



Himalayan Project

En Dansk NGO der yder egnsudviklingsstøtte i Nepal

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Preliminary Project Overview

on

Bakanje Tea Cooperative Factory

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The Tea Bush

Tea is produced from the leaves of the Tea Bush, *Thea sinensis*, with the subspecies *Thea viridis* and *Thea Bohea*. And again many varieties are propagated by cuttings and claimed to grow and produce differently in different altitudes and conditions. Probably this is not completely true. If the tea bush is growing well producing fresh green leaves it can also produce a good tea. The bush prefers a good fertile loose soil and not too less water and regular supply with nutritious compost. But it also grows very well in sandy soil near the river, if it is given compost regularly. And some shade, not too much and not too less, and not too cold. The higher altitude the more slow is the development and productivity of the bush, but also the higher content of flavor and substance, until a certain height where the growth conditions become too critical. Probably an altitude around 2200 meters will give the finest tea in proper quantities. Up to 2600 meters good tea can be expected but with lesser quantities, and contrary down to 1500 meters the quantity will be higher but quality somehow less. But microclimate and local conditions will influence this rule. The more severe conditions the less caffeine. The slower growth the more methyl salicylate which is connected to taste. Left alone the tea bush will grow into a bushy tree up to 20 meters high.

The bush is reproduced by cuttings during monsoon period from well-established bushes. The cuttings are placed few cm down in hard puddled soil which is always kept wet and protected against direct sun and wind. After 1-2 years the cutting has established a branch with leaves and can be planted out in the field. After ½-1 year it is around ½ meter high and has to be cut down to 9 inch to force new shoots to grow up forming a low bush. After 2-3 more years the bush has to be cut into shape, but before doing so, the first leaves can be picked first.



Local conditions for tea

In Bakanje tea can be grown in any altitude between 1500 to 2600 meters. Kenja is situated around 1600 meter with sandy soil near the river. Chhimbu and Sete are situated in 2100 to 2700 meter facing south with good soil but less water. Chhiringkharka and Lole is also mild south facing places at 2300 to 2800 meter, good soil and less water. But also the scree facing west should be worth trying in some places, but they are influenced by the clouds condensing with the valley winds over the Likhu Valley. A

Horticulturalist visiting Bakanje in spring 2014 stated that the growing conditions in many places of Bakanje are something between good to perfect.

Harvesting the tea

The tea can be picked from the tea bushes when they are 3-4 years old as counted from the year where they are planted out in the garden. The golden tip is harvested from the bud, before the leaf is unfolding. The silver tip is harvested from the bud and the first freshly unfolded leaf. The harvest will be small in quantity, but the quality will be absolutely top end. But this kind of exquisite production has to wait until Bakanje Tea is well recognized. Practically in Bakanje it shall be the bud and two leaves harvested in the spring around



April-May and once more between summer and autumn around August and some places even a third harvest in September-October. It could be very tempting to harvest three or even four leaves, as those last leaves are much heavier than the young ones. But the quality is poorer and poorer the older the leaves are. At least, the leaves delivered to the factory, should never be lower than bud plus two leaves to produce an export quality. When the tips by the end of the branches are harvested, a new bud and tip will develop. Therefore harvesting the bushes have three purposes, to harvest tea leaves, to develop new tea leaves and finally to make the tea bush into a shape where new tips can develop and easily harvested.

From a full developed bush around 1 kg of leaves can be picked every year. And 4,25 kg fresh leaves can produce 1 kg of tea.

