

**Training of Agricultural Value Chain Concepts for
University Lecturers in Ethiopia – FtF Assignment ETH037**

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List of Acronyms

FtF	Farmer-to-Farmer
IDE	International Development Enterprises
IITA	International Institute of Tropical Agriculture
IRRI	International Rice Research Institute
NGO	Non-Government Organization
PTO	Power Take Off
SAFE	Africa Fund for Extension Education
USAID	United States Agency for International Development
WFP	World Food Program

Executive Summary

This FtF volunteer consultancy was undertaken to assist lecturers in extension education to develop appropriate curriculum for value chain analysis in their academic programs. The consultancy was hosted by SASAKAWA SAFE and lasted for three weeks starting 2 March. The central feature of the consultancy was a weeklong training workshop. This was preceded by a week of field visits and followed by a wrap-up week.

The week preceding the workshops included an emphasis on post-harvest processing and the prospects for mechanizing this to enhanced crop recovery with mechanical threshing and enhance quality through mechanical winnowing by reducing the amount of foreign material in the grain. Both of which leads to increased total value as more grain would be marketed and not have to be discounted for the foreign material that would have to be clean out later in the value chain. This also represented areas where contract service providers could provide a substantial contribution to smallholder communities. Additional visits included a very small dairy operation to convert milk to butter as part of a women income generation “financial empowerment” effort. However, this appeared poorly designed and needs to be completely reviewed if it is to be sustainable beyond any external initial facilitation. The final visit of subsequence was to a grain cooperative. As appears to be the common feature of cooperatives used for agriculture development the business model appears too cumbersome to attract a large percent of the market so that most members divert the bulk of their crop to outside dealers. In this case it was commanding about 1/4th the production of its members, and operating outside the main grain value chain as its primary customer was the WFP instead of consumers.

The workshop was attended by 24 participants representing seven different universities distributed across Ethiopia. It lasted four days and included presentations, discussions and working group meeting. The presentations looked at the contributions Value Chain representing producers were utilized in the USA and prospect promoters were conveying the impression of a higher degree of involvement than reality. It also looked at the overall cooperative business model that was associated with value chain promotions and asked if perhaps they were just too administratively cumbersome and too inconvenient to attract a wide spread active participation on the part of the smallholders they recruited and were supposed to be serving.

The workshop then continued to look at how the value chain could be enhanced starting at the farm level where farmers still have the most direct control, and continuing toward the consumer. The farm level also looked at dietary energy balance and recognized that farmers might only have enough energy in their diet to work 4 to 5 diligent hours a day. This could greatly extend the time needed to complete various manual tasks and brings into question if a smallholder family, restricted to manual operation with hoes, etc., can realistically dig themselves out of poverty. The result was enhancing the value chain at the farm level would need to carefully look at mechanization service providers to reduce the drudgery with contract tillage, and consistent with the pre-workshop visit contract threshing and grain cleaning.

Above the farm level the first concern is to recognize that while the further up the chain the farmers remain involved the higher the gross returns might be, but also the higher the costs incurred to obtain those returns. Thus the need for a pure economic analysis to determine at what point the added costs exceed the added benefits. At that point the farmers will be financially better off transferring the value chain to other entities. The second concern is the extent farmers should be involved with value added vs. have this be outsourced. Given the limited available labor, the labor would most likely be better used enhancing values at the farm level, where the farmer has control and out-sourcing the additional value added. This seems to be the preference in converting cassava to gari or parboiling and milling rice as noted in Nigeria. Advancing up the value chain was a question of looking in detail at a case study of the marketing channel for tomatoes in Nepal, and transportation as farm locations became more remote. It also looked at the need to possibly modify micro-credit programs to cover both the capital costs and operating cost to assist service providers effectively assist with the value chain process.

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Introduction

This three week Farmer-to-Farmer volunteer consultancy was to provide a continuing education training workshop to university lecturers from seven universities in Ethiopia on Agriculture Value Chains starting with the producer and ending with the consumer. The overall objective was to determine how smallholder farmers could obtain the maximum net value from their total farm enterprise system. The material would then be used by the lecturers to develop a curriculum on value chain as part of an agriculture extension academic program. The consultancy was hosted by Sasakawa Africa Association (SAA) through Sasakawa's Africa Fund for Extension Education (SAFE). The three week consultancy ran from 2nd to 22nd March 2013 and was divided into one week of advance field visits to see some of the value chains operating in Ethiopia as this was my first visit to Ethiopia, a week of actual training, and a follow-up week for wrap up, to prepare the workshop material for distribution to the participants as a DVD, and to draft this report.

Pre-Workshop Visits

The pre-workshop visits were to a variety of organizations both in and around Addis Ababa and in Hawassa about six hour drive from Addis Ababa.

Selam Children's Village

This was really a Hersey School style orphanage that included vocational training programs up to age 18. The vocational training includes limited commercial fabrication of small scale agriculture equipment with the future potential for auto and diesel mechanics. The agricultural equipment they concentrate on includes the IRRI style axial flow threshers obtained from IITA that represents IRRI in Africa. The thresher has been modified to handle other crops, including the very small seeded Teff. In addition to the threshers the school fabricated seed or grain cleaners very much consistent with my concern for "[First Value Added: A clean bag of grain](http://lamar.colostate.edu/~rtinsley/CleanBag.htm)"¹ as well as treadle pumps. Most of the fabrication is done against orders from NGOs working for rural poverty alleviation through various externally supported development projects, with limited

¹ <http://lamar.colostate.edu/~rtinsley/CleanBag.htm>

sales direct to smallholder farmers or agro-dealers service providers supporting smallholder farmers.



