

Nepal Australia Friendship Association (NAFA)
Implementation of first English Family Foundation grant to re-establish Pasang Chowk Agricultural Cooperative
Final Report 21 December 2017

Funds allocated to the Pasang Chowk Agricultural Cooperative via the Hilly Region Development Club (HRDC) – April 2016

Visits to Tawal: 1st visit 6-14 Nov 2016 2nd visit 25–29 Nov 2016 3rd visit 22-27 Feb 2017 4th visit 3-10 Nov 2017 5th visit 19-25 Nov 2017

NAFA (4th visit in November 2017): Rod and Deborah Setterlund, Rick Parkes, Khilraj Pandeya

English Family Foundation (5-7 November 2017): Allan English and Michael de Gruyter

Joy Foundation Nepal (4th visit in November 2017): Pratika Shakya (translator)

Activities Outcomes sought (in bold font)	Key performance indicators Short term - within 12 months Longer term - > 12 months (in bold font)	Progress on implementation as at 1 December 2016 Updated after February 2017 visit Updated after November 2017 visits
<p>1. Provide caretaker salary for 12 months for re-establishment of Cooperative after earthquake</p> <p>Protection and care of Coop assets, including broiler and egg-laying chickens</p>	<p>12 months salary paid to caretaker</p> <p>Evidence that chickens have been cared for and protected e.g. numbers of chickens maintained after 12 months.</p>	<ul style="list-style-type: none"> • Chirring Tamang started work on 1 November 2016 following completion of the Cooperative infrastructure rebuild (funded by NAFA) and is on probation for 3 months. • Chickens will be purchased as soon as the road to Duchene (close to the land owned by the Cooperative opens and trucks start arriving regularly from the district HQs, Dhading Besi). <p>February 2017 update</p> <ul style="list-style-type: none"> • Previous, more experienced caretaker (Som Ram Tamang) couldn't continue at the Co-op after the earthquake due to his wife's health. <p>November 2017 update</p> <ul style="list-style-type: none"> • Som Ram Tamang has returned as caretaker at Cooperative after problems were experienced with the chickens (see further explanation below). 12 month salary support now over. Salary for caretaker is 12,000 Nrs per month (\$160 per month = \$1,920 p.a.) • Allan and Mike raised the suggestion (which Kanchha thought was a good idea) of having a salary + bonus based on the net profit from sale of broiler chickens. Allan suggested that bonus should be up to 20-30% of base salary. • Followed up in second visit to Tawal 10 days later. Kanchha has spoken to the caretaker who not surprisingly likes this idea. Idea will go to a full meeting of the Cooperative after the national/state election on 26 November.
<p>2. Cardamom growing training on-site</p> <p>Increased skills & knowledge to grow cardamom in the Tawal area.</p> <p>Establishment of new high value spice crop in the Tawal area</p>	<p>Evidence of cardamom growing training program completed</p>	<ul style="list-style-type: none"> • 2 day training undertaken by Chho Lama, government accredited training on 3-4 June 2016. • 81 farmers from five villages attended and reported positive feedback on the training. The training included both theory and practical aspects. Farmers learned about where to plant, how to water (into the roots rather than sprayed over the leaves) and how to control diseases. Chho Lama also provided expertise about where to purchase the plants as he knows the areas which are currently disease-free.

<p>3. Follow up training on site for cardamom growing</p> <p>Early stage monitoring to ensure successful introduction of cardamom plants into the area</p>	<p>Evidence of success in growing of cardamom by local farmers e.g. available data on cardamom grown and/or sold, cash income received.</p> <p>Longer term: Farmers confirmed it takes 3 years for cardamom plants to produce saleable seed product</p>	<p>November 2017 update</p> <ul style="list-style-type: none"> The model being used for follow-up training is for the trainer (Chho Lama and Balsing Tamang, who both live in the area and are highly respected farmers) to provide support to individual farmers experiencing difficulties or needing one to one advice on their crops after they have been planted.
<p>4. Purchase 20,000 cardamom plants</p> <p>Procurement and transport of 20,000 cardamom plants to members of the Pasang Chowk Agricultural Co-op.</p>	<p>Evidence e.g. invoice of cardamom plants purchased and record of allocation of plants to members of the Co-op.</p>	<ul style="list-style-type: none"> 20,000 cardamom plants (used as a spice and as a natural medicine) purchased and farmers purchased an additional 25,000 plants with their own funds. Two types of plants distributed from Kavre (south of Kathmandu valley) and Ilam districts (eastern Nepal). Close up photo of one of Balsing's cardamom plants. Co-op members advised that it will take three years for the cardamom crops to produce saleable product – and then the produce will increase each year if the plants are healthy. The Co-op will buy the cardamom from the farmers when it is ready to sell and coordinate to get the highest price possible at the time of sale, either selling to agent who will arrange to pick up the product at the end of the road-head or the Co-op will sell the product in Kathmandu. The selling season is usually the end of the monsoon season (August/September). <p>February 2017 update</p> <ul style="list-style-type: none"> Plants showing stress from not having water since end of monsoon season. Govt has had 50% contribution from the Co-op (funded by NAFA) for two months but still haven't provided the irrigation pipes (as at 20 March 2017). Balsing estimates that between 10%-20% of the estimated 45,000 plants (20,000 purchased with EFF funds and 25,000 self-funded by members of the Co-op) have died due to lack of water and shade. <p>November 2017 update</p> <ul style="list-style-type: none"> Cardamom plants sighted appear healthy with some plants now producing cardamom pods. 76 households have planted cardamom (Coop records). Average of 300 plants per household. Tawal 31 HHs Ladap 26 HHs Duchene 19 HHs. The government has a guide for coffee and cardamom prices to the farmer but the price will vary depending on overall global conditions. Kanchha said in our second visit that the price for cardamom has dropped this year to 1,200 Nrs (\$15) per kg compared to 2,000 Nrs (\$26) per kg last year. It is affected by supply and demand global factors. As the crop is still new in Tawal, Kanchha says that families are only producing 2-3 kgs of cardamom per year but this will increase as the plants mature. Balsing indicated that each farmer has planted an average of 500 plants which should produce approximately 200 kgs of cardamom (total value of 2.5 - 4 lakhs (\$3,500 - \$5,200 per year), depending on the global price for cardamom, when the plants are fully producing. This would provide a significant boost to the local economy which currently relies on the sale of cane baskets (approximately 3 a day at \$1.25 per basket taking into account collecting cane, cutting and soaking it) as the main only product outside the area.