Processing the tea leaves

The processing of the tea to reach a marketable product can be done in many different ways and even before starting the project of establishing a Tea Factory in Bakanje it has to be decided which kind of tea shall be produced. Most tea sold worldwide is "Black Tea", but "Green Tea" provide higher price if the quality is high. Also Yellow Tea, White Tea, Oolong Tea and other processing can be chosen. But we will concentrate on Black Tea in Bakanje, but propose that the factory will experiment with producing other types. Basically the process of black tea consists of four treatments: 1: Withering and drying of the fresh leaves, 2: Rolling, 3: Fermentation and 4: Final Drying by heat. And of course finally packing and storing, and then marketing. Each of the four processes can be done in many ways depending on the person by whom you seek advice, as well as local experiences coming up as production develops. Therefore the Cooperative Committee which shall be responsible for the set-up of the factory shall seek advice many places and finally take decision on the exact method which they want to implement in Bakanje. Some processes can with good benefit be done by machinery, while others with benefit can be done with more simple means or maybe in a combination. The more machines, the more uniform product but also less sophisticated, taking care of the details. The fewer machines the higher demands to the human skills and the more variation in the product quality, which is a positive factor if the product is in very high end, but a risk if the product is more average. The more

machines, the more equipment can be damaged and the higher percentage of the profit shall be saved for maintenance.

Practically in Bakanje a “Small Scale Factory” shall be built. at least for a start. It can process 250 kg of fresh tea leaves per day. But it also means that there shall be made appointment with producers when and how much they shall deliver.

0: Delivery by the producer shall be as soon as possible after picking. The leaves shall, by evening after picking, be put into a basket, where they can lay loose and airy. And immediately after completing the picking it shall be delivered at the factory, where the processing shall start immediately after having weighed and evaluated the delivered leaves.

1: Withering and drying of the fresh leaves to make the skin fragile and starting enzymatic processes. This can the best be done by spreading out the leaves on a Withering Trough with a fine meshed net on top. Here a sorting and evaluation of the delivery can be performed. A treatment



with steam for 3-4 minutes could be beneficial for the fermentation process. The withering process will happen directly on the trough by



letting a wind pass through the mesh, alternating letting a cold and hot wind pass through. The fan consumes around 4 kW when heat is on, and probably

4 homemade troughs are needed to wither 250 kg of leaves. The process is complete when the leaves look wilt, copperbrown, and have lost 60% of their weight. The fermentation process is starting here, and it is solely controlled and decided by an experienced technician, who decide when, and how much cold and hot air to add. This process is complete after 10-12 hours so it will be complete by morning.

2: Rolling shall break the skin of the leave letting the juice of the leave coming out on the surface to speed up fermentation and oxidation. This is done in a Rolling Machine where the pressure can be adjusted so the leaves will be broken without spilling the juice coming out. The less pressure, the longer time in the roller, and the higher pressure the shorter time. This will depend on the experience of the worker who operates the machine, but probably the rolling process should take about half an hour with 15 kg of withered leaves at the time. This process can also be done by rubbing between hands, but this will be a lengthy and quite hard process but will leave more of the aromas in the tea. The roller needs 1,1 kW to operate and the weight is 350 kg, but it can be dismantled for transport.



3. Fermentation/Oxidation shall be ongoing in a special and clean room, where the temperature can be controlled by heater and ventilator. It can be spread in a 1 inch thick layer on the floor or on bamboo trays maybe even in a rack. This is the process which creates the final taste, color and content of the tea. The time it takes to ferment the leaves depends on so many factors, that only the experience of the technician, dealing with the process, can determine when the process is complete. It can take 1 hour, or 3, or 12 or even 24 hours. When the leaves have the same brown orange copper color as a cup of tea and the strong pleasant sweet aromatic smell, the process shall be stopped very fast. Too short and too long fermentation will give less or even immature or vapid taste in the tea. One way of producing green tea is just to skip this process.

4: *Final drying by heat* shall stop the fermentation process very fast. Initially it can be done by frying the tea in very hot pans for a short while. This can add some elements to the taste. Then it shall be transferred to either a Micro Wave Dryer or a Revolving Dryer for normal tea or a Double Pot Tea Dryer for curly tea. The drying air shall be hot and the process shall be ongoing until the tealeaves have turned black and completely dry so they easily break. But on the other hand utmost care shall be taken that it will not overcook. The taste from the fermentation shall be preserved, not evaporated. The Micro Wave Dryer is working fast and efficient drying 15 kg at the time for 20-25 minutes, consuming 9 kW. This machine weighs 250 kg and can't be dismantled.



