

Trip report: World Vision, Beylene Sen Tol Project, Senegal



Primary school students with *Acacia colei* trees (5 yrs) along compound border, Ndimb Korki village, Kaffrine region, Senegal.

Fatick & Kaffrine, Senegal, West Africa
11 – 21 June 2014

By Peter Cunningham: Agriculture & Agroforestry Consultant.

Summary:

A field visit to the World Vision (WV) Beylene Sen Tol (BLST) project in Senegal was completed from 11-22nd June 2014. The main purpose of the visit was to monitor and provide support to the Farmer Managed Natural Regeneration (FMNR) and food security interventions of the project and to scope the potential for FMNR enrichment with edible multi-purpose acacias in a potential future phase of the project. The main trip activities were focused around the Terms of Reference. This report is presented as a trip narrative, together with comments, conclusions and recommendations given for each Term of Reference.

Acacia colei trees are restricted to the Kaffrine region of Senegal and were planted from 2008. They have been planted for land restoration, in school and house compounds and as windbreaks in garden areas. It was not possible to obtain data on the number of trees planted. Most *A. colei* appeared to be well adapted and all seed pods observed were of the variety *ileocarpa*. There had been no management of trees after planting. In 2014, 15,000 *A. colei* seedlings were being produced in Kaffrine for planting in the Kaffrine and Fatick regions.

If the multi-purpose benefits of existing *A. colei* trees are to be realized, training seminars and practical demonstrations are needed in communities with *A. colei* trees. Pilot farming system demonstrations with *A. colei* such as the Farmer Managed Agroforestry Farming System (FMAFS) could be established by lead farmers in Kaffrine and Fatick in 2014 to enrich FMNR and increase farm production and resilience.

There is significant scope for a Phase II- BLST project based on both better quality (Multi-stemmed) and scale up of FMNR, together with FMAFS with village based tree nurseries. Field trials with other edible acacias species including *A. torulosa* and *A. tumida* should be conducted in collaboration with the Agricultural Research Institute of Senegal (ISRA). Further development of acacia based foods, including the *A. colei* based weaning formula developed in Niger should be adapted to Senegal.

Whilst the BLST project has achieved significant success with widespread FMNR adoption, both the quality and form of FMNR could be greatly improved by increasing tree densities from 40 to 100-120 trees/ha with multi-stemmed pruning for sustainable wood production. Scale up of FMNR should now move to a National program in Senegal. Serious attention should be given to eliminate crop residue burning via crop residue mulching and FMNR starting in November.

There appeared to be limited potential for acacia research trials in collaboration with the Beersheba project due to the predominance of heavy clay loam soils, but spaced row trials of *A. colei* could form a useful observation trial at this location.

A comprehensive acacia awareness seminar with an acacia food demonstration in Kaffrine was well received and gave a large range of stakeholders a good foundation and confidence to move forward with edible acacia research and development in Senegal. There was strong interest and motivation to develop a communication plan for acacia scale up and progress the human food potential. This could have a significant role in combatting malnutrition, improve food security and farm resilience through adaptation to climate change.

A concluding de-brief seminar was presented in the WV national office to highlight key observations, and present some recommendations for project improvement and potential development of a BLST phase II project.

A range of technical papers, photos and other journal papers on FMNR and edible acacias were left with Chris McMillan for use by the BLST team.

Introduction:

The Beylene Sen Tol project (BLST) is one of the initiatives developed under World Visions Senegal (WVS) environment program with a general goal to “Sustainably improve the economic and environmental livelihoods of poor rural households in Senegal”. There were also three other more specific goals: 1. Households in Kaffrine effectively manage the environment and food security needs; 2. WVS influences national policies and practices on the environment and food security; 3. An economic and environmental model for sustainable agriculture is tested and adopted in Fatick and Kolda. The project started in October 2011 and was due to finish in March 2015.

The main project base was at Kaffrine with a range of interventions throughout the Fatick, Kaffrine and Kolda regions of Senegal. Both Fatick and Kaffrine are in the Sudano-Sahelian climatic zone with 650-700 mm average annual rainfall which occurred between June-September. Kolda further south is in the Guinea -Savannah climate zone with approximately 1100 mm average annual rainfall.