Fig. 1. IRRI style axial flow thresher being fabricated at Selam Childrens Village. Note baffles in top to guide cut grains.

grain and straw, along the axial from the small input port on the right side of the table to the discharge end on the left where the straw is thrown free while the grain continuously drops through a grid, where a fan blows most of the chaff away. This forces the straw to make at least four revolutions around the axial while the grain is removed. Thus it can do a much cleaner job of threshing and winnowing that the traditional manual threshing or trampling. The increased cleaner recovery allows for a final clean bag of grain approaching the international standard of >1% foreign material. That could be the main justification of promoting mechanical threshing as often threshing is done in the dry season with little other options for labor, and thus little time constrain for getting it done.

In the Philippines contract mechanical threshing has become widely accepted for many years and paid for with a percent of the crop, typically 5% for the machine and operator, but excluding supporting laborers for cutting and haul the grain to the threshing area. This was actually a modification of the more traditional 20% of the crop for manual cutting and threshing. While I have only seen the percent of crop payment in the Philippines, the concept might be worth encouraging for farmers and service providers in Ethiopia and other parts of Africa for post-harvest contract mechanical threshing. The more complete and cleaner recovery should result in this being viewed as no cost to the farmer compared hand whacking (Fig. 3) or trampling (Fig. 4). Also with the in-kind payment the vested interest of the thresher operators shifts from doing it as quickly as possible and moving on to the next client, to being more careful to get a complete recovery, as they will share in the additional recovery.

Axial Flow Threshers: The axial flow thresher was developed by IRRI's engineering department some 30 years ago. They may represent the most widely accepted output of IRRI's engineering effort for mechanizing smallholder rice production (Fig. 1 & 2). It can substantially reduce the time to thresh a field of rice or other grains, enhance the grain recovery by 10 to 15%, and reduce the chaff that needs to be winnowed. The key design feature are the baffles in the cover that guides the



Fig. 2. IRRI axial flow thresher in use in the Philippines. IRRI file photo.



Fig. 3. Manual threshing rice by whacking the straw in a “whacking box” can still leave substantial grain behind for gleaners to recover in Ghana

You will also find with good mechanical threshing, the gleaners that typically come in after manual threshing to clean up the remaining grains will quietly disappear as what little is left is not worth their effort (Fig. 5)

The use of mechanical threshing or even combining is an activity is conducive to the concept of service providers or support service



Fig. 5 Women Gleaning Remaining Rice After Manual Threshing with Whacking Box, Ghana.

community based family enterprises have always contributed to supporting smallholder agriculturists.

While the axial flow thresher is a good versatile thresher other threshers could also be considered. In Egypt the most commonly used thresher is the “Turkish” thresher (Fig. 6). It is used for both rice and wheat. Previously wheat was threshed with a hammer mill that also chopped straw the straw, which was in high demand as a summer fodder. This then required

Animal trampling, as appears commonly done in Ethiopia, is particularly difficult to get full recovery and acceptable quality as the trampling has to be done on hard ground allowing the animals to push substantial grain into the soil as well as contaminate it with urine or feces. To attempt to trample thresh on any kind of mat, other than a hard concrete floor, that would reduce some of these losses will result in the

animal hoofs quickly cutting through the mat and destroying it.



Fig. 4. Threshing grain by cattle trampling is common practice in Ethiopia but could substantially reduce the recovery and quality of recovered grain.

providers as envisioned in the discussion on [Smallholder Communities – A Symbiotic Association](#). The machinery for mechanical threshing or combining is really too expensive with insufficient annual operating time for individual smallholders to justify the expenses. Thus the need for this to be handled on contract by services providers. It reflects the role of



Fig. 6. Turkish thresher now widely used in Egypt for multiple crops.

providers migrating through an extended harvesting area comprising several villages or communities and dealing with several crops, as the threshing service providers we expected to interview were attempting in the lakes region. The axial flow thresher may be more conducive for more limited village operations.

extensive mechanical winnowing (Fig 7). Rice was threshed by trampling by tractors with a limited amount of the rice straw baled for paper pulp. The Turkish thresher typically is powered by the PTO or belts from 65 hp tractors. It has a higher capacity than the axial flow thresher and might be more conducive to threshing service



Fig 7. Mechanically winnowing Wheat After Hammer Milled Threshing that Chopped the straw for summer fodder in Egypt early 1980s now Replaced By the Turkish Thresher shown in Fig 6.

Grain Cleaners: I am not as familiar with grain cleaners as I am with threshers, but I very much appreciate the contribution they can make. They could be essential in assisting farmers get up to 10% premium sale price, or avoid a price discount. This was clearly pointed out by a food processor in Kano, Nigeria who outright mentioned that when he buys grain in the open market he discounts the value by 15%, in anticipation of both the volume of foreign² material and cost of removing it. While the grain cleaner by Selam Village is motorized (Fig. 8), mechanical winnowers are often manual as it can be difficult to gear down the blowers on power machine enough to prevent the seed from being blown out with the chaff, a particular problem for the very small grain teff (Fig. 9). The problem is with the manual winnowing either with winnow baskets or simply tossing threshed straw and grain in the air, it is impossible to reach the >1% foreign material standard. When this is not met the traders or processors have no choice but to discount the grain to cover the volume of foreign material contained in a sack and the costs of removing it. When communal drying floors are used as is often the case with rice, manual winnowing often does little more than move the chaff from one pile to the downwind neighbors to be rewinnowed again and again until finally exiting the



Fig. 8. Grain cleaner being fabricated by Selam Children's village. Requires a small petro engine.

