

Solar panel project for the Lower Kolyma region of the Republic of Sakha-Yakutia, Russia; a four year collaboration.

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Introduction

This report describes the events which have unfolded in the attempt to train two candidates from Siberian communities to become solar engineers. This training is devised and conducted by the Barefoot College, an organization based in India which is primarily involved in rural development. The training process lasts a period of six months and is designed to result in a candidate becoming fully proficient in the construction and maintenance of their community's own solar powered light project. The aim of this venture was to take solar light technology to the nomadic reindeer herders of the Chukchi Nation (Turvaargin and Nutendli communities) located in the Lower Kolyma region of the Republic of Sakha-Yakutia, Russia.

My involvement in this story stems from my meeting of many of the key characters at the Arkleton Trust 2007 seminar.

Key characters

Bunker Roy: Founder of the Barefoot College.

Tero Mustonen: Founder of Snowchange Cooperative.

Vladimir Visiliev: President of the Northern Forum Academy.

Elena Antipina: Head of Khalarchinsky Nasleg Administration (Turvaargin).

Vyacheslav Kemlil: Head of Nutendli community.

Maria Krivoshapkina: Trainee Solar Light Engineer, Turvaargin (Appendix 1).

Marina Tatarinova: Trainee Solar Light Engineer, Nutendli (Appendix 2).

Dilip Tripathi: Translator to the two candidates in their time in India.

Laxman Singh: Key member of the Barefoot College solar project training team.

Information in this report regarding the partner organizations was accumulated by the author during interviews with key project members. For a more detailed review of the partners work and aims please visit:

Snowchange www.snowchange.org

The Barefoot College www.barefootcollege.org

The Arkleton Trust www.arkletontrust.co.uk

Turvaargin community <http://eloka-arctic.org/communities/russia/turvaargin.html>

Nutendli community <http://eloka-arctic.org/communities/russia/nutendli.html>

Timeline

Summer 2006	Call for proposals by the Arkleton Trust under the heading: Rural Community Impacts of Climate Change and Associated Amelioration and Mitigation Measures.
November 2007	Arkleton Trust Seminar entitled: Community preparedness for – and resilience in coping with - impacts of climatic change and natural disasters. Bunker and Tero first contact and project proposition.
December 2008	Snowchange Symposium held at New Zealand. First meeting between Bunker and Siberian community leaders.
March 2009	Maria Krivoschapkina and Marina Tatarinova travel to Ladakh to begin training as solar engineers.
June 2009	Maria Krivoschapkina and Marina Tatarinova travel from Ladakh to Tilonia.
July 2009	Author's visit to Tilonia.
August 2009	Marina Tatarinova returns to Russia without completing training.
September 2009	Maria Krivoschapkina returns to Russia after successfully completing training.
October 2009 – April 2010	Contested time between the Barefoot College and other partners' organizations.
April 2010	Snowchange trip to Kolyma attended by the author.
April 2010 – March 2011	Awaiting shipment of solar panels from India to Russia.
March 2011- May 2011	Solar panels in Sheremetyevo International Airport, Moscow, awaiting import certification.
June 2011	Solar panels receive import certification and are allowed to proceed on final journey to Yakutsk and then Kolymskoe.
October 2011	Batteries for solar panels were purchased in Moscow and transferred to Yakutsk. They will be sent to Kolymskoe by winter road.

Beginning

The idea to send candidates from the Lower Kolyma Region of the Sakha Republic Yakutia (Siberia) to undergo training as solar engineers at the Barefoot College (India) was born at the Arkleton Trust's 2007 seminar. The Arkleton Trust is a research group, which, founded in 1977, has the aim of 'studying new approaches to rural development and education' and 'improving understanding between rural policy makers, academics, practitioners and rural people'. The Trust holds a triennial seminar relating to matters of rural interest and concern. The 2007 seminar entitled 'Community preparedness for – and resilience in coping with - impacts of climatic change and natural disasters' was held between 4th and 8th November, at Dounside House, Tarland, Scotland.