<p>5. Coffee growing training</p> <p>Increased capacity & knowledge to grow coffee in the Tawal area.</p> <p>Expansion of the fledgling coffee industry in the area</p>	<p>Evidence of coffee growing training completed</p>	<ul style="list-style-type: none"> • Training conducted by Chho Lama 5-6 June 2016. Chho provided written material on his training program. Feedback of those Co-op members present at the meeting was positive about the training. Chho is originally from the area. He is also an expert on grasses (special grass important for “developed” goats), crops such as oranges and lemons and trees for reforestation. He has offered to help the Co-op to prepare a proposal to establish a nursery on the land owned by the Co-op and he said he would also volunteer his time to help establish the nursery. • Balsing Tamang indicated that he learned some new things from the trainer, especially about organic composting and the importance of shade to keeping healthy coffee plants. Balsing has grown coffee in the area for a few years now. He has a small nursery and supplies local farmers with coffee seedlings/plants. Balsing roasts a little of his coffee locally using a pressure cooker/clay bowl. We drank some during our visit and it has improved from other years. • Farmers learned that they would attract much higher prices for their coffee if the coffee could be grown organically, although accreditation is a complex and possibly costly process. • Four villages in the area (Tawal, Tawal Besi, Kutal and Duchene) are considered to be at the right altitude for coffee growing. Balsing reported that 25 farmers in the area are growing coffee, with 12 farmers (all from the village of Duchene which is the village nearest the land owned by the Cooperative) selling their coffee beans to the outside market. • We suggested that in the longer term they should try and band together with other farmers in the district to produce “Ganesh Himal Coffee”. <p>November 2017 update</p> <ul style="list-style-type: none"> • Balsing estimates that 900 kgs of coffee sold from area in past 12 months from farmers with established coffee plants. This quantity will increase as EFF and newly private funded plants mature in the next few years. Kanchha says the “inner coffee bean” is currently selling for 400 Nrs (\$5.70) per kg. • Further discussion of the branding of products from the Cooperative after Allan and Mike emphasized the importance of this. • Suggested name by the new Women’s Social Mobiliser is supported by Kanchha and other Coop leaders: <i>“Mindó Maya Crafts (or Coffee or Cardamom etc) From the Hilly Region of Nepal”</i> • Logo is the same as the Cooperative = 2 hills and trees. • Logo (black and white to save printing costs) has been designed, Facebook page and email address set up by Uttam Shrestha , who is an IT consultant, who has long supported NAFA in different ways.
<p>6. Follow up training on site for coffee growing</p> <p>Early stage monitoring to ensure successful expansion of the coffee industry in the area</p>	<p>Evidence of success in growing of coffee by local farmers e.g. available data on coffee grown and/or cash income received</p> <p>Longer term: It takes 2-3 years for coffee plants to produce saleable “inner” coffee beans.</p>	<p>November 2017 update</p> <ul style="list-style-type: none"> • The model being used for follow-up training is for the trainer (Chho Lama and Balsing Tamang, who both live in the area and are highly respected farmers) to provide support to individual farmers experiencing difficulties or needing one to one advice on their crops after they have been planted