5. *Sorting and Grading* shall happen first on a table where tea with wrong size, color or shape can be removed. Tea can be sold in 3 different Grading: 1: **Leaf Tea** with whole leaves, 2: **Broken Tea** with broken leaves and 3: **Fennings** with dust and fine particles. Broken Tea is the most common, so the leaf tea can be changed into broken by breaking them in a Mill or Crushing Machine or in hand and then divided in broken and fennings by a sieve. A machine exists which can perform all these processes in one passage. It takes 2 kW to operate.

6. *Tasting* shall finally ensure the quality of the tea. Each production shall be evaluated individually by an experienced and well trained person, who can distinguish the quality criteria of the produced tea: 1: the leaves: a: appearance, b: color, c: smell, d: grade of rolling, 2: Cup test: a: color, b: smell, c: taste and d: appearance of infused leaves.

7. *Pricing the tea* shall be done by the person, who has followed the whole process from beginning to end. All the measurable criteria from one delivery shall be noted down in a standard framework, so the quality of the delivery can be measured which will again influence the price which the producer can receive for the leaves delivered. This is to ensure that the producers understand that they will benefit from delivering the best product without cheating and carelessness.

8. *Packing* shall be according to the market demand. For a wholesaler it shall be packed in bulk packing. For local market in sealed alu-plast bags. For tourists the alu-plast bags shall be put into an attractive bag or box. This can be produced in the Kenja Handicraft Centre which is under preparation right now.

9. *Marketing* is the real final evaluation of the tea. If it can't be sold, it will not create any benefit to anyone. Only if the tea is exceptional high quality it will sell almost by itself. Dealers and buyers will come on own effort to buy, and the price can go up. But for normal qualities all the members of the cooperative shall give their effort and power to convince each and everyone, near and far, that they shall buy the tea from Bakanje Tea Producers Cooperative.

The population of Bakanje VDC

Solukhumbu District is divided into 47 VDCs (Village Development Committee) which again are divided into 9 Wards. The number of households and population data was obtained in 1996 and again in 2013, but the last one isn't released yet. But our own survey in 2012 and 2014 show that the VDC is still developing with new houses being built. 25% more houses are there today than in 1996, so if the population is growing with same rate the population should be around 1.650 today. During the last 5-10 years the growth of population has stagnated due to higher awareness about family planning. And due to that the age group between 16 and 25 is almost absent and the group

Ward	Households 1996	Population	Male	Female	Households 2012	Households 2014	Teaproducing HH Nov. 2014	Number of bushes Nov. 14
1	26	141	73	68	29	35	9	292
2	17	95	40	55	21	24	8	2.655
3	38	207	107	100	57	63	15	3.380
4	16	71	32	39	17	17	5	2.458
5	35	168	93	75	39	42	14	13.471
6	20	124	57	67	23	25	5	167
7	30	167	88	79	25	28	10	24.329
8	23	95	50	45	32	35	3	75
9	53	253	126	127	52	53	14	625
All	258	1321	666	655	295	322	83	47.452

between 25 and 35 is also less than what should be expected. That is due to the lack of opportunities to find occupation and income beyond the traditional farming, which can only occupy two of the children in each family. The rest of children migrate to Kathmandu or even abroad. But due to a very low standard of education in the VDC, the migrating youth from Bakanje are generally not among those who reach the highest levels of society. But on the other hand they are rarely reaching the bottom of society too due to their healthy growth in Bakanje. Himalayan Project has been working in Bakanje for 17 years now with strengthening the education, by building and reconstructing five

schools, giving scholarship to 80 students, paying the salary of four teachers and supporting schools with educational materials. The last 2½ years we have run a Women Empowerment Program (Bakanje WEP) and from now and 10 years ahead we will start running a program promoting further the educational level of the schools. More and more students who are more or less influenced by our projects are now leaving school and arriving into unemployment or migration. So now we are starting making projects which can give employment and increased income to our own magnificent youngsters whom we wish to keep here at home in Bakanje. A Cooperative Sewing, Weaving, Knitting Factory is on the way. A Buying-Sales Cooperative for agricultural products is developing, and now the Cooperative Tea Factory is close to reality. A Cooperative Ketchup Factory is in the preparatory stage.