Prior to the BLST project, the Senegal Food and Livelihood Enhancement Initiative (SFLEI) project (November 2007 to June 2011) had made a significant impact on environmental restoration and improved household food security and incomes in this region of Senegal. One of the main activities in both the SFLEI and BLST projects was Farmer Managed Natural Regeneration (FMNR), a rapid tree regeneration method that could reverse the devastating environmental degradation and biodiversity loss that had occurred in the region in past decades due to tree clearing that made way for annual cash crops (e.g. peanuts) for export markets.

In addition to FMNR, the SFLEI project had also introduced *Acacia colei*- a fast growing, drought tolerant tree with high protein seed that had been developed and incorporated into human food in the Maradi region of Niger. A new integrated agroforestry farming system (FMAFS) that incorporated FMNR and edible acacias (Incl. *A. colei*) had also been developed in Maradi to enrich FMNR (FMNR+).

With the BLST project coming to a close in 2015, what might be a logical next step to build on the success of FMNR and other activities to improve food and livelihood security?

The following trip report aims to address the main Terms of Reference that embrace both monitoring and technical support, especially for FMNR, *A. colei* and other food security intervention aspects of the project in preparation for a final evaluation of the project (Jan-Mar 2015). There was particular emphasis on scoping for the long term sustainability of the BLST project with focus on improvements to FMNR and the potential research and development of edible acacias (e.g. *A. colei*) and other crops in Senegal.

Objectives of visit:

There were six main objectives:

1. Survey and review *Acacia colei* research and development in Senegal.
2. Assess, discuss and make recommendations for multi-purpose Australian acacia research and development for restoration of degraded lands, use in agroforestry and for enriching FMNR.
3. Visit FMNR sites and assist with technical inputs for improvement and scale up.
4. Visit the Beersheba project and assess potential for collaboration re: acacia trials and development.
5. Conduct acacia awareness seminar(s) to relevant stakeholders- WV staff, government research and extension agencies.
6. Provide other technical services as required.

Main Activities and Comments:

Travel to Dakar, Senegal, Tuesday-Wednesday 10-11th June.

Air travel from Melbourne to Dubai and Dakar. A meeting was held with Chris McMillan in the evening to plan the program and activities.

Security brief and travel to Fatick- visit to FMNR sites, Thursday, 12th June.

Introductions to the WV national office and a security brief were completed and the rest of the morning was spent travelling from Dakar to Fatick. There were significant areas of salt affected land and salt harvesting from sea water enrichment in evaporation ponds. Significant areas of tree planting (*Eucalyptus calmdulensis*, *Melaleuca acacioides*, and *Acacia seyal*) had been completed to help combat the advancement of salt affected land.

A visit to the WV Fatick sub-base office included introductions to staff. Good discussion and exchange occurred with Anna Daba Ndiaye, Livelihoods manager.

Field visits to FMNR sites were completed in the afternoon. At the first site, Aliou Ndong a key project extension agent with the Mbellacadio community showed us an enclosed are with a tree nursery (3000 seedlings (Included *A. mellifera*, *A. seyal*, *Ziziphus mauritania*, cashew, mango and lemons), Mango grove and adjacent to this area (approx. 1 ha) community children had completed an FMNR exercise on 6th June- World environment day. There was a good density of trees (Mostly *Guiera senegalesis*) pruned with multi-stems and a significant amount of crop residue between trees being raked for burning. Farmers were active in adjacent farms cutting shrubs, raking crop residues and burning this material in preparation for sowing cereal crops.

It was suggested that the FMNR area would make a good pilot FMAFS site with spaced boundary trees and some internal rows of *A. colei*. A further relatively bare field with some large *Faidherbia albida* trees (~ 1 ha) was also selected for a potential FMAFS demonstration site. Approximately 670 ha of FMNR had been completed by the Mbellacadio community in 2013. Recent measurements indicated that the average tree densities for this FMNR of trees was approximately 23 trees/ha.



Chris, Aliou, Papa & Anna at the community FMNR site



*Aliou with multi-stemmed FMNR
(*Nguer- Guiera senegalesis*)*

Good discussion and options for two potential FMAFS pilot sites in this area were discussed, then Chris spent time with the farmer (Mamadou), outlining some potential tree layouts using *A. colei* and *Ziziphus mauritania*.



Second FMNR site in farmer's field. Note bare ground (High diversity of trees).

At the second field site, FMNR had been completed by a farmer who had learnt the technique from his brother who had received FMNR training from the project. There were over 10 species of trees in this area- 50 x 50 m. with some multi-stem pruning.