<p>7. Purchase of coffee pulping machine</p> <p>Initial processing of coffee beans grown in area, adding cash value to coffee income for farmers</p>	<p>Evidence of coffee pulping machine purchased and being used by local farmers</p>	<ul style="list-style-type: none"> Will be purchased when the rough road that ends in Duchene (close to the Cooperative owned land) opens after the monsoon season (hopefully early December). <p>November 2017 update</p> <ul style="list-style-type: none"> Pulping machine has been purchased (see photo) Balsing would like Cooperative to purchase a basic coffee roaster. Allan said this would be too high an investment for the quantity of coffee beans currently being harvested.
<p>8. Purchase of solar panels, batteries, invertors for electricity for warming two chicken rearing sheds.</p> <p>Warmth in chicken rearing sheds through solar lighting, needed in the raising of chickens.</p>	<p>Evidence of solar panels and inverters being installed in the Coop chicken rearing sheds</p>	<ul style="list-style-type: none"> Will be purchased when the rough road that ends in Duchene (close to the Cooperative owned land) opens after the monsoon season (hopefully early December). Electricity has been connected from the recently repaired micro-hydro power system at Tawal but solar power will still be needed to complement that electricity supply to ensure 24 hour 365 days a year access to electricity. <p>November 2017 update</p> <ul style="list-style-type: none"> Solar panels have been purchased and installed.
<p>9. Purchase of 700 chickens (broilers and egg laying)</p> <p>Procurement and transport of 700 chickens (broilers and egg laying) to Tawal.</p>	<p>Evidence e.g. invoice of chickens purchased.</p> <p>Evidence of success in selling of broiler chickens and eggs e.g. cash income received by Co-op.</p>	<ul style="list-style-type: none"> Will be purchased when the rough road that ends in Dushene (close to the Cooperative owned land) opens after the monsoon season (early December) Need to follow up the issue of Newcastle disease on our next visit. <p>February 2017 update</p> <ul style="list-style-type: none"> Egg-laying chickens purchased. 30-40 died in transit from Chitwan. They have to arrive within 3 days of birth. Chickens receive vaccinations for 1st five weeks (powder in water) and are fed pellets and water. Small wood burner and solar lights in the chicken shed to keep chickens warm as nights still cold in the mountains for newborn chicks. Chicks need 1-2 months of extra care (old caretaker is coaching the new caretaker) before the broiler chickens are purchased. 6-7 months before chickens are producing eggs. <p>November 2017 update</p> <ul style="list-style-type: none"> The Coop has stopped raising egg laying chickens. They say they can't produce eggs cheaper than what eggs produced on the Terai can be purchased and transported to Tawal by truck. The Coop also had some difficulty with the egg laying chickens due to inexperience of the young caretaker (now replaced by older more experienced caretaker who returned to the position when the latest purchase of 450 broiler chickens was made at the end of the monsoon season. The withdrawal from the egg-laying chicken market has resulted in one of the two chicken houses (originally built by Cooperative members and then replaced with NAFA funds following the April 2015 earthquake) not being used for raising chickens. Concern was expressed about this during our visit. The response was that the second chicken house will be used when the broiler chicken business expands to a point where use of the second chicken house is needed. That seems like an unlikely prospect in the next few years (Rod's view) so will be followed up in subsequent visits.

- It takes about 45 days for a broiler chicken to grow to a size (up to 3.5 kgs) where it can be sold. The selling price per whole chicken is on average 1,500 Nrs (\$20 or say \$5.70 per kg). But this is too expensive for one family who often would to purchase say 300 gms for an evening meal.
- The Coop would like to purchase a refrigerator/freezer and contract the butchers (Suman and his wife Kalpana) to cut up the chickens and sell in smaller quantities, storing the unsold meat in the fridge/freezer.
- Problem with that is the micro-hydro has limited capacity and has disallowed refrigerators, which shops and some residents would also like to have. Met with the head of the micro-hydro subcommittee and requested an exemption as the refrigerator will provide benefits for the whole community and the Cooperative. They would also need a generator to run the fridge from 6-10 pm, the peak period for draw on the micro-hydro system.
- Another option discussed was a solar + inverter (instead of a generator) but the generator was considered a more reliable, stable option year round.
- Funding options were discussed but Kanchha was informed that NAFA cannot help at this stage due to being fully committed on the rebuild of classrooms in seven schools. They may borrow the money from the Savings Bank (in someone's name), repaying the loan from the profits on the sale of chicken meat.
- With the refrigerator and a newly designed incentive system in place for the caretaker Coop leaders expressed the view that the chicken business should grow, taking up both chicken houses constructed initially with Coop member funds and then with NAFA funds after the earthquake. To be followed up in subsequent visits.
- Chicken feed is currently purchased in bags from the same source as the purchase of chickens. Kanchha says the feed has a 45 day expiry date. The Cooperative would like to make their own feed by buying millet and corn from local farmers and buying other ingredients needed. Kanchha says making their own feed would also extend the expiry date.
- Followed up trying to find out what is in the feed on our second visit. Took a photo of what is written on the bag and also on a feed supplement (Doxycycline and Neomycin for control of chronic disease such as E-coli) mixed in with the feed.
- Kanchha says there are three types of feed (B0, B1 and B2) fed to the chickens based on their age. On the bag is also written (use before 45 days).
- Label (in English) indicates supplement is made by Abyss Pharma Private Limited for Shekher Pharmaceuticals Pvt Ltd in India. Instructions are with the packet. Will follow this up further in Brisbane with Professor Joanne Meers*, who is in the Agricultural Sciences Department in the University of Queensland, specialising in third world chicken raising.
- There will be a break in purchasing chickens over the winter because of the cold. To be followed up as to why heaters can't be installed in the Cooperative chicken house to keep chickens warm in January and February.

*See responses to queries regarding chicken feed in the footnotes below.