² <http://lamar.colostate.edu/~rtinsley/CleanBag.htm>



Fig. 9. Manual mechanical winnower used in Ghana for rice.

well as the vested interest in higher quality clean grain sufficient to command a premium (non-discounted) price. Then as farmers bring bags of grain for sale, they can run the grain through the cleaner and command the price differential for a clean bag. This would be even more useful if the farmers' [financial management strategy](#)³ is to retain their crops at their homes and only marketing small quantities at a time to meet immediate cash needs. This spreads the buying



Fig. 11. Village Buying Area for Rice and Best Point in Value Chain for Grain/Seed Cleaners, Nigeria

which has to be paid for by the farmers as a discount in the value received for their marketed grain, and this is a perfectly legitimate discount. In cleaning grain for final sale several processes might be involved. Often rice milling is preceded by a de-stoning process (Fig 12) that will remove most of the stones and mud clogs, but will also remove substantial amount of good grain,

downwind end of the floor (Fig 10). This makes it virtually impossible to meet traders' standards for clean grain.

The question is where in the value chain mechanical grain cleaning should be inserted. The suggestion would be at the village wholesaler who is purchasing grain from the farmer (Fig 11) and arranging to move it up the value chain to the next link, such as parboiling and milling for rice. They have the volume requirements to justify the cost of the cleaners as



Fig. 10. Communal rice drying and winnowing floor in Ghana where it will be nearly impossible and impractical time wise to winnow grain to acceptable standards.

season, but spreads the demand on a mechanical winnowing to a reasonable amount for the casual labor available to dealers to easily assist. This holding in-kind seems to be the case in Ethiopia as maize marketing to the cooperative in Hawassa was spread over some five months.

When farmers fail to provide a clean bag of grain, someone higher up the value chain has to undertake some extensive cleaning. The cost of

³ <http://lamar.colostate.edu/~rtinsley/FinancialStrategy.htm>

perhaps as much as 5%. In other cases a processor will run the grain over a cleaning tray as



Fig. 12. Destoner In Front of Rice Mill to Remove Stones and Mud Clods Prior to Milling.

happens in Kenya for sunflowers prior to extruding the oil (Fig 13). The cleaning tray was designed by an FtF volunteer. Or even simply manually remove the broken gains and foreign material as is done for groundnuts at the Nairobi wholesale market (Fig. 14). In Addis Ababa women will buy sieves to help clean grain at home (Fig. 15).



Fig. 13. A Cleaning Screen Designed by FtF Volunteer(at back) for Sunflowers prior to Extruding Oil in Kenya.



Fig 14. Women Manually Sorting Groundnuts in Nairobi, Kenya Wholesale Market. A Tedious Minimum Paying Job.

Treadle Pumps: The other equipment being fabricated at Selam is the treadle pump (Fig 16). While this may be highly promoted by the Development and NGO communities with some origins at [International Development Enterprises \(IDE\)](http://www.ideorg.org/)⁴ near my base in Colorado, I seriously

doubt if it is appreciated by the farmers, and will wager that one will rarely see them being used in the field except by appointment with the sponsoring NGO interested in promoting the treadle pump for your benefit as a visiting member of the development community. The problem is they are a tremendous calorie consumer, most likely exceeding 300 kcal/hr. and, as



Fig. 15. Women in Addis Ababa Buying Sieves to Clean Grain at Home.

⁴ <http://www.ideorg.org/>



Fig. 16. Treadle pump being demonstrated in Zambia

was hopefully clearly shown in the workshop, calories maybe in short supply. My first FtF assignment was with the [Winrock/IDE⁵](#) project in Zambia that, at the time, was completely committed to promoting treadle pumps. The interesting feature of the assignment was that, while thousands of treadle pumps had been manufactures for IDE and [Kickstart⁶](#), another NGO who, at the time, was focused exclusively on treadle pumps, there were very few open market sales of treadle pumps to dealers or farmers. If the treadle pumps were a fully appreciated technology, farmers would be demanding their availability on the open market. Instead when farmers committed their own finances they purchased small highly portable 5 hp petrol pumps (Fig.



Fig. 17 Small petrol pump farmers tend to purchase in Zambia when using own finances.

17). Much less drudgery and commanded at least twice the area, both by doubling the lift and water delivered. Even in Ethiopia in small dry season vegetable production areas in the bend of a perennial stream, which should be the ideal setting for the treadle pumps, they could only command the very lowest fields, and the operators had a pump and pipe leading



Fig. 18. Small dry season vegetable area north of Addis Ababa that should be ideal for treadle pump, but would only command lowest field to the left. Note pipe running for river to higher fields for mechanical pump.

from the stream to the highest field (Fig.18).

The biggest concern with evaluating the contribution of Selam Village to smallholder development and post-harvest handling is to separate the extent they are serving the NGO community and relying on the NGOs to distribute their machines as part of development projects, from the cash sales directly to dealers or farmers. While the NGO work is important and can facilitate the acceptance of the equipment, it is the open market sales that really determine how well

⁵ <http://lamar.colostate.edu/~rtinsley/SMC-RLT-Report.pdf>

⁶ <http://www.kickstart.org/>

the machinery is accepted and appreciated at the farm or community level. Thus, Selam Village, perhaps with the assistance of SASAKAWA and SAFE, should monitor and report the amount of sales or production going in either channel.

Seka Company (Flour Mill)

This was a bust. When we visited the office in Addis Ababa the manager was tied up and we could not meet him. However, the actual mill was in Hawassa so we were able to visit it two days later when in Hawassa. The visit was disturbing as the mill appears to have been abandoned for over two years. All the equipment was there to do a small scale commercial milling at about 3 t/hr. for any of several grains. All the equipment was covered with dust and debris so that it would take a couple months of cleaning and checking to bring it back in operation and it may not be possible, depending on the degree of rust and corrosion on the moving part, belts etc. One interesting feature of the site was the truck weighing bridge that would weigh an inbound and outbound truck to determine the load by difference. These are used almost exclusively for bulk handling of grain and are really out of place in a country that bag handles all grain. It indicates the mill most likely was installed as part of some externally funded development project expecting Ethiopia to start bulk handling grain.