A most notable aspect of the landscape throughout the Fatick and Kaffrine regions was the general lack of trees and bare fields. There was almost a universal practice of racking up crop residues into pile or rows and most small shrubs (regrowth from stumps) were cut to give clean fields. All residues were burnt to produce clean fields ready for annual crop sowing with small mechanical seeders towed behind horses/cows/donkeys.



Typical field with large trees, but all small shrubs cleared and crop residues raked and burned.

Visit to Beersheba project, Friday, 13th June.

The Beersheba project (50 km from Fatick) was established in 2002 by Eric Toumieux on 100 ha of barren enclosed land in a 600-650 mm annual rainfall area. There had been significant natural regeneration of indigenous tree species, dominated by *A. seyal*. Eric had been the director of WV Senegal from 2004-2009 and had been greatly influenced by two visits to Niger to see the impact of FMNR on livelihood improvement. The Beersheba project was a training school for young Christian interns who were discipled in faith and taught a wholistic view of the Church and the Kingdom of God. A significant aspect of this course was caring for creation, modeling a kingdom lifestyle, land restoration and sustainable food production from crops, vegetables, fruit trees and various animal enterprises including income generation.

The farm tour led by Eric showed how this holisitc training school was operating. One aim of this visit was to assess if there was scope for any edible acacia species trials on site and if the project was interested in evaluating these species. There were 8-10 *A. colei* trees on site that had been planted approximately 10 years ago. These were 6-7 m high and appeared well adapted to the generally heavy clay loams. Following discussions about acacia in farming systems, Eric suggested that the project could plant 200 *A. colei* trees as spaced tree rows on farm borders. Plans were made to send *A. colei* seedlings from the Kaffrine nursery during the rainy season for planting.



Beersheba project: Enclosed area with natural regeneration of trees.



*Harvesting of *A. seyal* for mulching and charcoal*



FMNR in cropping field with crop residue mulching. Moringa and onions under drip irrigation

Meeting and seminar with ISRA in Fatick, travel to Kaffrine. Saturday 14th June.

The scheduled meeting with Forestry researchers at the Agricultural Research Institute of Senegal (ISRA) at Bambej was cancelled and instead an informal discussion and Power Point presentation (General overview of edible acacias) was given to Dr. Babou Ndour an Agroforestry researcher at ISRA with Chris in the WV Fatick office. Babou outlined some early evaluations (~20 years ago) with edible acacias by ISRA in Senegal and concluded that most had not been adopted due to their short life span. In view of our discussions and the more recent developments with edible acacias, there was however, interest in collaborative trials at ISRA stations and with farmers. A number of potential sites were mentioned and will need follow up.

On arrival in Kaffrine, we were met by Martin Nzale who took us to a re-fresher course on acacia foods comprising 18 participants from 8 communities in the Kaffrine area. This group had received extensive training in acacia based food from Mariama Tsayabou (from Maradi, Niger) from 15-17th July 2013. It was encouraging to see the enthusiasm of these participants (mostly women) and to taste the various foods that had been prepared.



Participants in acacia based food re-fresher course at Kaffrine. A. colei flour used in local foods.

Church in Kaffrine and rest, Sunday 15th June.

An enjoyable morning was shared at the Assembly of God Church in Kaffrine. The afternoon was spent resting and in preparations for the Acacia awareness seminar.

Visit FMNR sites in the Kaffrine area, Monday 16th June.

Most of the day was spent travelling with the project extension agents to various farms with FMNR. There were still significant areas with traditional land clearing and burning of crop residues in preparation for annual crop sowing (see below).



Typical field site: All shrubs removed and crop residues burnt.

Good examples of FMNR were observed fields in the Malem Hodar village. There was a good diversity of trees- but again most of the FMNR was single stemmed or a larger tree -2-3 yrs of age with one smaller stem left beside the main stem.



Typical FMNR fields with grass/crop residues and also clear areas ready for cropping.

There was considerable pressure from Fulani nomads (camped in the area) who were illegally cutting tree branches to provide fodder for their animals. Requests for assistance from Forest guards to come and provide support were met with negative responses- they did not have the time or resources (fuel)? This meant that the Fulani nomads were able to cut trees without any real penalties/deterrence.

