut oil extractors	Yes	Yes		Not sustainable
Borno	Herbicides	Yes	Yes		
DRC	Herbicides	No	No	Yes	
DRC	Sickle	No	No	No	
DRC	Thresher for soya bean	No	No	Yes	
DRC	Hand planters	No	No	Yes	
Ethiopia	Wet soyabean grinder	introduced but not widely used	Yes		
Ghana	Threshers	No	Yes		
Ghana	Herbicides	Yes	No	Yes	
Ghana	Planters	No	Yes		
Kenya	Weed wick	No	No	No	
Kenya	45 cm furrow maker	No	No	No	
Kenya	Diamond shaped hoe	No	No	No	
Kenya	Dual gold granular pre-planting herbicide	In between	No	No	
Malawi	Pre-and post emergent herbicides	No	No	Yes	
Malawi	Groundnut stripper	No	No	Yes	
Malawi	Groundnut sheller	No	No	Yes	
Mozambique	Herbicide for land preparation	In between ^a	No	No	
Mozambique	Threshers for soya bean	No	No	No	
Nigeria	Hand planters	No	Yes		
Nigeria	Threshers	Yes	Yes		
Rwanda	Herbicides	No	No	Yes	
Rwanda	Sickle	No	No	Yes	
Rwanda	Thresher for soya bean	No	No	Yes	
Rwanda	Hand planters	No	No	Yes	
Tanzania ^b	Groundnut thresher	No	No	Yes	
Tanzania	Soyabean planter	No	No	Yes	
Uganda	Planters ^c	No	No	No	
Uganda	Herbicides	In between	Yes		Priority
Uganda	Threshers for soya bean and beans	No	Yes		
Uganda	Sorters/Grader tool	No	Yes		
Uganda	Processing for peanut butter	Yes	No	No	Looking at different niche markets
Zimbabwe	Thresher (for soya bean)	No	No	Yes	
Zimbabwe	Herbicides	In between	Yes		Used but not widely

^a None or less available for land preparation

^b Inventory of available tools for different legume ongoing, will be provided once the survey is completed.

^c Not adjusted for grain legumes



Group 2: Nutrition

Peter, Regis, Joost, Freddy, Tamiru, Samuel, Lloyd, Fred, Ken, (Bussie, Ilse et al. not present but to be consulted).

Plenary discussion prior to group work

- Demand for food – beans (high)
- Diversify products with cowpea (Southern Africa)
- Prioritize
 - household consumption
 - other markets (products address nutrient deficiencies)
 - What are the nutritive values of varieties of legume species

What is the production objective? Marketing or household consumption? N2Africa to provide knowledge and the opportunity for the farmers to make the decision.

Work plan

Introduction

Grain legumes are an important source of protein within the sub-Saharan African diet (and a significant part of the diet, on average 11% of energy intake is from grain legumes and only 3% from animal products (Schonfeld & Hall, 2012). Besides a lack of dietary protein, lack of micronutrient intake is (even more prevalent) resulting in malnourishment especially among infants and young children and women of reproductive age.

Beyond protein, the real value of grain legumes seems to come from supply of mineral nutrients and vitamins, which may alleviate human nutritional deficiencies and improve immunity to diseases (de Jager, 2013, other evidence?). Legume grain contains mainly B vitamins. Leaves of cowpea and common bean contain also vitamin C and pro-vitamin A. The nutritional benefits depend on bioavailability of nutrients (preparation methods, other ingredients in same dish) and the amounts of anti-nutritional factors in the grain.

Problem statement:

There is widespread deficiency of some essential minerals in foods consumed by rural households. Accumulation of these mineral nutrients is related to the environments in which the crops are grown, the genotype and management (G x E x M). To date, there is paucity in understanding of these interactions! And will the potential increase in bioavailable nutrients be sufficient to be relevant for human nutrient requirements?

Background

G x E x M

De Jager (2013) indicated that in wheat and rice 'increased Zn concentrations in solution and plant Zn uptake can [...] be related to increased plant biomass production, but not necessarily to increased Zn contents in the edible parts'. Jiang et al. (2008) showed that there is too little scope from a human nutrition perspective to enhance Zn mass concentration in the rice grain by simply increasing the Zn supply to crops, because Zn allocation to the rice grain is limited. Similar observations were made by Stomph et al. (2011) for wheat. Therefore a distinction is needed between the crop production and the related human nutrition when evaluating options to increase the Zn status of crops. Options to increase human Zn intake via biofortification and food fortification of rice or the use of supplements have been comprehensively reviewed by Duffner et al. (2014a).