Debre Libanos Milk Processing

The milk processing program was a very small effort at women income generation enterprise for “financial empowerment”⁷. The enterprise was to purchase, rather than obtain from their own cows, up to 160 lit of fresh milk, scald it for pasteurization (Fig. 19), manually separate the cream (Fig. 20), and manually churn the cream to butter and skim milk into some form of local cottage cheese (Fig. 21). The 160 lit of milk at 4% butterfat, if fully recovered, would yield 6.4

lit of butter fat and perhaps 8 kg of butter a day. However, with the manual operation and variable centrifuge speeds the more typical recovery would be in the order of 70%⁸ for an estimated recovery of 4.5 lit of butter fat and only 6 kg of butter from the 160 lit of whole milk. At 140 Birr/kg the gross income from 6 kg of butter would only be 840 Birr which divided among the



Fig. 19. Scalding Milk on Open Fire for Pasteurization.

⁷ *The word empowerment is questionable in this context as empowerment usually implies a political interest, but here, as in other development projects, it is strictly referring to financial advantage with no political impact. It might be desirable to seek another more appropriate and accurate term.*

⁸ <http://www.ilri.cgiar.org/InfoServ/Webpub/fulldocs/Bulletin22/Traditional.htm>

six women involved would provide a gross income of 148 Birr before deducting for cost of milk and other expenses.



Fig. 20. Manually Operated Centrifuge for Separating Butter Fat from Milk

While the enterprise may be social desirable it does not appear well conceived as a viable competitive business model and will most likely collapse once any external assistance ends. It looks similar to another women income generation “financial empowerment” in Kenya based on making soybean milk and “soybean meat” as part



Fig. 21. Heating Skim Milk for Converting to Local Cheese.

of an effort to develop local consumption of soybeans and soybean products (Fig. 22) and an overall effort to promote soybean production as legume crop in Kenya⁹. While the social desirable of women income generation enterprises is fully appreciated, it might be worthwhile



Fig. 22. Similar Income Generation Empowerment Project in Kenya for Soybeans. Same Low Prospects for Sustainability.

for those designing such projects to become more familiar with competitive viable business models to assure the projects have a greater potential for sustainability beyond any initial donor assistance. This might include an estimate of minimum volume needed to for a financially viable enterprise, the need for more mechanized operation to assure better quality control, and administrative overhead costs associated with a group enterprise. As is it is unlikely the enterprise is truly profitable and any profit is more likely associated with creative accounting than viable sustainable business enterprise. This could be done by not paying the women an established

wage, but simply distributing the “profits” to them. In this case the true evaluation would need to deduct from the “profit” sharing the opportunity costs of hiring out as a casual laborer for a day which should be around 70 Birr/day (\$3.70).

⁹ <http://amar.colostate.edu/~rtinsley/SoybeanKenya.pdf>

While it is unlikely the enterprise will be sustainable the prospects could be enhanced by moving the entire operation out to the main highway, some 2 km away, as planned for the marketing component. This would allow those processing the milk to also participate in the sale of the butter and cheese, instead of having this as an independent activity. By so doing the overhead costs could be reduced increasing the prospects for profit. However, the small shop building built for this may need to be extensively renovated to increase the convection driven cross ventilation (Fig. 23). This would imply installing exit louvers at the top and back of the slanted ceiling so hot air generated by the sun beating on the roof and flowing along the ceiling can easily escape, plus inlet louvers at the bottom front of the opposite wall to encourage cooler air to enter. This should provide a modest convection flow and keep the fully exposed building relatively cool. Such cooling not only will make the building more comfortable for the staff, but could also relieve some pressure on the refrigeration requirement, lowering operational costs and increasing potential profits.



Fig. 23. Shop Being Prepared for Butter Sales, but Needing Improve Convection Circulation to Reduce Overheating.

Another area where it might be possible to enhance the prospects of the enterprise would be in the packaging. As it is the packaging is simply putting both the butter and cheese into plastic bags and placing them in a fairly unreliable refrigerator and hoping the power will be stable enough so the butter and cheese don't spoil (Fig. 24). The need is to get the butter and cheese in some form of standard attractive shape. This could be a simple mold or perhaps a cheap plastic container commonly used for take-out foods. This would enhance the appearance and make it easy to glue a label to the top. As it is I would not be attempted to purchase the butter as just too unattractive. This does open the question with the limited and unreliable refrigerated storage and limited sales, how often the women are engage in processing milk. Perhaps it is only when someone from SASAKAWA makes an appointment to bring a visitor.



Fig. 24. Butter Packed in Plastic Bags in Freezer Compartment of Refrigerator.

Finally, the enterprise could be enhanced by looking at small scale power equipment for separating cream and churning butter. This would allow a higher volume to be processed and if all sold provide a more reasonable income. It might also improve the quality as with hand operations there will be varying speeds on the centrifuge resulting in variation in the degree of butterfat recovered and skim milk remaining. This could increase the quality and competitiveness of the enterprise.

Ultimately, this looks more like an enterprise for and individual family service provider business with the possibility of hiring some outside help than an organization managed enterprise. It could easily be women managed which is typical of many small family enterprises in Ethiopia and elsewhere in Africa, with additional women as employees. Those promoting organizational enterprises should take a closer look at the history of such organizations over the past couple decades and see how many survive beyond donor facilitation, as they tend to get caught up in the cumbersome administrative overhead and participatory decision making with the prospects of conflict between member, ultimately leading to the demise of the enterprise as seems to occur all too often with group enterprises.