<p>10. Goat rearing training for a pilot group of 10 women</p> <p>Increased capacity/knowledge to rear higher value “she” goats in the Tawal area.</p> <p>Introduction of new higher value goats to the area</p>	<p>Evidence of goat rearing training completed</p>	<ul style="list-style-type: none"> • Training conducted 23-24 June by Keshab Luitel, government vet from the district agricultural department. No written training material was provided to the group but Kanchha (Chairperson of the HRDC and Cooperative and local teacher) said he took extensive notes. • Feedback from the Co-op meeting was that the women found the training quite complex and not always suitable to the small farmer context. The trainer was a government officer and of higher caste. Some of the content, farmers reported, was more suited to large goat farms that existed in other parts of Nepal. • A farmer from Salleri with the largest goat herd in the area indicated that he found the training useful. • Kanchha reported that this trainer was the one assigned by the Vet office for this training program. • Focus of this project was on 10 of the poorest women farmers (1 recently became a widow after her husband died in a bus accident going to pick up the first government compensation installment for all those (100% in this area) whose house was destroyed in the April 2015 Gorkha earthquake, the epicenter of which was only 20 kms away from this area. • All 10 women were interviewed by a University of Queensland social work student on placement in Nepal under the supervision of Dr Deborah Setterlund, Research and Evaluation Officer in NAFA. Translation was provided by Pratika Shakya from Joy Foundation Nepal (Kathmandu based charity and long-time NAFA partner in Nepal.) • See separate evaluation report. <p>November 2017 update</p> <ul style="list-style-type: none"> • The model being used for follow-up training is for someone with vet qualifications (Indra Tamang, who is also a school teacher at Tawal school) to provide support to individual farmers experiencing difficulties or needing vaccinations or advice. • 8 out of the 10 goat farmers interviewed a second time during second visit to Tawal by Deborah and the recently appointed Women’s Social Mobiliser. The other two were away from the village for medical reasons. Farmers said they used the proceeds from the sale for daily living and education related expenses. One farmer had to sell her goat earlier than she would have liked due to financial pressures.
<p>11. Allocation of 10 ‘she’ goats to 10 women plus one ‘he’ goat</p> <p>Improved economic wellbeing of women in the agricultural cooperative through a pilot higher value “she” goat project</p>	<p>1) Record of 10 “she” goats allocated to women in Cooperative e.g. official record, photos.</p> <p>2) Evidence of cash income from goat sales at a time to be confirmed in visit to areas Nov 2016</p>	<ul style="list-style-type: none"> • Goats purchased and distributed to the ten women participating in the program. • Goats purchased are called Jamanapari (developed) goats. Their large ears distinguish them from the local Khari goats. • Kanchha (Chairperson of Co-op) has reported that two he-goats have been born from goats distributed through the project. He said they will be worth 15,000 Nrs (\$200) in 6-7 months time which he says is good income for the women. Four other goats are expecting kids in the next few months. All the women are happy. • See separate evaluation report. <p>November 2017 update</p> <ul style="list-style-type: none"> • 10 families have received Jamanapari goats, including one low-caste (Dalit) family. The Coop leaders would like to allocate more goats to Dalit families but they lack land though they are interested. We suggested that perhaps they could offer 50-50% profit on sale of the goats in return for use of another farmer’s land. To be followed up. • 9 baby goats have been born (6 he-goats and 3 she-goats). One of the goats had triplets and they all died (including the mother) at birth. Another women whose goat had a she-goat gave the woman who lost her goat her newly born she-goat. Two he-goats have been sold for 7,000 Nrs (\$93) and 8,500 Nrs (\$113). Farmers pay 200 Nrs (\$2.67) to the Coop when a Jamanapari goat is sold.