Relevance for human nutrient requirements

De Jager (2013) calculated amounts of legumes that should be consumed to meet one's daily required intake of iron. Cowpea contains 7.3 to 8.3 mg iron/100 gram edible portion (Food Composition Tables: USDA and West African table). A 15-17 years old girl requires 62 mg iron per day (assuming a low bioavailability of iron in her diet). This means she needs to eat 850 to 750 gram (depending on



GxMxE) of common bean per day to fulfil her iron requirements. However, 750 gram provides 2625 kcal (350 kcal/100 g). As an average adult woman requires 2000 kcal per day, therefore 750 gram of common beans is not feasible. Of course other foods in her diet will also potentially provide iron but it shows that the increase in iron is not sufficient to really increase iron intake. Or it still needs to be combined with other methods like enhancing bioavailability by eating vitamin C together with common beans or fermentation of beans to decrease phytate level or new breeds (high iron bean, Harvestplus).

Objective The team seeks to investigate sensitivity of nutritional components of different grain legume crops (and varieties) to environments in which they are grown and the associated management across countries.

The research questions include

1. Under what conditions and management do we make the most nutrition/nutritive gains for different grain legume crops?
2. Which are the most sensitive nutrients and anti-nutritional factors that respond to management for the different crops? (Do we find different nutrient and anti-nutritional factors accumulation patterns among different legumes, as function of management and environment (interactions)?)
3. Are the potential different nutrient and anti-nutrient accumulation patterns meaningful for human nutrition? (Or are for example preparation methods, storage methods and combination of foods consumed (recipes) more relevant for increasing nutrient bioavailability?)
4. In integrated crop-livestock systems prevalent in Africa, what impact would the associated residues have? (Is it beef or milk productivity?)

Note: These studies will focus on characterization of nutrients and antinutritional factors (Zn, Fe, protein, fat, ash, amino acids, trypsin inhibitors, phytates) accumulation in both grains and leaves as a proxy for human nutrition outcomes.

Methodology

Table 3. Country (sites), grain legumes selected, treatments, agro-ecologies and source of grain legume samples

Country	Crop	Varieties	Management/ treatments	P fertilizer type	Agro- ecologies	Type experiment	of
Ghana	Soyabean	1 (36)	control	TSP	3	Diagnostics	
			+P +I				
			+P+I+K+Mg+Zn+Fe				
	Cowpea (dual purpose)	1 (36)	control				
			+P				
			+P+K+Mg				
Tanzania	Common bean	2 (48)	control	TSP	2	Demonstrations	
			+P				
			+N+P				
	Soyabean	2 (72)	control		3		
			+P				
			+N+P +I				
Ethiopia	Soyabean	3 (108)	control	DAP	3	Demonstrations	
			+P				
			+N+P				
	Common bean	3 (108)	control				
			+P				
			+N+P				



	Chickpea	3 (108)	control +P +N+P			
Zimbabwe	Soyabean	2 (72)	control	SSP	3	Demonstrations
			+P			
			+P+I			
	Common bean	3 (72)	control		2	Diagnostics
+P						
+P+N						
Uganda	soyabean	3 (72)	control	TSP	2	Demonstrations and diagnostics
			+P			
			+P+manure			
	Common bean	3 (72)	control		2	
			+P			
			+P+N			
Groundnut	(24) Assumed 1 variety	control	3			
		+P +manure				
		+P + gypsum				
Nigeria	soyabean	2 (72)	control	SSP	3	Demonstrations and diagnostics
			+P			
			+P+I			
	Groundnut	1 (36)	control		3	
+P						
+P+manure						
Rwanda	Soyabean	3 (144)	control	DAP	3	Demonstrations
			+manure			
			+P+ manure			
			+P+I +manure			
	Climbing beans	3 (72)	manure		2	
+P+ manure						
+P+I+ manure						
DRC	Soyabean	3 (108)	control	TSP	3	Demonstrations
			+P			
			+P+I			
	Common bean	2 (72)	control			
			+P manure			

Notes:

- Number in parenthesis is the number of samples to be analyzed for the different parameters.
- Treatment descriptions table to include actual nutrients applied and other agronomic practices
- Agro-ecological description and sites characterization – tabular (rainfall, soil type, soil fertility indicators,

Sample collection

- Grain samples to be collected for a minimum of 4 reps (4 farms) per agro-ecology for ONE or TWO seasons (does this kind of study require 2 seasons data???)
- Vegetative samples to be taken at peak flowering (is it the best time, and what plant parts – young leaves?? Follow what farmers do locally – in cowpea, climbing beans) for crops whose



leaves are used as leafy vegetables/relish?? Young leaves and young pods for beans? Research in Ethiopia (see attachment in email) shows different methodologies used for methods for determination of protein digestibility and anti-nutritional factors in haricot beans.

- Sampling to be done by N2Africa project Field Liaison Officers (FLOs) (where they exist) with guidance from country coordinators where or by experienced technicians. Partners that do not have research inclination.

Sample collection and handling

Protocol for sampling for mineral analysis

- 1) Select unbroken, clean and healthy pods (fully brown).
- 2) Wash the selected pods with the de-ionised water (avoid longer stay of the pods in the water) and air-dry
- 3) Remove the seeds from the pods and pile the seeds evenly on a clean surface (stainless tray or plastic recipient is recommended)
- 4) Flatten the pile and spread into circle
- 5) Divide the circle into quarter. Take adjacent sections and mix.
- 6) Wash the seeds with the de-ionised water for few seconds (do not allow seeds to stay long in the water, to avoid peeling of the outer coat)
- 7) Put the seeds into a plastic recipient and dry overnight at 60°C in a stainless conventional oven.
- 8) Pack the samples into a labelled mineral –free white sample envelope ready for milling
- 9) Mill fine (0.5mm sieve size) using stainless analytical miller.

Precautions

- 1) Gloves (powder-free) are to be worn throughout the handling of the samples.
- 2) The samples are to be covered by soft tissue paper while drying to avoid contact with the dust.

Analyses

Centralized (Utilization Lab, IITA-Ibadan)

- Mineral nutrients
- Protein – amino acids
- Anti-nutritional factors
- Soil samples (routine analyses +micronutrients of interest to this study Zn, Fe)

Important nutrients in legumes for human nutrition (relatively high in comparison with maize):

- Amino acids (essential), protein digestibility
- Iron
- Zinc
- B vitamins (Thiamine, Riboflavin, Niacin, Vitamin B6, Folate, Vitamin B12)
- for leaves also pro-vitamin A and vitamin C (if not cooked at length before consumption)

Important anti-nutritional factors (bioavailability of above nutrients for humans (and animals) :

- Phytate - zinc, iron absorption, protein digestibility
(The amount of phytate in grain legumes is highly variable as it depends on a lot of factors: growing conditions (phytate level seem to increase with higher temperatures and when phosphate-rich fertilizers are used compared with natural compost), harvesting techniques and processing methods.)
- Trypsin inhibitors – inhibit action of trypsin, protein digestibility
- Tannins – protein quality and iron absorption



• **Table.4: Phytate and tannin content of grain legumes (mg/g on dry matter basis)**

Food	Phytate (mg/g)	Tannin (g/kg)
Common bean	-	0.3 – 7.5
Cowpea	3.9–13.2 (cooked)	1.4 – 10.2
Groundnuts	9.2–19.7	-
Soyabean	9.2–16.7	-
Chickpea	2.9–11.7 (cooked)	0.8 – 2.7
Pigeonpea	-	3.8 – 17.1
Maize	9.8 – 21.3	-

Note. Phytate data adapted from 'Phytase for food application' by Greiner & Konietzny, 2006 (Greiner & Konietzny, 2006) & Tannin data adapted from 'Effects of anti-nutritional factors on protein digestibility and amino acid availability in foods' by Gilani, 2005 (Gilani et al., 2005).

- Samples available this season
 - Uganda- groundnuts, common bean, soyabean
 - Zimbabwe –common bean
 - Ethiopia – soyabean, chickpea, common bean
 - DR Congo – soyabean and common bean
 - Rwanda – soyabean, climbing bean

Other data to collect

- Rainfall
- Soils data at field level

Animal feed

- Quality of crop residues for livestock feed (crude protein, fibre, minerals)??

What support?