Sidama Elto Cooperative Union

The Sidama Elto Cooperative was a large grain cooperative conglomerate based in Hawassa. This was mostly dealing in maize but did support other grains. The cooperative has some 71 primary cooperatives and 13,099 individual members for an average of 184 members per cooperative. This seems like a large number of members that it would be difficult to envision a high degree of direct participation by members in the overall decision making of the organization as envisioned by the cooperative promoters, and most of the operations will be determined by hired managers. This leaves open the question in Ethiopia how much of farmer cooperative membership has been mandated by the government resulting in large number of members on the books, but with a high percent inactive members or members side-selling the bulk of their production to private dealers contrary to established by-laws.

Most of the maize Sidama Elto was processing was going to the World Food Program (WFP) as part of various reliefs or other distribution program including school lunches. As such the cooperative was operating outside the main commercial grain value chain from farmer to consumer. This is something of concern as it may indicate the cooperative may struggle to compete in the main value chain. It was also noted that the 13,099 members were expected to manage about 0.5 ha each for a total aggregate land of 6500 ha. With an expected production 5 mt/ha they should have 16,250 tons of grain to market. However, the cooperative only had orders for about 4,500 ton or roughly 1/4th the cooperative members' production. Thus approximately 3/4th of farmers production was side sold. Annual overhead costs were listed as 500,000 Birr. They did pay annual dividends and managed some maize shelling and grain cleaning activities.

During the interview visit to the second warehouse, they were manually off-loading 100 kg bags maize (Fig. 25), and then rebagging it smaller 25 kg bags (Fig. 26) after a quick sieving to remove some of the maize hulls bring the foreign material down to > 6% (Fig 27). It was not certain how the buying was done, as the cooperative headquarters provided buying floats to the primary cooperatives, for quick cash payment but I still got the impression of some delay in payment. It was mention purchases were spread over 5 to 7 months. This would be consistent with the basic hoarding first noticed in Malawi that extends the



Fig. 25. Off-loading 100 kg bags of Maize at Sidama Elto Cooperative.



Fig. 26. Maize Rebagged In 25 kg Bags for World Food Program and UK Aid

purchasing season and overhead costs of the cooperative, but is consistent with a possible overall financial management strategy mentioned earlier.



Fig. 27. Giving Maize a Quick Sieving to remove maize hulls and reduce Foreign Material of 6%.

Value Chain Workshop

The workshop lasted for four days, which was normal for a workshop training program. There were 24 full time participants representing all seven participating universities (Fig. 28). In addition there were some part time participants from the host university as their schedules would allow. It was divided into several presentation, some exercises, and discussions. All the material presented or referenced was accumulated and distributed to the participants as PowerPoint presentations or PDF files on a DVD along with all photos from the pre-workshop field visits after the conclusion of the workshop. Much of the material was derived from the text

“Developing Smallholder Agriculture: A Global Perspective” and website:

www.smallholderagriculture.com.

Topics included:

- Extent of Value Chains in the USA
- Successful value chains
 - Land o’ Lakes
 - Florida Natural
 - Ocean Spray
- Problem value chains
 - Farmland
- Business model associated with value chains,
 - How competitive,
 - Administratively cumbersome
 - Spin reporting
- Enhancing Value Chain – Farm Level
 - Enhancing yield
 - Enhancing yield recovery
 - Enhancing yield quality
- Dietary Energy Balance Exercise
 - Impact of available labor on value chain enhancement opportunities
 - Possible 4.4 hour work day (See box)
- Enhancing value chain – Value added vs. Outsourcing
 - Par-boiling and Milling rice
 - Converting cassava to gari
- Enhancing value chain – Miscellaneous Topics
 - Transportation to & from remote areas
 - High value crops’
 - Tomato marketing in Nepal
- Enhancing value chain – Service Providers & Micro Finance
- Value Chain Curriculum Development Discussion Groups



Fig. 28. Group Photo of Workshop Participants

Critique of Workshop

For the most part the workshop went smooth for an initial presentation. However, typically additional presentations result in considerable refinement, perhaps as much as 20% representing

a combination of elaboration on topics include and topics added. In this case future workshops, if requested, would place more emphasis on the contributions of private service providers and role of modified micro-credit could have in assisting service providers in their efforts at supporting smallholders. In addition it is really a challenge for one resource person to conduct a four day workshop single handed. Thus, while the resource person can handle most of the presentations, the sponsoring organization needs to provide a senior facilitator. This person would be responsible for overseeing all the logistics, plus being a discussion leader for open discussion following the main presentations as well as facilitating the group discussion report backs. Jeff Mutimba did this on one occasion and it substantially improved the discussion results.

Summary

The pre-workshop visits indicated SASAKAWA and SAFE have a major concern with post-harvest handling and an appreciation that this most likely implies contractual access to private mechanical threshing and cleaning service providers who might be best compensated with a share of the crop. This is most appreciated and is a good opportunity for private family enterprise service providers to support small farmers, as has been the case in several countries for many years. However, the women income generation “empowerment” may need considerable review to make certain it will be a viable, competitive and sustainable enterprise that won’t simply collapse at the end of external assistance, as happens to the vast majority of such initiatives. The business model associated with the cooperative might also need extensive review as it appears the cooperative can only command a minority of the members produce, and then operates in a parallel economy rather than part of the primary commercial value chain.