Tea Production Today.

In 2010 24 women of Chhiringkharka (ward 1) addressed us about tea farming. Nine of them already had bushes, but they needed help to gain knowledge, skills and marketing. We took five samples of home produced tea for Kathmandu to have it evaluated by a Tea Shopkeeper Ganga Rai. Only one sample was drinkable, showing some knowledge. It was produced by Som Maya Tamang in Marbu. But the rest was something between undrinkable to disgusting. Anyhow we promised the women to pay attention to tea production, so more women started to plant more bushes.

When we started the Bakanje WEP in 2012 we performed a Baseline Survey among the women of Bakanje, where we among others asked: "Do you have tea bushes?", "How many?" and "How old are they?". **52** women replied "Yes" and replied that they had in total **2.214** bushes. But it was also clear they were not very much cared for, as they rarely appear as more than a big bush; almost a small tree. In Bhandar VDC, few hours walk from Bakanje, they are producing a fair tea, which they export for a very good price. This has encouraged many



people during the last few years in Bakanje to plant new and to extend what they already have.

But only very few in Bakanje had any idea how to treat the leaves to produce tea. Most people just pick the leaves at any time and any size and any age. And then they stamp it with a heavy rafter in a mortar and dry the juiceless leaves in the sun. This creates a tea with little color, little smell and a taste of grass in best case or even mouldy in worst case. But then we in Bakanje WEP employed a Horticulturalist to give training in the growing of vegetable and tea, and then the interest grew dramatically.

Bakanje WEP Baseline Survey November 2012 & 14: Do you have tea bushes? How old are they?							
Ward	Tole	Name	Nov. 2012		Nov.2014		
			No.	Years	No.	Years	
1	Patale	Patale	Deumaya Thami	1	2	1	3
		Patale	Kanchhi Phuti Thami			10	0
		Mathilo	Kanchhi Sherpa	20	10	58	3-8
		Mathilo	Sonam Dolma Sherpa			1	9
		Vasme	Somaya Thami	1	2	1	2
		Chhiringkharka	Chokpa Sherpa			35	0
		Chhiringkharka	Chokpa Sherpa	4	7	80	1
		Chhiringkharka	Yangdu Sherpa			3	6
		Chhiringkharka	Lhamu Sherpa			4	10
		Chhiringkharka	Furwa Doma Sherpa	100	1-24	100	2-20
2	Chhiringkharka	Chhiringkharka	Chima Sherpa	3	4		
		Chhiringkharka	Ang Phuti Sherpa	10	7	30	2-7
		Chhiringkharka	Saani Lama			30	17
		Chhiringkharka	Dolma Sherpa	40	20	50	25
		Lole	Tenji Dolma Sherpa	150	5		
		Lole	Dolma Sherpa			5	20
		Lole	Dali Lama			700	6
		Lole	Yangdu Sherpa	7	5		
		Marbu	Sommaya Tamang	40	2	40	3
		Marbu	Dolma Tamang	40	1		
		Orale	Maya Sherpa			1500	3
Orale	Sumi Lama			300	1		
3	Upper Sagardanda	Sagardanda	Rekha Khadka	2	2		
		Sagardanda	Kalpana Bashnet	150	1-5	200	4-15
		Sagardanda	Bal Kumari Khadka			3	1
		Sagardanda	Phulkumari Khatri	4	3	5	5
		Sagardanda	Saraswati Karki			100	1-2
		Gaira Ghar	Sita Bashnet			4	2
		Lamjura	Maya Sherpa	200	6		
		Dakchhu	Purnimaya Tamang	2	15		
		Dakchhu	Lheki Sherpa	1	15	13	2
		Dakchhu	Banda Sherpa	40			
		Themjeng	Pemba Diki Sherpa			80	0
		Themjeng	Nimi Sherpa			62	0
		Themjeng	Kami Chhirri Sherpa			100	0
		Themjeng	Daati Sherpa			2.560	0-1
		Themjeng	Indra Kumari Tamang			3	1
Chaite Kharka	Lhakpa Doma Tamang	13	4	16	6-7		
4	Bakanje North	Dingmateng	Pemba Sherpa	150	1-20	35	15
		Dingmateng	Dolma Sherpa			2.000	0
		Gumbadanda	Dawa Jangmu Sherpa	11	20	210	1-15
		Bakanje	Pemba Lhamu Sherpa	13	11	200	2
		Bakanje	Lhakpa Doma Sherpa	5	10	13	6

Bakanje WEP Baseline Survey November 2012 & 14: Do you have tea bushes? How old are they?