A competitive request for proposals of work, under the heading 'Rural Community Impacts of Climate Change and Associated Amelioration and Mitigation Measures' in the summer of 2006, laid the foundation for the 2007 seminar. Selected from these submitted proposals, four International Research Fellows were funded to conduct detailed pieces of work. The four Research Fellows and the papers they submitted were:

Tero Mustonen, Snowchange (Finland and Russia) 'Community based observations of ecological and weather related changes, and responses in settled and nomadic communities of Republic of Karelia and Niznekolymyskiy Region, Republic of Sakha (Yakutia), Russian Federation and the Province of North Karelia, Eastern Finland', (September 2007).

Hilda Zara Montilla (Venezuela), 'Community Resilience and Preparedness In Coping With Impacts Of Climate Change And Natural Disasters', (July 2007).

Motilal Dash (Rajasthan, India), 'Rural Community Strategies for Managing Economic and Social Impacts Of Climate Change', (August 2007).

Ugyen Penjor (Bhutan), 'Study Of Climate Change And Impacts In Hill Villages In Bhutan', (August 2007).

A synopsis of these papers can be found at www.arkletontrust.co.uk under 2007 Seminar, seminar briefing paper.

Of all the Research Fellows, only Ugyen Penjor, from Bhutan, did not attend the 2007 seminar (due to visa problems). A number of other attendees from Canada, China, Norway, Algeria, India and the UK, representing NGOs and research groups from around the world, were also present. Bunker Roy, representing the Barefoot College, was one of the attendees.

The four day seminar was used as a platform to present the findings of the papers undertaken by the four Research Fellows. Other members of the group also contributed descriptions of relevant work that their organizations were involved in. Tero Mustonen spoke of the work that Snowchange had conducted and the partnership that had been formed with aboriginal reindeer herding communities in the Lower Kolyma region of the Sakha Republic Yakutia (Siberia). These were two Indigenous Chukchi communities, Turvaargin and Nutendli.

History of Kolymskoe, Turvaugin and Nutendli communities

The village of Kolymskoe is the only municipality of Chukchi in the Republic of Sakha-Yakutia. It is the centre of the municipality Khalarchinskii nasleg (nesleg is the Russian word for municipality). The village was founded in 1941 in the area of the summer camp of Yukaghir people, on the left bank of the Kolyma River, just opposite the mouth of the river Omolon. It is situated 180 kilometres away from the settlement of Cherskii, the centre of the district. The population of the village is 804 people. Reindeer herding, hunting and fishing are the main areas of occupation of the local population.

The Indigenous Turvaugin Chukchi community is a nomadic reindeer herding community with its headquarters in the village of Kolymskaya in the municipality Khalarchinskii, located in the Nizhnekolymskii district of the Republic of Sakha-Yakutia, Russian Federation. The Turvaugin community is the main employer and a central economic force in the village of Kolymskaya. Turvaugin is an *obshchina*, a clan or kin based Indigenous community enterprise as defined by Russian Indigenous legislation.

The Nutendli Chukchi obshchina has reindeer herding areas on the Eastern bank of the Kolyma River. The Nutendli community formed when they split from the Turvaugin community in 1989 and the process was completed in the early 1990s.

From Exchange for Local Observations and Knowledge of the Arctic Website [www. eloka-arctic.org/communities/russia/](http://www.eloka-arctic.org/communities/russia/)

Tero outlined the Snowchange philosophy of giving ownership of all work conducted back to the subject group. This, explained Tero, was achieved by returning to communities to present and seek approval of all work that they had carried out. If the community were not comfortable with the work of Snowchange, it would be amended or rejected at their discretion.

This idea of community ownership and the moral guidelines of Snowchange mirrored that of the Barefoot College. The Barefoot philosophy is based on community empowerment, through their ownership of development strategies. This, as outlined by Bunker at the seminar, is achieved by a process of training and support of strategic members of the partner group.

The Barefoot College is unique in its targeting of middle aged illiterate women, keystone members of the community, to become fully competent solar and hydrological engineers. The Barefoot College has worked extensively with communities in India, Africa and Afghanistan with much success.

Over the four days many topics were covered, with the findings of the seminar suggesting that many rural and indigenous communities were putting initiatives into place in order to adapt to climate change. Many of these communities, however, were not being identified, nor were they sharing the lessons they

had learnt. A synopsis of the Seminar can be found at www.arkletontrust.co.uk under Seminars, 2007 Seminar Report.

On the final day of the seminar Bunker and Tero announced to the group that a collaboration between Siberian communities that Snowchange had worked with, and the Barefoot College had been suggested. Bunker had approached Tero with the ambitious aim of bringing solar technology to the Turvaargin and Nutendli nomadic reindeer herding groups.