		<ul style="list-style-type: none"> The first she-goat born to a Jamanapari goat is to be handed over to another poor family after 2-3 months. Records are being kept by the Coop for future follow-up. The Coop also owns a he-goat “stud” which services local goats at a 100 Nrs for breeding to all local farmers, regardless of whether they are Coop members. Grasses that are good for these goats are: “Tanki”, “Ipl” and “Nimaro”. Unfortunately farmers have to walk 2 hours one way to collect this special grass which they need to do twice a week. The goats need to eat a mixture of this special grass and other grass/plants. Special grasses will be grown in the new Coop nursery and sold to members of the Coop.
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<p>12. Building of 10 goat sheds (bamboo & wood)</p> <p>Good quality standard of sheds (bamboo & wood) for “she goats” involved in the pilot project</p>	<p>Record of 10 goat sheds constructed for women in Cooperative e.g. official record, photos</p>	<ul style="list-style-type: none"> Not all goat sheds have been built as many farmers still displaced from the earthquake and not living on their land yet permanently as government has only allocated a portion (50,000 Nrs = \$667 of 3 lakhs (\$4,000) promised to help rebuild homes destroyed by the April 2015 earthquake (18 months ago at the time of the visit). See separate report on an evaluation of the goat project conducted by Avalon Wood. <p>February 2017 update</p> <ul style="list-style-type: none"> 4-5 goat houses built and others will be built before the monsoon season as the goat houses are not needed as much in the dry season when the goats are out in the fields. Will need to follow-up. 3 he-goat kids have been born. She-goats will be redistributed to other Co-op families but none so far have been born. A number of mixed long-ears (Jamanapari) – local goat mix have been born using Kanchha’s privately purchased he-goat. <p>November 2017 update</p> <ul style="list-style-type: none"> Below table has been updated. All goat sheds have been constructed (five sighted) and every goat has had kids. <table border="1" data-bbox="869 986 2116 1492"> <thead> <tr> <th>Name</th> <th>No. of kids born (as at Feb 17)</th> <th>Goat house built (as at Feb 17)</th> <th>No. of kids born (as at Nov 17)</th> <th>Goat house built (as at Nov 17)</th> </tr> </thead> <tbody> <tr> <td>Ram Maya Tamang</td> <td>1 (he-goat)</td> <td>Yes</td> <td>1</td> <td>Yes</td> </tr> <tr> <td>Ganga Maya Tamang</td> <td>1 (she-goat)</td> <td>Yes</td> <td>1</td> <td>Yes</td> </tr> <tr> <td>Damchi Maya Tamang</td> <td>Triplets died at birth</td> <td>Yes</td> <td>1</td> <td>Yes</td> </tr> <tr> <td>Bimila Tamang</td> <td>1 (she-goat)</td> <td>Yes</td> <td>1</td> <td>Yes</td> </tr> <tr> <td>Prem Tamang</td> <td>1 (he-goat)</td> <td>Yes</td> <td>1</td> <td>Yes</td> </tr> <tr> <td>Pokeshi Kanchhi Tamang</td> <td>1 (she-goat)</td> <td>Yes</td> <td>1</td> <td>Yes</td> </tr> <tr> <td>Mangashon Tamang</td> <td>1 (he-goat)</td> <td>Yes</td> <td>1</td> <td>Yes</td> </tr> <tr> <td>Kaishya Tamang</td> <td>1 (he-goat)</td> <td>Yes</td> <td>1</td> <td>Yes</td> </tr> <tr> <td>Ashmita Tamang</td> <td>1 (he-goat)</td> <td>Yes</td> <td>1</td> <td>Yes</td> </tr> <tr> <td>Den Maya Tamang</td> <td>1 (she-goat)</td> <td>Yes</td> <td>1</td> <td>Yes</td> </tr> </tbody> </table>	Name	No. of kids born (as at Feb 17)	Goat house built (as at Feb 17)	No. of kids born (as at Nov 17)	Goat house built (as at Nov 17)	Ram Maya Tamang	1 (he-goat)	Yes	1	Yes	Ganga Maya Tamang	1 (she-goat)	Yes	1	Yes	Damchi Maya Tamang	Triplets died at birth	Yes	1	Yes	Bimila Tamang	1 (she-goat)	Yes	1	Yes	Prem Tamang	1 (he-goat)	Yes	1	Yes	Pokeshi Kanchhi Tamang	1 (she-goat)	Yes	1	Yes	Mangashon Tamang	1 (he-goat)	Yes	1	Yes	Kaishya Tamang	1 (he-goat)	Yes	1	Yes	Ashmita Tamang	1 (he-goat)	Yes	1	Yes	Den Maya Tamang	1 (she-goat)	Yes	1	Yes
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<p>13. Follow up training for goat rearing</p> <p>Early stage monitoring to ensure goats are being cared for as specified in the training program</p>	<p>Evidence of success in pilot project, e.g. cash income, allocation of baby 'she' goats to other women in the Cooperative.</p>	<ul style="list-style-type: none"> • May be held in a year's time. • It was suggested that they try and source someone next time who spoke the Tamang language (preferably) or at least was more responsive to the illiterate farmer context. • See separate report on an evaluation of the goat project conducted by Avalon Wood. <p>November 2017 update</p> <ul style="list-style-type: none"> • The model being used for follow-up training is for Indra Tamang, who lives in Tawal (and is also a teacher), to provide support to individual farmers experiencing difficulties or need one to one advice on goat rearing.
<p>14. 15 months Agricultural training (JTA Junior Technical Assistant /Veterinarian) CTEVT (Nepalese government accredited training)</p> <p>Improved agricultural & veterinary capacity & knowledge in the area</p>	<p>Evidence of JTA/Veterinarian course completed e.g. Certificate attained</p> <p>Longer term: To be confirmed. 18 months from beginning of course.</p>	<ul style="list-style-type: none"> • Co-op members reconsidered the budget they had prepared and realized 50,000 Nrs was insufficient for someone to undertake the course in Kathmandu. Instead they have signed an MOU with someone who is a teacher at Tawal (Indra Tamang), who also has Vet qualifications. They will use the funds provided as service is provided (likely to be more than 2 years). <p>November 2017 update</p> <ul style="list-style-type: none"> • Coop leaders indicated that farmers in the area were losing goats and other animals occasionally to disease and would like a full time vet to be based in Tawal. • But it appears there isn't enough business in the area to sustain a full time vet. I discussed the option of an interested farmer (in addition to Indra who is a teacher) being trained (possibly through NAFA's Further Education and Training Program or eventually from Coop surplus funds) so that he could combine the income from vet services with other farm income. To be followed up.
<p>15. Transport of seedlings, livestock and equipment by truck</p> <p>Safe transport of cardamom seedlings, chickens and "she" goats, solar panels and a coffee pulping machine to the area.</p>	<p>Evidence of transport e.g. invoices etc.</p>	<ul style="list-style-type: none"> • 45,000 cardamom plants and 10 goats purchased and transported to the Cooperative before the monsoon season set in and closed the road in June 2016. • Waiting for regular truck traffic on rough 4WD road as it reopens after being closed and landslide damaged in the monsoon season. First trucks have arrived at the end of the road head at the end of our visit in late November. <p>November 2017 update</p> <ul style="list-style-type: none"> • All animals, seedlings and equipment purchased with EFF funds have now arrived at the Coop.

Information on history of Pesang Chowk Agricultural Cooperative, Nepal government overseeing of Coops and how ideas come to the Cooperative

- Responding to a question from Allan, Kanchha said he thought of the idea to establish a Cooperative when he was doing his business studies.
- 25 families were need to establish the Coop. The District Cooperative Office (Dhading Besi) then issued a Certificate approving the establishment. The Coop needs to send reports to the district Coop office every three months (including number of new members, total number of members, numbers of Saving Bank passbook holders, total amount of balances in the savings bank, total amount loaned to members etc.
- New ideas come from word of mouth, magazines and sometimes from a once a week national television program on Cooperatives.