Ward	Tole	Name	Nov. 2012		Nov.2014	
			No.	Years	No.	Years
5 Bakanje South	Bakanje	Yangji Sherpa	100	15	4.000	0-8
	Bakanje	Pasi Sherpa			16	0
	Bakanje	Chhiki Sherpa	2	7		
	Bakanje	Pem Doma Sherpa			700	0
	Bakanje	Pemba Lhamu Sherpa			700	0
	Bakanje	Maya Sherpa			800	0
	Bakanje	Tuku Sherpa			200	0
	Bakanje	Lhakpa Doma Sherpa			400	0
	Bask	Furdiku Sherpa			1.000	0
	Gongdanda	Anita Ghimere			8	0
	Gongdanda	Kalimaya Thami	2	10	2	15
	Dandatol	Dati Sherpa	4	12	300	0
	Dandatol	Mingma Doma Sherpa			845	0-7
	Dandatol	Yangdi Sherpa	30	25	500	2
6 Lower Sagardanda	Sagardanda	Susmita Kharki	20	2		
	Sagardanda	Harkamaya Bashnet	2	2	2	2
	Sagardanda	Harkamaya Bashnet			1	5
	Sagardanda	Thir Maya Bashnet			2	5
	Sagardanda	Om Kumari Basnet			2	2
	Sagardanda	Purna Kumari Bashnet	50	2	60	7
	Dandaghar	Naramaya Bashnet	1	3	100	8
7 Sete	Ngimar	Jangmu Sherpa	7	1	2.200	2
	Patalekharka	Doma Sherpa			500	0
	Patalekharka	Bishnu Maya Tamang			5.925	0-2
	Guranse	Mingma Lhamu Sherpa			200	2
	Themjeng	Nim Lhamu Sherpa			800	1-2
	Themjeng	Sani Sherpa			100	2
	Taaljang	Man Maya Karki			4	0
	Sete	Mingma Chhoti Sherpa			300	1
	Sete	Maya Sherpa			300	1
Sete	Susma Lama	60	6	14.000	0-2	
8 Chhimbu	Chhimbu	Chhoti Sherpa	60	5	22	15
	Chhimbu	Kesi Thami	5	7		
	Chhimbu	Hira Maya Thami			10	5
	Chhimbu	Dhanamaya Thami	2	2		
9 Kinja	Septeng	Ngawang Diki Sherpa	40	5	120	0-10
	Septeng	Lakai Bhujel			24	0-4
	Pasaldanda	Mirakumari Pradhan	1	6	1	8
	Pasaldanda	Jhuma Tamang			10	10
	Kinja	Gyanu Khadka	100	1		
	Kinja	Phuja Khadka	200	3		
	Kinja	Chirima Sherpa			40	0-6
	Kinja	Dolma Jharel			1	2
	Kinja	Kharki Jharel			1	7-8
	Kinja	Balkumari Khadka	7	3	200	4
	Kinja	Radha Khadka	75	7	100	7
	Kinja	Sanghita Basnet			10	6-7
	Kinja	Shradha Bashnet	5	3	47	0-4
	Kinja	Dilkumari Pradhan	1	6		
Kinja	Lhaku Sherpa			30	1	
Kinja	Lhaku Sherpa	2	5	40	2-5	

In autumn 2013 I produced around 50 grams of tea. Several kilo of leaves were delivered, but after selecting only the tips and new leaves only little was left. We rubbed it between the hands until the surface were broken, and then in a closed plastic bag during the night on the warm oven. Next morning some leaves had changed color into black but the rest were still green. We made a solar dryer from a carton box with a sieve with tea leaves inside, and hot air