Tero explained that, in accordance with Snowchange doctrine, he was not able to make any decisions for the Siberians communities. He did explain, however, that he would put forward the idea to the Siberian communities through the President of the Northern Forum Academy, Vladimir Vasiliev, who worked as the Snowchange Coordinator for Sakha-Yakutia.

The Northern Forum Academy, a partner organization of Snowchange since 2003, was set up to tackle issues in higher education, research, between the Arctic Provinces. Vladimir, as well as being president and international spokesperson for the Northern Forum Academy, is an Ecologist involved in the monitoring of species on the IUCN Red List of Threatened Species.

Vladimir agreed to act in the pivotal role as mediator in this project between the Siberian communities and the Barefoot College. By the end of the Seminar, the idea in principle appeared to have been warmly welcomed by Turvaargin and Nutendli. The long process of implementation was then to begin.

Implementation

The first half of 2008 was spent promoting the idea of the solar project to the Turvaargin and Nutendli communities. This was aided by the use of two DVDs, documenting the work completed by the Barefoot College in India and Afghanistan. Candidates from Turvaargin and Nutendli, who matched a strict criteria set by the Barefoot College, were provisionally nominated to undergo training as solar engineers. However, several objections were raised by members of Turvaargin and Nutendli to some of the selection criteria. As declared by the College, candidates would have to be from the targeted community, female, middle aged and illiterate. It transpired that, at the time of proposal, strong cultural differences began to show between the previous Barefoot College projects and the proposed Siberian project. Most concerns from the Siberian communities were focused on the insistence that the candidates must be illiterate.

In previous projects the Barefoot College had selected middle aged illiterate women, who belonged to the communities that they intended to solar electrify, to undergo a six month training programme in India. The training was designed to result in a candidate becoming fully proficient in the construction and maintenance of their community's own solar power project. The College had a record of great success with this approach, with communities in India, Africa and Afghanistan.

The concept of training illiterate candidates is a central principle of the Barefoot College. The College believes that any individual can become a proficient solar or hydrological engineer. The strategy is used to challenge established principles of aid and knowledge transfer; these are that a candidate has to be able to read and write to undertake technical training. The Barefoot programme is conducted with oral-visual educational systems, which, in the words of Laxman Singh, a key member of the College training team who was heavily involved in the Siberian project, "is spoken through the language of the heart". On completion of training, the candidate will not receive any certification of competency, another Barefoot principle, as this might encourage them to leave their home community in search of higher paid employment in urban areas.

The notion of illiteracy, however, was greatly offensive to many of the Siberians - under the Soviet regime Russian Citizens had been educated to a high standard. Tero explained in later discussions that an illiterate person in Russia is considered a social outcast. These criteria proved impossible to achieve from the targeted communities in Siberia. A solution was needed and came in the form of potential candidates, irrespective of their level of education, signing paperwork sent by the Barefoot College to declare illiterate or semi literate status.

New Zealand Snowchange Symposium

As Bunker was unable to travel to Siberia in order to meet any potential communities or candidates, he compromised by agreeing to attend the Snowchange international symposium, December 3 -7 2008, being held in New Zealand. Representatives of the Turvaugin and Nutendli also attended.

Representing the Turvaugin community was Head of Khalarchinsky Nasleg Administration, Elena Antipina. Representing the Nutendli community was Head of Nutendli Community, Vyacheslav Kemlil. This was the first time, following a year of proposals, that Bunker and community leaders from Siberia were to meet.

The Snowchange 2008 Symposium followed up their partnership with the Maori since 2005. Representative of the Waitara Maori community, Mrs. Mahinekura Reinfelds, had attended Snowchange 2005 in Alaska, USA, as well as Snowchange 2007 in Sakha-Yakutia. The 2007 event in Siberia had led to several connections with the Kolyma communities and a wish for a partnership on a number of issues, including Indigenous education, language revitalisation, land rights, Indigenous women's movements and so on. Immediately after the 2007 event, Mahinekura invited the Northern communities, especially the Siberians, to come to Aotearoa, New Zealand, to witness what the Maori had done.

Sadly, in December 2007 she passed from this world. All of the partners of Snowchange felt that they would come to honour the memory of Mahinekura in her homelands and, so, the 2008 Snowchange Symposium was organised. The event included the unveiling of Mahinekura's headstone.