Some discussion re- timing of FMNR and the need to develop a multi-stemmed system of sustainable wood production was shared with the extension agents.

Survey and review Acacia research and development in Kaffrine, Tuesday 17th June.

A good briefing on the background and introduction of *Acacia colei* (also known as *A. holosericea*) by WV Senegal was outlined by Martin Nzale (BLST program co-ordinator). *A. colei* was originally planted from 2008 for windbreaks and land rehabilitation (e.g. Diassoum Valley) in the Kaffrine region. There were also significant numbers of *A. colei* planted in school compounds (~ 20) and village compounds. The short-lived nature of these trees (4-5 yrs) and high susceptibility to wind damage had led to limited adoption. Martin's participation in the Niger Edible Acacia Network meeting in Maradi, Niger (1-2 March, 2012) led to significant interest in using *A. colei* seed for human food. Successful acacia food training sessions were completed from 17-19th July, 2013 at the Catholic Mission in Kaffrine by Mrs Mariama Tsyabou (Niger) with assistance from WV Niger and an interpreter. There were approximately 50 women represented from seven ADP's in the Kaffrine region, four ADP's in the Fatick region and one ADP (Kolda) in the Velingara region. The main aim of these training sessions were to improve food quality by incorporating high protein acacia flour into local diets. There was growing interest within a range of women's groups for acacia based foods. One particular women's forestry group had planted 15,000 poly pots with *A. colei* in the Kaffrine Water and Forests tree nursery area in 2014.

In general, *A. colei* had been planted and used in three ways: 1. Windbreaks, 2. Land rehabilitation/re-forestation, 3. School, household and market garden enclosures.

The first field visit was to a large enclosed valley (2.5 km x 400-600 m- protected by wire fencing) - the Diassoum Valley. A large re-forestation project had planted a range of trees including *A. colei* from 2009-2012. There had been no follow up management of these trees and village women had collected acacia seed for a number of years. Some *A. colei* trees had died after 4-5 years, but most (see photos) were healthy and producing good quantities of seed. Some rows of *A. colei* trees 1.5 to 2 m apart had good pole form.



A. colei trees (4-5 yrs) in the Diassoum Valley.



2 yr. old *A. colei* (Note pole potential)

The second field site was in the Ndimb Korke village where approximately 45 mature *A. colei* trees had been planted just inside the walled compound of the primary school. These trees planted in 2008 had grown to 8-9 m in height and produced large quantities of seed (>100 kg of seed in 2014). There had been limited pruning of lower branches. A brief demonstration of how to prune these trees to obtain significant firewood was given. These trees clearly demonstrate the significant potential that *A. colei* could have in this region for biomass, wood and seed production and for income generation.



Primary school children with A. colei border trees (5 yrs) Note high wood/biomass from A. colei (5 yrs)

The third field visit was to a small enclosure (20 x 20 m) for cassava and vegetable production in the village of Duggaballa. *A. colei* trees (1-2 m apart) had been planted in 2013 just inside the fence line of this enclosure as a potential windbreak.

Following a lunch back at the WV Kaffrine base, the Kaffrine women's forestry group tree nursery with 15,000 *A. colei* seedlings was visited. Excellent success rates for *A. colei* propagation in poly pots had been achieved. The BSTL project had commissioned the production of these seedlings- 12,000 were planned for use in the Kaffrine region and 3,000 selected for planting at Fatick.



A. colei trees (1 yr.) as border trees in a Garden enclosure. Duggaballa village



Women's forestry group with A. colei seedlings Kaffrine- Water and Forests tree nursery.

Acacia awareness seminar in Kaffrine, Exchange with BLST extension agents, debrief and recommendations. Wednesday 18th June.

An introductory Acacia awareness seminar was presented in a community building in Kaffrine: 10:30 am-2:00 pm. The main purpose for this seminar given in French with translation to Wolof was to help participants gain a good understanding of the potential multi-purpose use of edible acacias for degraded lands and agroforestry use to enrich FMNR in Senegal.

The main points outlined in this seminar included:

- Context- Need for new crops with climate adaptation for Sahelian zone. (Less rainfall, poor soils, reduced food security from annual cereals).
- Aust edible acacias have excellent attributes.
- *A. colei*> 20 yrs. development in Niger.
- Multi-purpose agroforestry trees.
- Farming systems integrated with FMNR and crops.
- Developments in Niger, Tigray, Ghana....
- WVA, Food security & climate change team available for collaboration/support.