Multiple roles being played by leaders in Tawal

- Allan was interested in the multiple roles that leaders in Tawal play, particularly in relation to those with roles in the Cooperative. Examples of these multiple roles include:
Kanchha Tamang: Social Studies teacher, President of the Hilly Region Development Club (local NGO established nearly 20 years ago) and President of the Pesang Chowk Agricultural Cooperative
Ramesh Tamang: Maths teacher, local Lama and volunteer bookkeeper for the cooperative savings bank.
Nabin Tamang and Sabita Tamang: Teachers and members of the Loans Mobiliser (approval) subcommittee of the savings bank.
Kanchha Tamang: Builder, Vice President of the HRDC, head of the micro-hydro subcommittee and support person to the Social Mobiliser doing the paperwork for the rebuild program (4 villages in the area being funded by NAFA)

Opportunities and challenges for Cooperative

- Allan and Mike agree that the Coop can be the economic engine to drive income generation and with it transformative change to the area. To grow, infrastructure capital is needed, with profits on savings bank loans to be ploughed back into infrastructure.
- Management of electricity available to the Cooperative (be it from the micro-hydro system or by solar) will be important as it could be a very limiting factor to development.
- Mike also identified succession planning for Kanchha and other key Coop leaders and an important issue that needed to be addressed.

Future (3-5 years) planning frameworks

- Allan suggested looking up “Gazelle planning tool”. For follow up.

Cooperative Savings Bank

November 2017 (with Allan and Mike in attendance)

- Met with Kanchha (President of the Coop) and went through the financial records, audited financial statement and procedures used for the Cooperative Savings Bank.
- 5 local villages involved. Total of 435 depositors. Total deposits held at end of Coop financial year, earning 12% interest calculated on a daily basis = 13 lakhs 91,251 Nrs = \$18,550 (was approximately 25 lakhs (\$33,000) before the earthquake.
- Deposits immediately loaned out (46 borrowers at present) to a wait list of borrowers at 18% (interest rates set by district Coop office). Difference in interest rates represents profit to the Coop to help pay (along with profits from its business arms such as the sale of chickens) overheads and other purchases e.g. equipment and infrastructure. Maximum loan is 2 lakhs (\$2,667)
- As no cash is kept at the Cooperative some members wanting to withdraw some of their funds have to wait until one of the loans are paid back or more deposits are made. When such a request is made the loans stop and the depositor wanting to withdraw funds is given priority. May need to look at having a working capital of say 1 lakhs (\$1,300) so depositors can withdraw funds when they need them but this would require purchase of a safe for the working capital cash held.
- Ramesh (Senior Math’s teacher at the school and chief lama at the monastery) keeps the records on computer, using an excel spreadsheet. A second hand mini-computer that had been donated to NAFA in Brisbane was brought up to Tawal on our second visit in November 2017 to give to Ramesh as his computer no longer worked.
- To obtain a loan you must be a member of the Cooperative and sign an MOU for the loan. You can borrow up to 10% more than your savings balance in the Coop e.g. you can borrow the NRs equivalent of \$2,000 if you have \$1,000 in savings. Interest is paid every four months and if the loan is not fully repaid within a year a new MOU needs to be signed.
- The Loan Mobiliser (approval) committee comprises: Nabin (teacher), Kipa and Sabita (teacher).
- Allan and Mike discussed the goal of the Coop being able to grow its loans and chickens business arms with a view to increasing interest and product sales, with surpluses being able to finance infrastructure such as the fridge and generator and eventually salaries for the admin tasks currently being undertaken by volunteers.
- Mike subsequently made a kind and generous donation to increase the capital available for the Savings bank arm of the Coop to increase its loans, which charge 18% to borrowers in accordance with Coop rules and regulations. These loans are often used for income earning purposes such as the purchase of additional animals etc. He made the donation to trial the micro-financing idea and see what is done with the capital injection. He also expressed the view that Kanchha should look at succession planning to ensure skills and knowledge was transferred to others in the Cooperative. Kanchha confirmed he had saw the need for this, which will be followed up in subsequent visits.

Other potential proposals identified during visits:

Irrigation pipes (subsequently funded by NAFA/district irrigation office/local farmers)

- Nepal's monsoon season lasts about 4 months (June-September) and the remainder of the year is mostly dry. So watering crops has always been an issue.
- While in the area, the trainer undertook a survey of the land owned by the 81 farmers who attended the training and recommended how many plants were suitable for the land owned. He estimated that a total of 10,000 m of irrigation pipe is needed to irrigate the land to water the cardamom (and coffee etc) during the dry season which has just started. The agricultural department at a district level has offered to contribute 50% towards the cost of the irrigation pipes.
- NAFA has asked farmers to also contribute a small amount towards the purchase and has approved an allocation of \$2,787 in a meeting on 8 December 2016 towards the purchase of the irrigation pipes and transport of the pipes to the end of the road-head. Timing of installation will depend on when government contribution can be obtained.

November 2017 update

- NAFA funded irrigation pipes have been installed. Government has still not funded their promised 50% so farmers only received 50% of their allocation. Kanchha says the government irrigation pipes will be received after the national election on 26 November. To follow up in future visits.