The Symposium produced the Mahinekura Reinfelds Declaration, which outlined a vast range of issues of cooperation as a result of the event in Waitara. One of the most significant was the detailed plan for the solar electrification of the Kolyma communities, following the meetings between Bunker and the communities.

Tero, present at most of the meetings between Bunker and the Siberians, outlined the main topics of discussion at the symposium. The key themes to these talks were: monthly community expenditure on lighting and heating. This would be used to calculate nominal repayments from the community for solar equipment. There was also discussion of potential trade links being established with other communities, once the candidates had successfully completed their training. It was suggested by Bunker that technical 'know how' and equipment could be exchanged with surrounding communities. The possibility of several reindeer herding brigades* and stationary settlements being solar electrified was also proposed. No formal agreements, outlining the size and capacity of the project, were, however, agreed.

*A brigade is a unit of reindeer herding, consisting of a reindeer herd, several reindeer herders, a tent keep and a brigadier (senior member).

It was decided that the Turvaugin and Nutendli communities of Kolyma were to act as the testing ground for the Siberian solar project. The reasoning for this lay in the belief that, if the solar panels were successful in the harsh and unforgiving environment of the Arctic Tundra, then bringing the

Barefoot Solar model to other areas of Siberia would appear a viable option. A strong feeling of goodwill was said to be present between all partners at the end of the meeting in New Zealand. It is also important to note that, at this point, the Siberian communities felt they had been promised the solar panels for free.

On returning to their respective communities, Elena Antipina and Vyacheslav Kemlil, were to oversee the final selection of candidates to undergo training in India. The candidates, as previously stated by the Barefoot College, had to be illiterate, middle-aged women. With the idea of illiteracy put to one side, three potential candidates were proposed to undergo training in India. Unfortunately, due to an undisclosed reason, one of the candidate pulled out of selection in early 2009. This left Maria Krivoshapkina (Turvaugin) and Marina Tatarinova (Nutendli) to undertake the training programme.

Maria Krivoshapkina has lived and worked in the village of Kolymskoe since 1976. She has had close association with the brigades of Turvaugin since this time, visiting the Tundra on many occasions. (Appendix 1)

Marina Tatarinova is a resident of Cherskii. Since 2007, she has worked closely with the Nutendli community as a Deputy Head for administrative issues and a Tent Keeper. (Appendix 2)

Maria and Marina begin training in India

Maria Krivoshapkina and Marina Tatarinova travelled to India on 13th March 2009 to begin their training as solar engineers. The Barefoot training course is scheduled to run for six months. It is designed in such a way that a person with little or no literacy skills, who does not speak the same language as the instructor, can become proficient in the construction and maintenance of their own community's solar project. The programme also removes the need for intervention from an outside source once the training is complete, as the solar panels are built and maintained by those within the community. This community based knowledge is felt by those at the Barefoot College to result in a demystification of technology, with the effect of empowering the people and communities involved in the programme.

Maria and Marina were to undertake their instruction on becoming solar engineers at a training centre in Ladakh. Ladakh is situated in the foothills of the Himalayas in Indian Kashmir, 3500 metres above sea level. This location was chosen over the more generally used Tilonia site, as it experienced temperatures closer to those of the Siberian summer months. It was hoped that this would provide a more agreeable climate for the women than that found in Tilonia. Tilonia is located in the Indian state of Rajasthan, one of the hottest and driest states, and can experience peak summer temperatures in excess of 50°C.

On arrival in Ladakh, Marina immediately began to develop health problems. Experiencing heart pains and general sickness, Marina later revealed in interview that she had suffered with a lung function disorder for many years, which had been triggered by a bout of sickness back in Siberia. This lung dysfunction made the altitude of Ladakh impossible for Marina to acclimatize to. She later explained that she had persevered with the training for as long as possible, but reached such a level of discomfort that she could not continue.

On realization of her continued health problems, the Barefoot College commissioned a translator, Dilip Tripathi, to discuss with Marina her continued discomfort. Dilip's first contact with Marina was via the telephone and he was later also to attend to her in person. Dilip reported that Marina was anxious to return to Russia, stating her continued health problems and difficulty in acclimatizing to the altitude as the reasons for this.