Some of the participants in the Acacia awareness seminar. Martin Nzale & Chris McMillan leading Questions and answer session.

There were approximately 70 participants in this seminar with wide representation- BLST staff, WVS staff from livelihoods and health groups, extension agents, farmer leaders, women's groups from Kaffrine, Fatick and Kolda areas, government agencies, incl. Water and Forests, presidents of rural communities in Kaffrine and a range of development agencies. A highlight of this meeting was an acacia food demonstration for morning tea and some of the lunch dishes had also been enriched with acacia flour. There was significant interest in developing a regional program to scale up multi-purpose edible acacias. A comprehensive question and discussion time was led by Martin Nzale.

A valuable exchange with recommendations was given to the BLST staff (7 from Kaffrine, 1 from Fatick and 1 from Kolda with 2 Co-ordinators) at the WV Kaffrine base in the late afternoon. This meeting also provided opportunity to seek feedback from the BLST staff on what activities could be include in a future Phase II of the BLST project. These activities could include:

- Scale up of FMNR- National program with higher tree densities and sustainable wood harvesting
- Early FMNR practice with an end to crop/tree pruning residue burning.
- Development of fruit production from indigenous trees (Baobab, Ziziphus)
- Awareness building for *A. colei* management
- Acacia research and development with ISRA
- Potential use of fortified crops- High iron millet, orange cassava and sweet potato
- Animal control and policies to protect the environment from nomad pressure
- Exchange visits to other regions for information transfer/training

Travel to Dakar Thursday 19th June.

Most of the day was spent travelling from Kaffrine to Dakar and preparations for a final exchange, review and debrief at the WV National office.

Exchange, trip review, debrief with WV National office staff in Dakar. Friday 20th June.

A final exchange, review and debrief session was completed with Justine Tossou (Grant Acquisition and Management Manager) and Chris McMillan. A summary Power Point covered observations, comments

and recommendations based on each of the Terms of Reference for the project visit. This provided a useful guide for summary exchange and discussion (see section below: Comments, conclusions and recommendations for Terms of Reference).

Travel to Accra Ghana on route to Talensi II project. Saturday 21st June.

Travel to Accra with Gambia Bird. 9:30-12:00 am.

Comments, conclusions and recommendations for Terms of Reference.

1. Survey and review *Acacia colei* research and development in Senegal.

- There had been limited research and development with *A. colei* in Senegal. It was encouraging to visit the *A. colei* food refresher course in Kaffrine (18 participants from 8 communities) and observe a range of foods with 25% acacia flour. The acacia flour appeared darker which was probably due to a higher seed coat content. It was clear that the acacia food training seminars conducted in July 2013 had been helpful and there was strong interest to continue to develop acacia based foods.
- *A. colei* was restricted to the Kaffrine region of Senegal and was being used for land restoration (e.g. Diassoum Valley), in school and house compounds and as windbreaks in garden areas. All trees had been well protected and appeared well adapted with excellent growth rates.
- It was not possible to ascertain how many *A. colei* trees had been planted, where and at what times (yrs). It was suggested that this data could be obtained from internal WV reports. It was recommended that Chris & Martin make a brief summary of the number of trees planted, locations and years. Wherever seed pods were observed on *A. colei* trees, they were of the coiled pod type- **variety ileocarpa.**
- 15,000 *A. colei* seedlings were being produced in Kaffrine for distribution to farmers in the Kaffrine and Fatick regions. The plan was to plant these in school/household compounds and farm borders.

2. Assess, discuss and make recommendations for multi-purpose Australian acacia research and development for restoration of degraded lands, use in agroforestry and for enriching FMNR.

- There had been no/limited management for *A. colei* trees in each of the locations where they were observed.
- Training seminars and practical demonstrations of *A. colei* silviculture (Planting, management, pruning, seed harvesting) are needed for communities with existing populations of *A. colei* of varying ages. These seminars should include multi-purpose development and use.
- A number of pilot farming systems (FMAFS) demonstrations/trials could be established on selected farms in 2014 in the Fatick and Kaffrine areas to demonstrate one method for enriching FMNR. At least two sites were suggested at Fatick and a range of other farms could be readily established in the Kaffrine area using trees currently being produced in the Kaffrine tree nursery.
- If there is a positive project evaluation (Jan-Mar 2015) and a further **Phase II** of the project is recommended, then enrichment of FMNR with multi-purpose acacias in agroforestry farming systems would be a significant livelihood improvement, helping to restore the environment, improve farm productivity, income, resilience to droughts and adaptation to climate change.
- The production of acacia tree seedlings in just one centralised tree nursery (Kaffrine) whilst efficient with a high success rate, does not foster village ownership and has limitations for sustainability.
- Acacia tree nurseries should be established in villages where communities will plant and develop acacias in the future.