- Product development through local expertise
- Advice on nutritional analyses (IITA-Ibadan)
- Protocol for sampling, handling and grinding (or we send raw grains) and lab analyses (Fred to coordinate with advice from Bussie/Ronke)
- Inventory of products of human nutrition available.

Immediate action point

Before large samples can be sent, we use common bean samples from a Zimbabwe N2Africa graduate student to pilot the study. Results will inform/refine the next steps. Samples to be sent to Ibadan within the next 4 weeks

Publication timeline

Please already think about the target journal ---submission date: July 31, 2016

References

- Admassu Shimelis, E., and Kumar Rakshit, S. (2005). Antinutritional factors and in-vitro protein digestibility of improved haricot bean (*Phaseolus vulgaris* L.) varieties grown in Ethiopia. *International Journal of Food Sciences and Nutrition* 56, 377-387. doi: 10.1080/09637480500512930.
- de Jager, I. (2013). *Nutritional benefits of legume consumption at household level in rural areas of sub-Saharan Africa. N2Africa Report*. Wageningen: Wageningen University.



Group 3: Rhizobiology

Group 3a: Dianda, Ken, Emmanuel, etc

The group started a work plan including a timeline, activities and responsibilities. The provisional work plan is given below, but it is still under development.

Background – The second phase of the N2Africa project is assumed to build on lessons learnt from experience and achievements gathered during the former phase, which is yet to be implemented for some topics. In Rhizobiology for instance, the Master Plan suggests that massive work has already been done toward creating an active and dynamic rhizobium database, especially in terms of rhizobium isolation for the target legumes, curing of such collection till identification of candidate elite strains for the respective hosts. Reviewing such data is part of tasks that are overdue since the launching of the current phase. This work plan is meant to provide guidance to partners on their involvement to push rhizobiology work forward (Table 5).

Task 4.5.1 Review of Phase I Rhizobiology data and secondary literature (Year 1)

This task will synthesize the current state of knowledge on the rhizobial strains for each of the key N2Africa legumes. It will bring together experimental data from Phase I, the bridging grant, and published data from the literature. This is urgently needed and sounds rather more concrete than update on identification of candidate elite strains” - as we discussed in the workshop we need not only the plan of what we are going to do, but also the JUSTIFICATION of why we are doing it - i.e. as you indicated in our discussions what makes a “candidate elite strain” as we have termed it - and what makes an “elite strain”.

Discussion and comments

- Freddy – what activities exactly should they be doing under rhizobiology?
- Dianda - One has to have the capacity at the country level. Country Coordinators to follow up the quality of inoculants being distributed and ensure they implement it.
- Please also look at the Rhizobiology Master Plan and check the other milestones that need attention.



Table 5. Summary of work schedule for Rhizobiology

What? (Task)	Who? (leader)	Who? (Participants)	When (time)
1. Update on identification of candidate elite strains for the target legumes (Soyabean, Cowpea, Groundnut, Chickpea, Beans, etc.) (refer to phase I database + Ethiopia, and Rhizobiology Master Plan) - Summary of student work: MSc, PhD and others - Summary of candidate elite strains - Make sure candidate elite strains (per crop) at country level are collected for sending to central labs (Ibadan, Woomer in Kenya)	IITA/Ibadan Mahamadi Dianda	All country coordinators	By end August 2015
2. Collection of potential elite strains for sharing	IITA/Ibadan Mahamadi Dianda MIRCEN /Nairobi Nancy Karanja	All countries coordinators	By end November 2015
3. Evaluation of the new collection for advancing towards inoculants production	IITA/Ibadan Mahamadi Dianda	Ghana, Nigeria, Ethiopia, Tanzania and Kenya	January 2016
4. Other Tasks <ul style="list-style-type: none"> Set up of quality control mechanisms and follow up on quality information form quality assurance labs and or Regulatory authorities in countries where inoculants are commercialized. What about collection of data on quantities of inoculants used in different countries to feedback into our M&E framework Quality control (add details on how this will be done) 	For advice: Ethiopia (Endalkachew)	Uganda, Tanzania	November 2015
	To be built into M&E for all countries - Theresa	Tier 1 countries	November 2015



Group 3b: Tier 1 Rhizobiology Workplan (Paul Woomeer)

RHIZO BIOLOGY SUPPORT FOR TIER 1 COUNTRIES

1. Malawi – Lloyd Phiphira

- Paul Woomeer requested to visit Agricultural Inputs Supply Limited (AISL) either in October and November when inoculant production is in progress to guide them on general production and management of inoculant
- IITA to support training of two technicians from Agri-Input Suppliers Limited (AISL) on quality control. AISL will take care of their travel and accommodation while at IITA.