Need for an office and storeroom for the Cooperative (including Savings Bank)

- Kanchha indicated in a meeting (attended by Allan and Mike) that all the records for the Coop (including the Savings Bank) are currently kept in a cupboard in his house. People come in at all hours to make a deposit or withdraw etc. He said that the Coop has grown to a point where a small office is needed that could be open for limited hours for business, staffed say by the new women's social mobiliser.
- He also indicated that the Coop needed a separate (but sharing a wall) storeroom to collect products e.g. cardamom before the truck arrives at the end of the road head to pick up the goods.
- Following discussion the best option discussed was to add two rooms onto the plan for the health clinic so additional land would not have to be sourced and purchased.
- Subsequently discussed in Kathmandu with Sabin (Nepalese architect assisting NAFA with the rebuild program).
- Allan indicated that he may consider a proposal for the office/storeroom when one has been prepared and costed.

Other training and knowledge needs identified by Coop members

- Auyevedic medicine and plants (to be followed with Raju Sthrestha, Joy Foundation Nepal President who also imports and sells Auyevedic medicine)
- Fertiliser
- Mushroom

Possible funding from Kathmandu/Dhading Besi based NGO Resource Identification and Management Society (RIMS-Nepal) to establish a fish pond on land owned by the Cooperative

Kanchha says that the Cooperative have been approached by an NGO based in Dhading Besi (RIMS-Nepal) which according to their website is associated with United Mission Nepal, a group that have supported other projects in the Tawal area. He said they heard about the Coop and that the Coop had land. They indicated they were interested in undertaking a feasibility study to set up a fish pond just above the chicken house to farm rainbow trout for local consumption.

If approved, the NGO would fully fund the set-up of the fish pond and provide support for a year before handing over to the Coop. An Engineer has come to village to measure the distance between the local river (which is also the source for the Tawal/Tawal Besi micro-hydro system) and the proposed site for the fish pond. RIMS contact details: Yagyashwor Marga 1-4670975 email: rimsnepal.org.np Also branch in Dhading: Baireni-9 Dhading Tel:10-403100

Bee-keeping

- Co-op leaders feel this is a potential income generating product to expand into and is a priority for training in the future. They feel there is also a good local market for honey. Good quality bee hives are needed. Possible proposal in the future 13 lakhs 91,251
- To be followed up in the future. Good contact may be: Gandaki Bee Concern Gongabu 1-4351093

Planting and cultivation of “sisnu” nettle

- Nettle bush (locally translated as “electricity grass”) was used to make soup in the early settlement of the village.
- Chandra says the bush also is used to produce a hemp like material used to make bags, clothing and other products.
- He says it has grown in the Tawal area (locally known as pacherpolo in Tamang language) for years and once used by women to make bags and clothing. The bark is boiled with ash to keep its natural colour. It is then washed in water.
- Machines can now be used to boil and wash the raw material.
- ICIMOD may have an initiative in this area. Being followed up with Achut Singh, who has just come back from working for ICIMOD on an earthquake rebuilding program.
- Other contact may be via National Micro Entrepreneurs Groups Association (Saugat Griha, Tripureshowar Tel: 1-6215404 Email: nmeganepal;@gmail.com

Other agricultural related information

- Millet or corn is used to make Dhiro (doughy brown colour) is eaten with fresh vegetables e.g. spinach and vegetable curry/pickle). It is boiled in water and is the staple Tamang diet for lunch and dinner. Corn is planted in amongst the millet and is harvested first before the millet.
- Each millet stalk has to be individually and manually planted in the farmer’s “nursery” plot before being transplanted to his/her field. Because it is very labour intensive farmers are trying to get out of that crop, instead planting bamboo, cardamom and coffee etc.

The chicken issue: Context, queries put to expert and responses

NAFA has been working with and supporting an agricultural cooperative in the hilly region of Nepal northwest of Kathmandu. They have been raising broiler chickens for sale in the community. It is an important income source for them and helps pay the caretaker's monthly salary.

Chicken feed is currently purchased in bags from the same source as the purchase of chickens. The feed is manufactured by a company called Pancha Ratna, which is based in Chitwan (southern Nepal). According to their website Pancha Ratna also manufacture feed for other animals and also sell other products such as vitamins for animals. The ingredients are not on the bags but the Coop buy three types of feed (B0, B1 and B2), fed to the chickens based on their age. Also on the bag is written in English "Best before 45 days". They also feed a supplement to the broiler chickens which they mix in with the feed. Its package is written in English, including ingredients and instructions on use. The ingredients are Doxycycline and Neomycin which when I look up via Google seems to be the control of chronic disease such as E-coli? The supplement is made by Abyss Pharma Private Limited for Shekher Pharmaceuticals Pvt Ltd in India. .

The President of the Coop, Kanchha Tamang, tell us that the chickens are raised and sold within about 6 weeks. He said they attain a weight of 3 - 3.5 kgs (though we didn't verify that estimate while in Tawal). When we saw they look quite fat and not very frisky. But Kanchha and others here say that is normal for broiler chickens. Our other main contact here says that hormones are widely used in Nepal. We are concerned about the use of hormones in the feed. The Cooperative would like to make their own feed by buying millet and corn from local farmers and buying other ingredients needed. Kanchha says making their own feed would be good for local farmers, perhaps reduce the cost of raising the broiler chickens and maybe also extending the expiry date of the feed.

Our queries to the expert are below in black font. The expert's responses are in blue font:

1. Is weight gain of 3-3.5 kgs in six weeks for broiler chickens normal or does that likely mean that hormones are being used in the feed?