- Field trials with other edible acacia ssp. *A. colei*, *A. torulosa* and *A. tumida* should be conducted in collaboration with ISRA at research centres and farmers' fields to ensure that appropriate species and provenances are selected to perform well in the target environments in Senegal.
- It is vital that all acacia trees are protected from grazing animals in the first year and until they are large enough to withstand animal pressure.
- Further development, refinement and training in *A. colei* based foods should be completed within all target communities.
- The *A. colei* based weaning formula developed in Niger (15% acacia flour) and comprising locally grown ingredients should be adapted to Senegal and could form the basis of supplementary food distributions or assistance to malnourished children and communities.
- Key team members from the WVA team could assist with follow up visits for acacia management, food development and farming systems training.
- This team could also assist with project design & development

3. Visit FMNR sites and assist with technical inputs for improvement and scale up.

- The most startling general observation of the landscape (Fatick to Kaffrine) was the vast expanses of land with few trees, bare soil and enormous waste of organic matter through burning of all/most crop/shrub residues. This traditional farming practice must be having a serious negative impact on soil fertility and a major cause of ongoing land degradation. Even in most of the FMNR areas there appeared to be limited understanding/teaching re- crop residue mulching. Some of the residue burning in FMNR fields appeared to be very intense leading to tree death or very slow recovery.
- Serious attention should be given to establishing at least a few demonstration farms with FMNR and a complete elimination of burning with crop residue mulching. The main reason for crop/fodder/tree residue burning was to enable sowing of annual crops with small machines that could only operate when the soil was bear or with very limited surface residues. One practical solution to this challenge would be to complete crop residue mulching and the main FMNR tree pruning in **November**, soon after the annual crop harvests when crop residues are dry. Millet or sorghum (if not uses for animal fodder) should be laid flat in fields and cut into smaller pieces. This practice would allow at least 5-6 month of termite activity which would reduce/mulch most of this material with good soil incorporation. There may be other methods/techniques available that can help to eliminate burning.
- Whilst the project interventions/training has led to 1000's ha of FMNR in the Kaffrine area and is the general practice in some communities, there are large areas in ADP's void of FMNR. Even the best examples of FMNR observed (2 days of field visits) showed a predominance of single stemmed trees and recent assessments showed an average tree density of 40 trees/ha. It is clear that some areas had limited FMNR potential due to past programs to remove all tree stumps.
- There should be a concerted effort in both the Kaffrine and Fatick regions where field do have tree stumps to increase tree densities to 100-120 trees/ha and both demonstration and training with multi-stemmed FMNR of trees. This would enable sequential harvest of tree wood from farms and significant improvements in farm income and soil fertility/crop production.
- Scale up of FMNR should now move into a National program embracing all ADP's and beyond.
- Certain areas where FMNR has become a base land use practice could step up to another level with **FMNR + or RNA+**. This next step could be based on the FMAFS concept. Some demonstrations (1/2-1 ha farm layouts) could be established with lead farmers in 2014. A vital requirement of this system would be protection of young trees from grazing animals.
- There would also be widespread planting of the excellent agroforestry and fertilizer tree *Faidherbia albida*.

4. Visit the Beersheba project and assess potential for collaboration re: acacia trials and development.

- The Beersheba project was modelling and teaching Holistic and biblical land management and worldview change for Christian interns to impact future generations in Senegal.
- The enclosed area with heavy clay/loam soils and 600- 650 mm annual rainfall had a high indigenous tree population due to FMNR for at least 10 yrs.
- In general *A. colei* trees are more suited to sandy loam soils so it was decided to establish some in rows of *A. colei* 4-5 m apart (200 trees) in 2014 as an observation trial. *A. colei* seedlings could be brought from Kaffrine and established during the rainy season. It would be important to ensure these tree are well cared for and observation visits completed from time to time.