The workshop briefly looked at the limited role value chains, traceable back to farmers, contribute to consumer marketing the USA, with the only names Land o’ Lakes, Florida Natural, and Ocean Spray having while recognized national brand names with Ocean Spray being the only one dominating it commodity, cranberries. Also, the difficulty experienced by Farmland leading to its demise. This lead to a brief discussion about the extent the development effort promotes ideas to developing countries well beyond the role they have in home country economics and value chains. The workshop continued to review the cooperative business model and concern that, despite it being socially desirable, as used in development projects, it may be too administratively cumbersome and too inconvenient to attract wide spread active participation by the intended beneficiaries. Thus while it might be possible to recruit farmers to a cooperative and the government might be leveraging their participation, the farmers may not be relying the cooperatives for the services they presumable offered. This limited farmer participation was then cover-up with some massive spin reporting, emphasizing aggregate values and accounting that ends at the cooperative instead of extending to the farm gate, an analysis that, by default, allocates all the cooperative costs as a direct financial benefit to the farmers.

The workshop then continued to look at how to enhance the value chain for the benefit of the smallholder farmers. This started at the farm level where farmers have the most control. The prospects for enhancing the value chain at the farm level could be accomplished by enhancing yields, yield recovery and yield quality. All of which might require some service providers to provide mechanical services to expedite crop establishment with land preparation, mechanic thresh crops for improved recovery, and mechanical cleaning the grain to meet standards of foreign material and avoid having the value of the grain discounted.

Moving up the value chain the question became at what point the farmer should be actively involved vs. outsourcing the value added. This is a purely economic decision based on cost benefit analysis, recognizing that the further up the value chain the farmer remains involved the greater the return, but also the greater the costs incurred to obtain those returns, and the need to identify the point where the additional costs exceed the return. This also has to be balanced by the opportunity to use the limited available labor to continue to enhance the value at the farm level where the farmer has the greatest control.

Part of this analysis was to look at the calorie energy balance and estimate the hours a person can be expected to diligently work based on the limited calories based on estimate of casual labor wages and consumer prices obtain in Addis Ababa the week before the workshop (Appendix B). One participant with a food science background did an exceptional good assignment that indicated the work day to as little as 4.5 hours (Box 1). In this case it will be extremely difficulty for farmer restricted to manual operations with a hoe, etc. to dig themselves out of poverty. With this limited work day, it will be virtually impossible to manage enough land in a sufficiently timely manner against declining yield potential to assure food security for the smallholder family let alone make major contributions to marketable surplus. Given this limit on available labor the farmers are most likely best off if they concentrate on farm level enhancements, and out-source any off-farm processing like par-boiling and milling rice, converting cassava to gari, removing the parchment layer from coffee beans.

Other topics discussed was a detailed analysis of the value chain for marketing tomatoes in Nepal, and the importance of relying on service providers to provide most support services. Finally the need to look at micro-credit and possible modifying the micro-credit programs to be consistent with the needs at various point in the value chain where a capital infusion is needed either for purchase of equipment with the equipment serving as the collateral, or operational costs so service can be provide to the farmers on credit and paid for at the end of the season.

Box 1. Dietary Energy Balance Analysis

Assumed casual labor wage: 50 birr/day ($50/19 = \text{US\$ } 2.63/\text{day}$)

Compared to US minimum wage of $\text{US\$ } 7.15/\text{hr.} = 7.15 * 8 = \text{US\$ } 57.2/\text{day}$ for ration of $2.63/57.2 = 0.04$ or 1/25 the US minimum wage.

Maximum birr available for food = 80% or 40 birr/day, the rest going for fuel, light other essentials

Family to be feed:

Husband

Wife

Adolescence son

2 younger children

Food purchased

Kinds	Amount in Kg/month	Amount in g/day	Daily price	Given Kcal/100g	Actual Kcal
Beef	2	67	3.33	137	91.79
Wheat	20	667	5.67	334	1867.6
Maize	40	1333	7.33	364	3999
Teff	20	667	9.3	367	2447.89
Sorghum	15	500	3	339	1500
Chickpea	10	330	3.33	364	1201.2
Onion	5	167	0.83	40	66.8
Potato	10	333	2	58	193.14
Coffee	1	33	3	0	0
Sugar	2	67	1	387	259.29
Piper	1	33	0.924	67	22.11
Salt	1	33	0.133	0	0
Veg. oil	1	33	0.73	887	291.12
Total			40.58		11939.94

Daily Allocation and needs

Husband 3,000

Wife 2,800

Adolescence son 2,800

Younger children $1,700 \times 2 = 3,400$

Total calories 12,000 (Within rounding error of the 11,940 purchased)

Hours of labor at 300 kcal/hr.

3000 calories available minus basic metabolism for day of 2000 kcals

$3000 - 2000 = 1000$ allocated to work energy

Net hourly calorie requirement $300 - 80 = 220$. Where the 80 is the portion of basic metabolism included in the 300 Kcal/hour exertion value.

Thus diligent working hour $(3000 - 2000)/220 = 4.5$ hours

A full 8 hour day of diligent agronomic field work will require 4000 kcal diet.