The impression of life in Siberia, given by Marina at the time of her discomfort to those at the Barefoot College, tarnished the rest of the project. Marina, in later discussions with me, explained that, in her desire to return to Russia, she had exaggerated the quality of life and the disposable income available to the communities in Siberia. She hoped that, by alluding to this, it would secure her immediate return to Russia - funded by the Barefoot College. These statements, given by Marina, were to alter fundamentally the funding framework of the whole project. Bunker consequently felt that the solar equipment should not, as previously discussed, be donated by the Barefoot College. The communities in Siberia would, therefore, have to fund the project themselves.

Email quote from Bunker to Tero and Vladimir, 23rd August 2009

“The payment of the solar equipment is indeed a serious problem. From our discussions through the Interpreter I got a impression that the communities are in a position to pay at least partially for the solar equipment. The condition of the African communities is infinitely worse than their 2 Russian women. So we need to come to an agreement who will pay for the solar equipment”.

A decision was made by the Barefoot College that it would be best for both of the women to be moved to Jaipur, the capital of Rajasthan. This was so that Marina could receive a higher level of medical attention than could be found in the more rurally isolated Ladakh.

Marina, with the aid of Dilip, attended a hospital in Jaipur. Having undergone three days of tests and general health checks, the outcome was that Marina was found to be medically fit. Marina suggested a possible explanation for this might be the fact that she was no longer at altitude at the time the tests were carried out. It was then agreed that Maria and Marina would continue their training at the Tilonia college. This decision was to cause subsequent problems for those at Tilonia.

The women had been moved from Ladakh to Rajasthan in early June, one of the hottest times of year. Midday temperatures of between 45°C - 50°C proved unbearable for both women to endure. Provision had to be made for them, with visitor accommodation at the Barefoot College being modified for the two women. Air-conditioning units were installed into a small living area that was to become their home during their stay in Tilonia.

The air-conditioning units required a large amount of power in order to function, too much to be powered by the electricity generated by the solar panels at the Tilonia college, the usual source of power for all electrical appliances. They were instead powered by a generator, which had to be in operation 24 hours a day. The generator was estimated to cost \$50 for every day that it was used.

The fact that the women had to be kept in air-conditioned rooms also meant that they could not conduct their training alongside other trainees at the college. At this time, as well as the Siberians, a total of 32 women from 7 different African countries were receiving training at Tilonia. Maria and Marina were completely isolated from the goings-on around them.

Maria (left) and Marina undertaking practical training at the Tilonia College. Photo by author 2009 (see photo gallery)

My week in Tilonia

I arrived in Tilonia on 5th July and immediately had my first of two meetings with Bunker Roy, the man whose vision and dedication had resulted in the creation of the Barefoot College. Bunker held many concerns about the way in which the training programme for the Siberians was developing. The primary concern was that it was now beginning to cost so much financially. Bunker estimated a daily cost of around \$100: \$50 per day to power the air-conditioning units and \$50 for every day that Dilip spent with the women. One of the guiding rules that Bunker had applied to the Barefoot approach was that things should be done at as low a cost as possible. This was driven by his belief that a major obstacle to development was the notion that it was too expensive. Bunker's model showed that change was possible without huge financial investment. He stated to me that, in his opinion, the best solution to the current problem would be for Maria to travel back to Ladakh and for Marina to go back to Russia, without completing her training. I had yet to meet the women myself.

The next day I met Dilip to discuss the situation of the two women and then, subsequently, met for the first time Maria and Marina. Over the following week I spent a huge amount of time with the two women and began to understand some of the issues that they were facing. It transpired that Maria was also suffering with health problems. Her thyroid gland had been removed some years ago and she was now taking a hormone replacement medication to treat this. This, however, left her susceptible to a hormone imbalance, triggered by environmental stress. She now faced this on a daily basis. Maria estimated a 10kg loss in weight over her stay at Tilonia. It is important to say that Maria faced this hardship with both courage and endurance and it was only after getting to know her over a period of days that she expressed to me the level of discomfort that she was experiencing. Maria had settled well in Ladakh and had only faced problems after her transfer to Tilonia. Maria, with her characteristic strength, expressed to me her willingness to endure these hardships, if this was what was needed for both Marina and herself to complete their training as solar engineers.