This seems like a very large and rapid weight gain, even for a broiler chicken, which have been genetically selected to eat and grow at a phenomenal rate. At 6-8 weeks, I think they should be around 2 kg, not 3-3.5 kg. Whether that's the result of hormones in the feed, I can't say. Regular broilers at slaughter weight do look fat and sluggish, they sometimes have trouble walking around because they've put on weight so quickly their bones and tendons haven't had time to keep up with the growth of muscle and fat.

2. Are hormones widely used in the raising of broiler chickens, including in Nepal and should we be concerned about this?

Hormones are banned for use in chickens in most countries, I think there's an international ban on their use in chickens. However, animal feeds in developing countries are poorly controlled, there is little regulation, and if there are regulations in place, they are often not enforced. Should you be concerned about it? It depends on who you listen to! Hormone growth promotants are used in cattle in Australia and the US and the US still allows growth hormone in dairy cows – though most other countries have banned it. Some authorities say it doesn't affect consumers at all, others say it does.

3. Is there any way of finding out what the ingredients are for the chicken feed that they are using?

We've tried on a few occasions to find out the ingredients of commercial chicken and pig feeds in Myanmar, the Philippines and Timor Leste for various projects, with limited success. There are multiple reasons for this. It can be a very competitive market, so one company doesn't want others to know what they put in their feed. They could also be concerned that they might get caught for using a banned ingredient. With our in-country partners, we have sometimes managed to find a contact in a feed company who has given us the type of information you want. I can't think of anything else to suggest.

4. Could they produce their own feed locally and if so what should be in the ingredients?

It's possible to produce local feedstuffs for animals— but probably not for commercial broiler breeds of chickens. These birds have been so genetically manipulated, they require a certain diet at different stages of their short lives. They convert the feed very efficiently, but they need to consume a lot of it. To recreate that diet from local feedstuffs would be difficult. You need certain amounts of carbohydrate and protein sources, the ratio changes as they grow.

We had a PhD student who looked at local sources of feedstuffs available in Timor Leste – but that was to feed native chickens or spent commercial layer birds (or hybrids of the 2), which are totally different breeds to broilers. I can send you his thesis if you'd like – much of it I don't understand because he had a nutrition supervisor who took care of those chapters. I know he looked at things like cassava, sweet potatoes and various beans and measured the nutrient value in these products and how they could be combined to make a balanced diet to supplement scavenging. But I don't think this would work for commercial broiler birds – they are bred to be constantly hungry!

5. Does the above described food supplement seem ok for the chicken's health and those who consume the meat?

The doxycycline and neomycin are antibiotics. Although we do use antibiotics in some animal feeds in Australia to prevent common bacterial diseases, it is tightly regulated. There are withholding periods before slaughter, so that antibiotics won't be passed into the meat/milk/eggs, and antibiotic residue testing is performed routinely. In an unregulated situation as you describe, it's likely that antibiotics are passing into the chicken meat. This might not be particularly harmful, but it's not good for the global war on antibiotic resistance.

6. Are there any other supplements that you would recommend in the context of a remote village of Nepal?

For growing broilers, you probably need to do it the way your farmers are doing it, i.e. they are "contract growers", with the company providing the birds, the feeds and the medications. The farmers provide the housing and the labour. This is fairly common throughout Asia, mostly from the huge poultry companies in Thailand, such as CP, but sounds like your company is Nepalese, or perhaps Indian? Where there more flexibility/opportunity is growing native chickens or hybrid native/layer birds, trying to increase the growth rate and productivity/egg production of these birds. Their dietary requirements aren't so strict, they can actually walk around (whereas broilers get too heavy for their legs!) and with minimal inputs you can increase the outputs.

A word of caution re extending the expiry date. The main issue with spoilt feeds is mycotoxins (fungal toxins) which can cause liver disease and worse in chickens. This is especially a problem in hot humid SE Asia, maybe not so common in Nepal. If you mix your own feeds you're possibly even more likely to get fungal contamination, so you need to be careful about storing feeds for long periods.

Further information provided by expert as it relates to native breeds of chickens raised by villagers

It's very difficult to play around with the diet of commercial broiler birds, which have such strict requirements for nutrients in order to grow to slaughter weight in just 6 weeks – but for regular chicken breeds like the native breeds you see scavenging around villages, or commercial layer breeds (like we have in our backyard flocks), you can get a reasonable return on the investment of buying commercial chicken feed to supplement the feed they get from scavenging and household scraps.

Most of our work in developing countries has been with scavenging native chickens, but you also see spent layer birds in villages (commercial layers after their year in production – the same as in Australia where people get spent layers for their backyard flocks) and in some countries they breed a hybrid between a native breed and a layer breed to get better egg and meat production (from the commercial layer part), but still able to survive on poor resources and able to go broody and sit on eggs from the native part (broodiness has been bred out of commercial layer breeds).

We found in our study in Myanmar that the biggest losses in native chicken flocks occur at the chick stage (not surprisingly) and if you do a simple intervention of providing a safe place (coop) for chicks until they are about 3-6 weeks old to prevent predation and exposure to the elements, plus provide them with commercial chick starter feed, the households sold more chickens (after ~ 8 months of course, which is how long it takes to grow a regular type of chicken), and ate more chicken meat than the households without the intervention. The cost-benefit ratio was excellent.