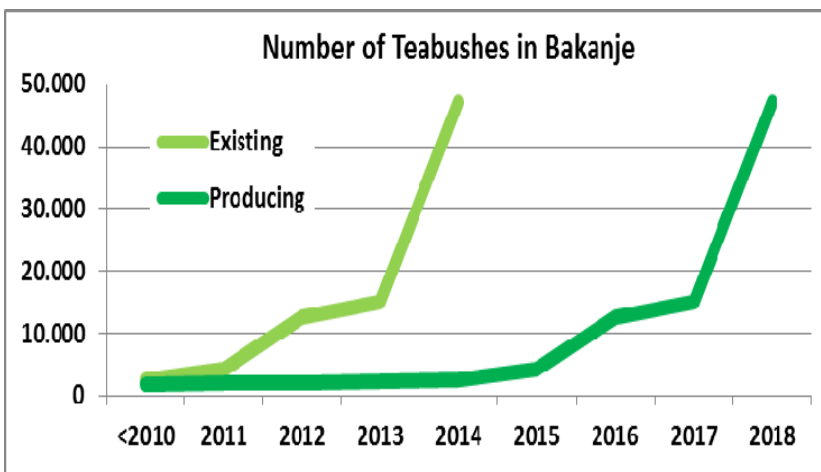


produced between a flat stone and a plate of glass. Cows and goats were very interested in the smell, so a guard took care all day. By evening it was a little dry and we made a cup of tea. Color fine, smell weak but taste promising.



In autumn 2014 we again performed the same baseline survey of WEP, to evaluate the results of that program. And we found a dramatic growth. Now **83** were owners of bushes and they had more than **50.000** bushes. We didn't survey all houses and only women were visited, and we know that at least two unmarried men have around 8.000 bushes, so probably the number is more than 60.000. And more are on the way and even more will come. But the majority of those new coming bushes is still in the stage of cuttings or newly transplanted which have to be cut down to develop bush shape. So far the

most of bushes still need 3-4 years before they can start producing in bigger scale. But by then the production should reach 5-10 ton of tea if nothing goes wrong.



Project Planning.

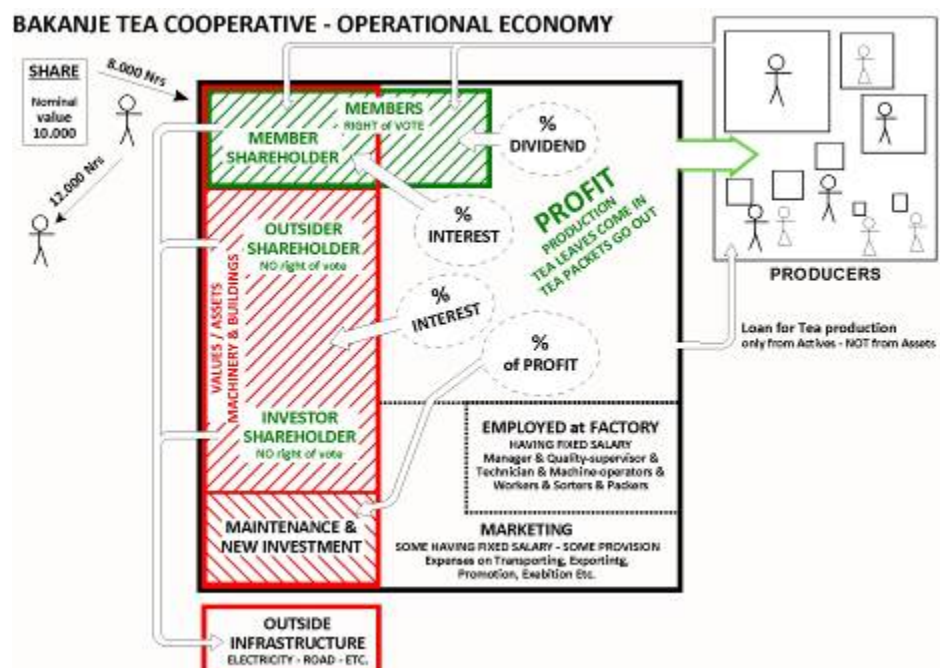
This autumn a group of farmers with WEP visited Ilam in south-eastern corner of Nepal to see how tea is produced practically. Unfortunately it was in the late and of season, so they didn't see all. Such a visit should be repeated in April-May when it is high season. But anyhow they brought a lot of knowledge and inspiration for home. Also in Jiri, only two days walk from Bakanje, there is a private owned tea factory which we must visit on the way out from Bakanje. If it shows worth visiting many people from Bakanje can visit from time to time to gain knowledge.