Poor candidate selection was an issue raised many times during my stay in Tilonia. It was not only raised by Bunker and others at the Barefoot College, but also by the women themselves. Both groups, however, held differing opinions as to the underlying problems associated with the selection process. Bunker believed that Marina had been poorly selected and might not have met his criteria to enter the solar training programme. The women, on the other hand, believed that the strict criteria imposed for selection, including the prerequisite that the candidate had to be middle-aged, excluded a large proportion of potentially viable candidates who might have been chosen.

Concerns that Maria and Marina did not live directly with the Nutendli and Turvaugin communities, that they intended to solar electrify, were raised by the Barefoot College. Marina is a resident of Cherskii, a former Soviet port town on the Kolyma River, and Maria lives in Kolymskoe, a village 180 kilometres upstream of Cherskii. This, in the opinion of many at the College, was another deviation from the successful strategy previously used in the Barefoot solar projects. It is the belief of those at the College that candidates should be an integral part of the community they are intending to solar electrify.

Vital to the Barefoot system is the seeding of knowledge directly within the community, if it is to result in empowerment of those within it.

The fact that Maria and Marina did not live all year round with the Turvaugin and Nutendli brigades appeared, once again, to highlight the cultural differences between previous work of the Barefoot College and the Siberian projects. The communities the College had worked with in India, Africa and Afghanistan were where sedentary lifestyle was the norm, whereas the Turvaugin and Nutendli communities are semi nomadic. Tero explained that social relationships in Siberia were very complicated. People based in a village, town or city might have very close links to the nomadic communities in the Tundra. The reindeer herding communities are semi nomadic; both reindeer, and herders, follow ancestral migratory routes for reindeer pasture, whilst their families live a more stationary village existence. This phenomenon, a relic of Soviet collectivization of reindeer herding, allows for very strong links to exist between members of the settlements and the reindeer herding brigades.

During the second of my two meetings with Bunker, I was asked to open an email debate with all of the project partners to establish the best way forward for Maria and Marina. Bunker was still firm in his belief that Maria should return to Ladakh to complete her training and that Marina should be sent back to Russia without completing hers. Marina had, however, stated to me during our interviews, and to Vladimir in telephone conversations, that she wanted to complete her training in Tilonia. Bunker's call to send Marina home appeared to be based around two beliefs. First, he believed that to keep Marina in Tilonia would cost too much money, thus breaking a fundamental Barefoot rule. Second, Bunker believed that Marina was a poor selection of candidate and that she did not fully appreciate the importance of the task she was undertaking.

Subsequent to a large volume of email correspondence with those involved in the project and meetings with key Barefoot members, it was agreed that Maria would return to Ladakh to complete her training and that Marina would stay in Tilonia. Marina had agreed that she would reduce her use of the air-conditioning units to six hours throughout the night, to two hours during the hottest part of the day. This reduced the expense of Marina's stay in Tilonia to an acceptable level. Extra donations had also been secured from the Snowchange Cooperative and the Arkleton Trust, to cover some of the additional costs facing the Barefoot College.

I expressed concerns to Marina that she should do whatever she could to reduce the isolation she might feel when completing her training in Tilonia alone. I encouraged her to try to socialize with other trainees at the Barefoot College in the cooler night hours. Marina showed little interest in doing this.

I began my return trip to the UK by accompanying Maria and Dilip on the first leg of their trip to Delhi. Maria travelled to Delhi with Dilip, via a night bus from Jaipur. She then flew on to Ladakh, independently, the next day. Maria was extremely pleased with these arrangements, as she had previously found Ladakh a pleasant place to stay, not only environmentally, but also culturally. Maria,

characteristically, had made lots of friends in Ladakh and was looking forward to reuniting with the people who had been involved in training her to become a Barefoot Solar Engineer.

It is now worth mentioning a bit more about the whole Barefoot College approach, which is, undoubtedly, a hugely successful system. The College, founded on the ideas and vision of Bunker Roy, was first formed as an organization in 1972. The underlying philosophy of the College is that the knowledge and capabilities to tackle the problems faced by rural communities lie within the community. It simply requires nourishment and development of the skills possessed by the community, to address these problems. The Barefoot College provides an environment devoid of arrogance, where people can develop the skills they have with the aim of aiding others. Bunker does not care for paper qualifications; degrees or PhDs have no relevance, he is simply interested in what people can actually do. This whole approach has resulted in a paradigm shift towards rural development.