Ethiopia Value Chain Analysis and Training

Appendix A: Daily Activities Log

- 2 March I departed home at 7 am for airport and uneventful trip to Addis Ababa via Detroit and Amsterdam.
- 3 March Arrived Addis Ababa at 8:30 in the evening on time but one hour early according to itinerary provided. Found someone who called Daniel and expedited the driver to the airport, and proceeded to hotel
- 4 March Meet with Daniel for initial briefing at hotel and proceeded to remain at hotel while Daniel worked with another volunteer. Daniel returned later in day and we proceeded to the market to collect consumer price data and take pictures of market. I started completing consumer price table for Ethiopia.
- 5 March I was introduced to Oto Oumer who accompanied me to the Selam Children's Village. This is a Hershey school like children's home providing home, education and vocational training for children up to 18 who have lost their parents. Also, somewhat like Don Basco in other parts of Africa, part of their vocational training program is fabrication of small scale agriculture equipment. This included the IIRI designed axial-flow thresher they acquired from IITA and modified for other crops. They also had grain cleaners, both of which I fully appreciated as well as the good old treadle pump. I suggested they keep track of how much of their machinery is sold to NGOs for distribution as part of development projects and how much goes for commercial sale either directly to farmers or some commercial dealer, and emphasize the latter as better indication of farmers' appreciation of the concept.
- Returned to hotel for lunch and picked up again in afternoon visit to Seka and flour mill. The manager was not available and the mill was actually located out of town so after waiting for the manager we conclude better to just visit the mill during the field visit and left. With extra time finished the consumer price data, acquired some chloroquine for Malaria preventions, exchanged some money and returned to the hotel.
- 6 March Departed hotel at 7:15 for 2 hour trip north to Debre Libanos to visit small women's income generating program converting milk to butter and whey. I was mostly disappointed in the overall concept. It very much reminded me of the soybean to soymilk and "soymeat" projects I reviewed in Kenya. It was on the same scale and same emphasis on manual centrifuging and manual churning. It was also located some 2 km off the tarmac that would be highly inconvenient for customers to come for purchase, although they were planning to shortly open an

outlet store on the main highway at the edge of town. The packaging was simply in plastic bags with no rigid form or labeling. I just do not see this as a viable program that will become sustainable even if the marketing problem is solved. They claim they are processing some 160 liters of purchased milk a day. With a 4% butterfat content that will yield about 7 kgs of butter a day, provided they fully extract the butterfat, which may be difficult with the manual centrifuging and variation in speed that will result. I would guess the resulting butter would be on the lower end of the quality scale, making marketing difficult and perhaps requiring some serious discounting just to dispose of the butter. This projected needed to be more carefully thought through at conception.

After visiting the milk processing proceeded back toward Addis, taking the ring road around the city and preceded to Hawassa in the south. It was a long 6 hour drive. En route stopped and photographed a small irrigated vegetable area adjacent to a rapidly drying stream. This could be the ideal place for treadle pumps, but noted a mechanical pump in use that extended well beyond what a treadle pump could reach.

7 March

Visited the Sidama Elto Cooperative Union. This was mostly a grain cooperative with some 71 primary cooperatives and 13,099 individual members. Not sure with this number how and individual smallholder gets much input into the operation. They did deal with a variety of grains but were mostly marketing through the WFP and not the main economy. Thus part of what I have referred to as a parallel economy, a public sector or quasi-public sector commanding a relatively small market share but a lot of development attention, and fully private sector that handled the bulk of the produce without any external support. In this case the farmers were expected to manage about 0.5 ha each for a total aggregate land of 6500 ha. With an expected production 5 mt/ha they should have 16,250 tons of produce to market. However, they cooperative only had orders for about 4,500 ton or roughly 1/4th the cooperative production. Thus approximately 3/4th was side sold. Overhead costs were listed as 500,000 brr. They did pay annual dividends and managed some maize shelling and grain cleaning activities. Not really certain how the buying was done, as the cooperative headquarters provided buying floats to the primary cooperatives, but still get the impression of some delay in payment. It was mention purchases were spread over 5 to 7 months.

Next visit was to Hawassa University and College of Environment and Development for a good discussion on SAFE's activities and upcoming training program for which the University was sending three participants.

Next was a visit to the Seka flour mill that we missed on Monday. This was disturbing as the mill had not be run for a couple years and was all covered with

dust etc. It would take several months of hard work to bring it back into service if at all as the machinery could have completely rusted out etc. Similar to the abandoned mill in Nigeria but at least not exposed to the elements. Interesting to note the truck weighing bridge designed for bulk handling. It would be out of place in a country using mostly bagged grain, and makes me think the mill was established under some form of development project.

The final visit was with some service providers involved in threshing, possible with the IRRI axial flow unit we saw at Selam Children village. However, the interview quickly deteriorated into a rampage concerning some unpaid debts and thus no possible to get any information. Thus had a cup of tea and proceed back toward Addis Ababa arriving about 6 in the evening.

- 8 March Day in Addis with only a briefing for Jeff Mutimba and Leony Halos-Kim of SASAKAWA Africa Association. Then rest of the day off at hotel
- 9 March Saturday and day off to work on workshop material.
- 10 March Sunday but 6 hour road trip to Jimma where the workshop will be held checked into the Central Jimma Hotel
- 11 March Served as resource person for workshop. Today had opening formalities, introduction on value chain, and cooperative business model within the value chain. Concluded with breakout sessions on spin reporting in cooperatives
- 12 March Continued workshop with report back on cooperative spin reporting. Started discussion on enhancing value chain at farm level, help breakout session on dietary energy balance. Consumed all afternoon
- 13 March Report back on dietary energy balance and proceeded with open discussion and more discussion on enhancing value chain. Including topics on transportation, details for value chain for tomatoes in Nepal, and high valued crops.
- 14 March Final briefing on “service providers” and micro-finance, instruction for final group sessions, group discussion, and report outs. Ended workshop. Had participants dinner at hotel in evening.
- 15 March Returned to Addis Ababa and got settled into hotel for remainder of time. It was 6 hour drive.
- 16 March Mostly remained around the hotel wrapping up the workshop and taking it easy, catching up on blogging, but did enjoy a nice dinner with the group at a Culture Restaurant featuring traditional Ethiopian food accompanied by some song and dance.