Probably some few large scale producers could afford to make some kind of processing plant on their own, but for the rest it will be far beyond their economic ability. If we wish to spread the opportunity to as many people as possible, we have to support a tea producing factory substantially. Actually near 100% if we don't want the lowest option to come in act. There must be enough space from the very beginning to meet the production at any time. There must be sufficient and stable electricity to secure machineries operation at any time. Machineries shall be of a proper quality and big enough to meet the demands many years ahead. There shall be enough machines to secure the right treatment of the tea. Probably right now building a Small Scale Factory is the best option, and then adding one or two more if the success is obvious.

It has been a demand from our side to the women and to the few men involved in the tea farming that we will only go into the establishing of a tea factory if it will be ruled under the concept of the Cooperative Movement with the Danish Andelsbevægelse as a model. All who have even just one tea-bush in Bakanje can be member of the cooperative. Only members and all members have one and equal vote. All members shall have a dividend from the profit of the factory. There can be investors, who shall have a certain interest on their investment. There shall be employed staff from administrative manager and scientific manager to machine operators, specialized and unspecialized laborers, who shall have a salary whatsoever. There shall be a saving policy where a certain amount shall be kept for maintenance, replacements and development. And finally there are the producers who shall share the profit with reference to their delivered quantity and quality. We have to make sure that it will not change into a more or less private business for few main bulky producers.

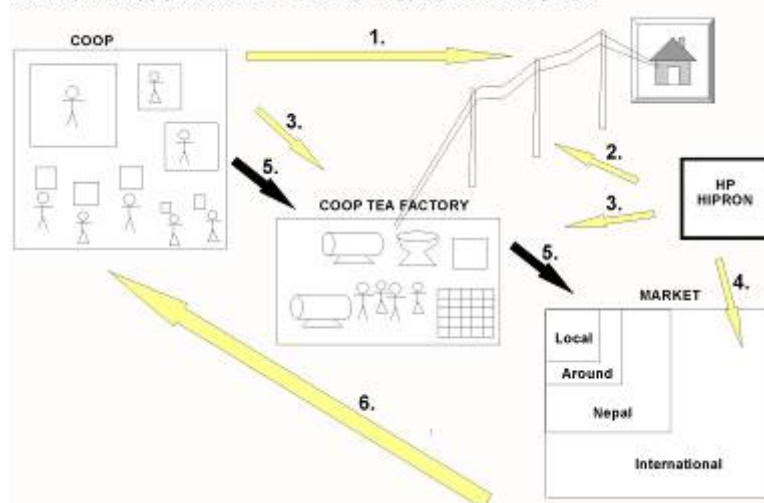
Bakanje Tea Cooperative is already established under the name of "Shree Sagarmatha Organic Tea producer and Product Cooperative" have been through a registration and approval at the district headquarter with the support of District Cooperative Office. Their 80 pages Cooperative Constitution is written in Nepali and is now being translated into English.

During a meeting in the cooperative in autumn 2014 it became clear that their understanding of the organization was on a very low level. There were 35 members who was also identical with those who had bought shares of 100 NRS each. Some bought one and some bought ten. The last two years WEP has



developed cooperative saving & loan in all villages, so now this concept is well known and therefore it was decided to use the incoming share amounts for loan giving to gain the interest, which is a little higher than the inflation. Therefore no money is available for preliminary investment in the cooperative, and the interest in increasing the share amounts was very low with the majority of members. I produced two graphic explanations on how shareholders can have different number of shares and gain benefit when the factory is running, and also how it is important that the cooperative itself invest in the production. And several members understood and immediately raised their share amounts.