5. Conduct acacia awareness seminars to relevant stakeholders- WV staff, government research and extension agencies.

- The comprehensive acacia awareness seminar with translation to Wolof was very successful.
- It was important to outline the context and need for new food crops with climate adaptation for the Sahelian zone. (Diminishing and unreliable rainfall, poor soils, with reduced annual cereals).
- The multi-purpose, edible acacias have excellent attributes to help combat these challenges.
- *A. colei*> 20 yrs. development in Niger as a multi-purpose agroforestry trees and now in farming systems integrated with FMNR and crops.
- Developments in Niger, Tigray, Ethiopia and the upper east of Ghana.
- There were good awareness outcomes, robust comments, discussion, questions.
- There appeared real interest and motivation to scale up edible acacia development in Senegal.
- A significant part of this interested revolved around human food development.
- It is recommended that this interest and potential be taken forward into a new phase of the BLST project.
- The WVA, food security & climate change team are available for collaboration/support for project design and technical support, including training.
- It was great to see Martin Nzale and Chris McMillan lead and engage well with the wide range of participants.

6. Provide other technical services as required.

- There was limited scope and time on this visit to provide other technical services, but there appears to be great need for technical support of WVS projects such as the BLST. Advice, mentoring and providing networks for technical information to staff with limited experience could make a significant improvement and impact. Should a further phase of the BLST project be recommended there is great scope for enrichment of FMNR to FMNR/RNA+ via agroforestry farming systems which will require technical support.
- A range of technical papers, photos, journal papers given to Chris McMillan via memory stick.
- It is recommended that Chris translate three key technical notes/papers on FMNR and edible acacias into French for use by the BLST team.

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Special thanks are given to the WVS team and especially the BLST team in Kaffrine, including: Mr. Chris McMillan (BLST project manager) for overseeing all aspects of my visit, Martin Nzale for field and seminar preparations and Pape Koume for safe travel. I also thank the WVS national office- Mrs Justine Tossou for debrief exchanges and others for security briefing, accommodation arrangements and finally Mr. Rene Onte (WVA, Country programs manager, Senegal...) for developing the consultancy and various administrative advice/support.

Appendix 1. Terms of Reference: Peter Cunningham's Field Visit.

Project Title: Beylene Sen Tol.

Background:

The Beylene Sen Tol Project aims to sustainably improve the economic and environmental livelihoods of poor rural households in Senegal. It has the following outcomes:

Result 1 – Households in Kaffrine effectively manage their environment and food security needs.

Result 2 - WV Senegal influences national policies and practices on the environment and food security.

Result 3 – An economic and environmental model for sustainable productive agriculture is tested and adopted in Fatick and Kolda.

Key activities include Farmer-Managed Natural Regeneration (FMNR), tree-planting and recovering land lost to salinity, bushfire management, market gardening, rice/honey/jatropha production, trainings and awareness-building related to better environmental management practices which result in better food security and opportunities to improve rural incomes.

The Project began in October 2011 and is due to finish in March 2015. As such, the Australian FMNR consultant, Peter Cunningham, will visit Senegal in preparation for the final evaluation of the Project and an assessment for a potential scale-up phase in environmental management and food and livelihood security.

Objectives:

- To provide technical support in assessing the progress and scoping the long-term sustainability of the Beylene Sen Tol Project, with particular focus on reviewing the acacia tree adoption under the Project, including opportunity for conducting research trials regarding the use of edible Australian Acacia and other crops in Senegal.
- To monitor and provide support for the FMNR and food security interventions aspects of the Project.

Travel and Activity Plan:

Travel Plan:

11 June 2014: Arrive Dakar, Senegal (1 day)

12 – 20 June 2014: 09 days

21 June 2014: Depart Dakar for Accra, Ghana (1 day)

Activity Plan:

- 1) Survey and review *A. colei* R&D in Senegal.
- 2) Assess, discuss and make recommendations for edible, multi-purpose Acacia R&D for degraded lands and agro-forestry use in Senegal-enrichment of FMNR (FMAFS).
- 3) Visit FMNR sites and assist with technical inputs/scale up.
- 4) Visit the Beersheba natural regeneration project and assess potential for collaboration re: Acacia trials/development.
- 5) Conduct an Acacia introductory seminar(s) to relevant stakeholders (WVS staff, government research and extension agencies).
- 6) Other technical services as required.