2. Rwanda – Speciose Kantengwa

- Under Phase I, MSc student identified beans and soyabean strains. 10 strains were identified and kept at Rubona lab at RAB. There is a need to test them on farm in order to select the best one which can be used for inoculants production.
- Find out if any of these strains were shared with MIRCEN
- Need to share/exchange these strains with Nancy and Dianda for conduct standard evaluation with strains from other countries
- Given RAB is already producing inoculants, they need support on how conduct quality assurance
- RAB lab need a new batch of strain used in inoculants production

3. DR Congo – Jean-Marie Sanginga

- Advise on how to increase inoculum production at Kalambo Rhizobiology Lab
- How to better link with Nodumax-IITA and MIRCEN-UoN
- Assistance in proposal development to source for additional funds for Rhizobiology work at Kalambo
- Assist in article publication of available Rhizobiology data in a peer-review journal

4. Mozambique – Wilson Leonardo

- Lab equipment to conduct Quality Control (QC) have been installed at IIAM, Nampula facilities.
- Activities in Mozambique will focus on quality control given that the country has no capacity to locally produce inoculants and not likely to happen soon.
- Technician trained during Phase I capable of conducting QC.
- Wilson will alert if further assistance is required in with respect to QC or any other issue
- Wilson will discuss with IIAM DG, on how the quality control activities will be carried out in Mozambique.
- No visit of Paul is required

5. Zimbabwe – Regis Chikowo

- No Rhizobiology support is needed
- No visit of Paul is required



Group 4: Challenges and Proposed solutions regarding integration of M&E into Partnerships

1. Partner's willingness/ability to collect N2Africa data

Some partners are willing to collect needed data required for N2Africa as part of the partnerships. However, capacity of the partner field staff in some situations are limited.

N2Africa to build the capacity of partners to collect data (Where partners are willing to collect N2Africa data)

- N2Africa has been requested in partnerships (especially in core countries) to design protocols in all partnerships. The protocols **MUST HAVE** field books annexed, followed by training from data analyst and/or Field Liaison Officers (FLOs) on both field books and other M&E tools. There should be budget for capacity building.
- For use of other M&E forms by partners, clear guidelines (on forms) should be annexed to each agreement and copies of such tools should be giving to partners when agreements
- N2Africa should assist in training needs assessment to identify such training gaps and provide appropriate training (part of partnership agreements and budgets)
- Minimum agronomic data required to be collected: demo, registration of adaptation farmers->intent to get feedback. Where applicable and with capacity, nodule counts should be integrated in the agronomic data (to be included as criteria in the technology evaluation tool where needed)
- Data on Focal adaptation and technology evaluation should be based on willingness and capacity of partners (register in agreements)
- Partners should be **selected based on capacity**. The same goes for **Data collectors** within specific partnerships

2. Partner's own systems are incompatible with N2Africa system but partners are willing to provide N2Africa with data

- N2Africa staff present during implementation of partnership activities should fill the N2Africa data forms (will be ODK)
- All Partnership agreements **must have** as annexed an agreed **minimum milestones (N2Africa related milestones)** to indicate the results areas for the partnership
- Where partners agree to use their system to provide data for the partnership, prior agreement with such partners to fill the "**Partnership Data template_End of year**" is paramount. Such partners will review the above data template to provide the basis for N2Africa data needs. Partners will fill out at **end of season** to have data on all key indicators
- In case of data already collected by partners, data analyst, BDO or FLO can liaise with partner M&E person to fill "**Partnership Data template_End of year**" in addition to the copy of the partner's annual report



Appendix I: Program

Day 3 – Wednesday 29 th July, 2015			Venue
Session Chair - Ken		Presenter/Facilitator	Rapporteur
14:00-14.30	Inventory of issues to cover	Ken Giller	
14:30–16:00	Review of tailoring approaches	Andy Farrow	
16:00-16:15	TEA		
16:15–17:45	Early impact Assessment	Greta van den Brand	
END OF DAY THREE			