BAKANJE TEA COOPERATIVE - INITIATION ECONOMY in DIAGRAM



At the meeting I emphasized for the coop-members that they couldn't just sit and wait for us to do everything for them. The planning and decision around the cooperative itself and the factory is their task and creating sufficient electricity is also one of their major processes. Immediately they held a meeting with Bakanje Micro Hydro Power which resulted in the decision to initiate the process of upgrading the power station. I demanded the coop-committee to produce a report on their decisions and progress before the end of December.

If one bigger scale factory shall be build, it has to be centrally in the VDC, which is somewhere around Sagar-Bakanje. But still it will take several hours to bring in the leaves from for instance Patale and Kenja. If the demand will be that freshly picked buds shall be delivered late afternoon, it will be a problem for those living more remote. There could also be several smaller scale factories in Chhiringkharka, Sete and Kenja. But then the quality will vary from factory to factory, which can be OK if level is high all places, but very bad with varying level. Building a Small Scale Factory which can process 250 kg fresh leaves daily will probably meet the demand for the beginning. It means that in the half year season from April to October the production from 50.000 full developed bushes can be processed into 5-10 ton of black tea.

But there need to be sufficient and stable electricity. The national grid is approaching and are now reaching neighboring Chaulakharka VDC but there are no plans for now to proceed. The small private owned 80 kW Chari Khola Micro Hydropower Project in Korem is only delivering electricity for households during nighttime and doesn't operate at daytime. They are very interested selling electricity for a tea factory during daytime, but we will also need substantial electricity through the night as well. They are planning to add one more generator to produce extra electricity during the rainy season. But anyhow it isn't sure enough to spend money on a grid from Korem to the factory. A new private owned Perun Khola Hydropower Project is under survey to produce 250-500 kW. But it is far from sure that it will ever come into existence. The preparation to make a Likhu Khola Hydropower on 70 mW is ongoing, but have long time yet.

Locally in Orale, where Bakanje Micro Hydro Power is operating, the 13 years old 20 kW generator has now reached a production of 5 kW. This autumn Himalayan Project did some repair to increase safety and a survey was done by German Christoph Berning on the plant to evaluate how it could come back to the original 20 kW. It was found that this could be done within limited investment, which we demanded the locals to do themselves if they were interested. But anyhow the Tea Factory will need at least 10-12 kW to operate in in some situations up to 20 kW, so the production will still not be sufficient to run the factory together with the community. In 2009 a

major survey was done to prepare for an upgrade of the plant in Orale. At that time it was decided not to go into the project due to lack of unity and willingness to invest personally. But now it was quickly decided to ask the Energy Sector Assistance Programme (ESAP) to update this report and to initiate the process of upgrade. It seems like this decision process can be completed within few months, and when financing is cleared the construction can probably be completed within a year leading to production of 50 kW by mid-2016.

Already now we shall start thinking marketing. Of course the imported low cost and low quality tea from outside will be replaced by local tea. Not only in Bakanje but also in nearby vicinity. Road construction is ongoing through Bakanje and it will reach Sagar-Bakanje within 1-2 years giving access to drive a tractor on the road outside of the monsoon period. But stand-alone opening up markets is difficult. Therefore an option cooperating with other producers, at least for the beginning, is searched.

A very preliminary evaluation on planning and prices can suggest the budget of our support to be 100-150.000 DKR for support to upgrade Bakanje Micro Hydro Power. 150.000 DKR to build the factory itself with electric connection and parking facilities. And finally 150.000 DKR to purchase, transport and install machines. So 450.000 DKR of which the first third should be available already in early spring 2015, second third in mid-2016 and last third by end of 2016.

Next serious step towards Bakanje Tea Cooperative Factory will happen during winter and spring 2015, where the activities of the cooperative will show off and new proposals will develop afterwards. But until then, this is the level of the project.

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Kurt Lomborg, Manager of Himalayan Project