- 17 March Sunday and spent the day around the hotel working on workshop wrap-up and other things.
- 18 March Had debriefing with Leoni at SASKAWA on the workshop and what needs to be done. Returned to hotel to continue preparing DVD of all workshop materials
- 19 March Finished material for DVD and proceed to draft assignment report.
- 20 March Continued working from hotel on technical report. Daniel came for an update and brought the DVDs. Burned DVDs for all participants and finally join Scott Monroe a fellow volunteer for a cultural dinner.
- 21 March Continued working on technical report took some time for souvenir shopping and again meet with Daniel to review final preparation for departure to US. Arranged to temporary occupy Scott's room from the mandatory check-out time until departure in the evening.
- 22 March Packed-up, shifted rooms, a little tourist visit, and departure for Fort Collins on time at 11:30 PM.
- 23 March All day travelled from Addis Ababa to Amsterdam, to Detroit to Denver and Fort Collins. Included a 4 hour hold in Detroit waiting for arrival slot in Denver due to snow storm reducing traffic at airport. Arrived home at midnight.

End Of Activities Log

Appendix B – Consumer Prices

Comparative Consumer Prices (Ethiopia vs. USA)

Commodity	Ethiopia Price (Birr)		US Price		Adjusted to US\$ & Common Unit			Comparison Ratio	Kcal/100 g or ml
	Price	Unit	Price	Unit	Ethiopia	US	Unit		
								Eth/US	
Dry Goods									
Flour	14.00	kg	0.40	lbs	0.77	0.88	Kg	0.87	361
Sugar	111.00	2 kg	0.60	lbs	3.03	1.32	Kg	2.30	387
Salt	22.50	737 gm	0.62	lbs	1.67	1.36	Kg	1.22	0
Coffee	72.00	0.5 kg	4.16	lbs	7.87	9.15	Kg	0.86	0
Tea	7.20	100 g	28.00	lbs	3.93	61.60	Kg	0.06	1
Pasta	17.00	kg	1.65	lbs	0.93	3.63	Kg	0.26	357
Veg.Oil	61.00	lit	1.80	qt	3.33	1.69	lit	1.97	884
Grains									
Wheat	15.00	kg	1.39	lbs	0.82	3.06	Kg	0.27	
Barley	15.50	kg	1.49	lbs	0.85	3.28	Kg	0.26	
Maize Grain	7.50	kg	1.99	lbs	0.41	4.38	Kg	0.09	
Teff	22.00	kg	4.92	lbs	1.20	10.82	Kg	0.11	367
Sorghum	10.00	kg	1.79	lbs	0.55	3.94	Kg	0.14	
Sunflower	12.00	kg	2.99	lbs	0.66	6.58	Kg	0.10	
Chick Pea	32.00	kg	1.89	lbs	1.75	4.16	Kg	0.42	364
Lentil Split	32.00	kg	1.89	lbs	1.75	4.16	Kg	0.42	353
Broad Bean	18.00	kg	0.99	lbs	0.98	2.18	Kg	0.45	341
Rice	15.00	kg	0.60	lbs	0.82	1.32	Kg	0.62	365
Groundnuts	25.00	kg	4.99	lbs	1.37	10.98	Kg	0.12	567
Dairy									
Eggs	3.00	ea	0.12	ea	0.16	0.12	ea	1.37	143
Milk	18.00	lit	2.79	gal	0.98	0.74	lit	1.33	61
Milk (UHT)	53.30	lit	2.79	gal	2.91	0.74	lit	3.95	61
Butter	140.00	kg	2.50	lbs	7.65	5.50	Kg	1.39	717
Yogurt	8.40	250 ml	1.99	qt	1.84	1.87	lit	0.98	61
Meat									
Beef	188.90	kg	4.99	lbs	10.32	10.98	Kg	0.94	137
Chicken	126.00	kg	0.98	lbs	6.89	2.16	Kg	3.19	111
Pork	202.80		3.49	lbs	11.08				132
Goat/Lamb	129.90	kg	5.49	lbs	7.10				109
Fish	256.80	kg	4.99	lbs	14.03	10.98	Kg	1.28	96
Canned Fish	56.20	425g	4.16	lbs	7.23	9.15	Kg	0.79	138
Vegetables									
Tomatoes	10.00	kg	1.19	lbs	0.55	2.62	Kg	0.21	18
Carrots	10.00	kg	0.79	lbs	0.55	1.74	Kg	0.31	88
Kale	10.00	kg	2.00	lbs	0.55	4.40	Kg	0.12	49
Beans	5.00	kg	1.99	lbs	0.27	4.38	Kg	0.06	31
Onions	5.00	kg	0.88	lbs	0.27	1.94	Kg	0.14	40
Garlic	20.00		2.99	lbs	1.09	6.58	Kg	0.17	149
Potatoes	10.00	kg	0.34	lbs	0.55	0.75	Kg	0.73	58
Cabbage	7.00	kg	0.59	lbs	0.38	1.30	Kg	0.29	25
Fruits									
Bananas	12.00	kg	0.56	lbs	0.66	1.23	Kg	0.53	89
Avocado	15.00	kg	4.70	lbs	0.82	10.34	Kg	0.08	160
Papaya	15.00	kg	2.00	lbs	0.82	4.40	Kg	0.19	43
Lemons	20.00	kg	1.99	lbs	1.09	4.38	Kg	0.25	29
Pineapples	20.00	kg	0.66	lbs	1.09	1.45	Kg	0.75	50
Mango	43.00	kg	1.76	lbs	2.35	3.87	Kg	0.61	60
Oranges	25.00	kg	0.99	lbs	1.37	2.18	Kg	0.63	49
Other									
Gas	20.00	lit	3.45	gal	1.09	0.91	lit	1.20	
Diesel	18.00	lit	3.85	gal	0.98	1.02	lit	0.97	

Exchange rate US\$ = 18.33 Birr Date: March 2013