Day 4 – Thursday 30 th July, 2015			Venue
Session Chair - Fred		Presenter/Facilitator	Rapporteur
Time	Topic	Presenter/Facilitator	Rapporteur – Lorraine Odhiambo
08:30– 10:30	N2Africa Issues Arising – Focus on Learning Loops	Ken Giller	
10:30- 11:00	COFFEE		
11:00–13:00	Group work	Ken Giller	
13:00– 14:00	LUNCH		
14:00– 16:00	Reporting back	Fred Kanampiu	
16:00-16:15	TEA		
16:15– 17:30	Data flows and analysis	Joost van Heerwaarden, Theresa Ampadu-Boakye	
END OF DAY FOUR			

Day 5 – Friday 31 st July, 2015			Venue
Session Chair - Fred		Presenter/Facilitator	Rapporteur
Time	Topic	Presenter/Facilitator	Rapporteur – Lorraine Odhiambo
08:30–10:30	Synthesis of previous day	Fred Kanampiu	
10:30- 11:00	COFFEE		
11:00–13:00	N2Africa in the bigger picture – where do we want to be by the next meeting in February	Ken Giller	
13:00–14:00	LUNCH		
14:00–16:00	Writing	Fred Kanampiu	
16:00-16:15	TEA		
16:15–17:15	Annual Report	Fred Kanampiu	Greta van den Brand
17:15–17:30	Closing & Departure		
END OF DAY FIVE			



List of project reports

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



33. N2Africa Annual country reports 2011
34. Facilitating large-scale dissemination of Biological Nitrogen Fixation
35. Dissemination tools produced
36. Linking legume farmers to markets
37. The role of AGRA and other partners in the project defined and co-funding/financing options for scale-up of inoculum (banks, AGRA, industry) identified
38. Progress Towards Achieving the Vision of Success of N2Africa
39. Quantifying the impact of the N2Africa project on Biological Nitrogen Fixation
40. Training agro-dealers in accessing, managing and distributing information on inoculant use
41. Opportunities for N2Africa in Ethiopia
42. N2Africa Project Progress Report Month 30
43. Review & Planning meeting Zimbabwe
44. Howard G. Buffett Foundation – N2Africa June 2012 Interim Report
45. Number of Extension Events Organized per Season per Country
46. N2Africa narrative reports Month 30
47. Background information on agronomy, farming systems and ongoing projects on grain legumes in Uganda
48. Opportunities for N2Africa in Tanzania
49. Background information on agronomy, farming systems and ongoing projects on grain legumes in Ethiopia
50. Special Events on the Role of Legumes in Household Nutrition and Value-Added Processing
51. Value chain analyses of grain legumes in N2Africa: Kenya, Rwanda, eastern DRC, Ghana, Nigeria, Mozambique, Malawi and Zimbabwe
52. Background information on agronomy, farming systems and ongoing projects on grain legumes in Tanzania
53. Nutritional benefits of legume consumption at household level in rural sub-Saharan Africa: Literature study
54. N2Africa Project Progress Report Month 42
55. Market Analysis of Inoculant Production and Use
56. Identified soyabean, common bean, cowpea and groundnut varieties with high Biological Nitrogen Fixation potential identified in N2Africa impact zones
57. A N2Africa universal logo representing inoculant quality assurance
58. M&E Workstream report
59. Improving legume inoculants and developing strategic alliances for their advancement
60. Rhizobium collection, testing and the identification of candidate elite strains
61. Evaluation of the progress made towards achieving the Vision of Success in N2Africa
62. Policy recommendation related to inoculant regulation and cross border trade
63. Satellite sites and activities in the impact zones of the N2Africa project
64. Linking communities to legume processing initiatives
65. Special events on the role of legumes in household nutrition and value-added processing



66. Media Events in the N2Africa project
67. Launch N2Africa Phase II – Report Uganda
68. Review of conditioning factors and constraints to legume adoption and their management in Phase II of N2Africa
69. Report on the milestones in the Supplementary N2Africa grant
70. N2Africa Phase II Launch in Tanzania
71. N2Africa Phase II 6 months report
72. Involvement of women in at least 50% of all farmer related activities
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Partners involved in the N2Africa project



A2N



Bayero University Kano (BUK)



Caritas Rwanda



Diobass



Kwame Nkrumah University of science and Technology



Resource Projects-Kenya



Sasakawa Global; 2000



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World Vision