Throughout my stay in Tilonia, I was fortunate enough to witness a few of the many projects that had been set up by those at the College. These were:

Night schools

A night school system has been devised to educate children who are unable attend conventional schools. Many children in India are required to work during the day to support their families, resulting in them missing the chance to attend school. The College has been involved in the creation of over 150 night schools, whose aim is to help the children develop basic literacy and numeracy skills. The night school teachers are all members of the community that have a long term commitment to it, for example small land owners or shop keepers.

Children undertaking lessons at a night school class close to Tilonia. Photo by author 2009 (see photo gallery).

Clean drinking water projects

Many clean drinking water projects have also been engineered by the Barefoot College. These are as diverse as simple water harvesting schemes, which aimed to capture clean unpolluted rain water, to reverse osmosis plants which are operational on the village scale. These plants are solar powered and can produce clean drinking water from salt water, supplying the communities and surrounding areas that they are situated in.

Solar powered desalination plant using reverse osmosis to produce clean drinking water. Photo by author 2009 (see photo gallery).

Health care and dental schemes

Many health care schemes have been pioneered by the Barefoot College. Barefoot doctors and dentists have been trained to offer essential basic healthcare to the local community. There is also an education programme which disseminates health care information using traditional puppetry techniques.

International outreach of solar project

The College is also involved in the transfer of knowledge to other communities throughout the world. I witnessed the training of 32 African women from 7 different countries to become solar engineers. The message that the women had to convey, after completing three months of the six month programme, was, in the words of one of the trainees, "Africa is one". The training programme had, to those women involved in it, united them, irrespective of language or cultural differences.

African women undertaking training to become solar engineers at the Tilonia college. Photo by author 2009 (see photo gallery).

This last point is important, when considering the position of the Siberians during their training in Tilonia. The Africa women lived and trained as one group, whereas the Siberians were completely isolated from the rest of the trainees, due mainly to the aforementioned environmental conditions. Although Maria showed a desire to socialize with the other trainees, she was unable to do so because of the extreme heat. Maria did visit the training site of the African women during my week with her; considering her thyroid condition, this must have taken a lot of strength and determination.

Events postdating my trip to India

On my return to the UK, Dilip kept me informed about events in India regarding Maria and Marina. Maria had, as hoped, settled uneventfully back into her training in Ladakh. Marina however was no able to continue with her training at the Barefoot College. Health issues and difficulties acclimatizing to conditions at Tilonia made it impossible for her to continue with work at the College. Marina flew back to Russia on 26th August 2009, without completing her training.

Marina, on her return to Russia, spent a significant amount of time in hospital. She explained, in discussions with Vladimir, that the events in Tilonia had been very difficult for her.

Quotations from an email sent to Tero and me on 21st October 2009, regarding discussions that had taken place between Vladimir and Marina, help to elucidate her feelings on the matter:

Email quote from Vladimir to Tero and Chris, 21st October 2009

“Her health was declined significantly in August, she had stomach problem, many small pets on her legs and hands and she afraid a lot. And it seems that her Indians colleagues also were in great trouble and they thought that she has some infectious disease, so they decided to limit contacts with her. At the same time Marina tried to avoid contacts too but she needed help, so she disturbed Dilip more often, she even called Russian Embassy. And I am sure that Bunker made absolutely right decision to send her home in earliest convenience. She felt herself well now though she still needs some medical procedures.”

Following telephone conversations with those in Siberia, Tero, informed me that Marina’s community felt great shame regarding her early return from Tilonia. I feel that I would be doing a great disservice to both Maria and Marina, if I did not reiterate the events that both women had experienced leading to this point; both women contributed six months of their lives to travel to India to undergo training. They both left family members behind in Russia, who, they had admitted to me, they missed very much. They also both experienced health problems and discomfort, mainly due to environmental conditions, that lasted for weeks. I hope that the above stated events regarding Marina can be viewed in a context of learning and not of blame.

Maria successfully completed her training in Ladakh and returned to Russia on 4th September. Quotes from an email sent from Bunker to Vladimir on 24th August 2009 show the high esteem that those at the Barefoot College felt for Maria:

Email quote from Bunker to Vladimir 24th August 2009

“We are very happy with Maria in Ladakh and she will return as planned on the 4th.” also “She is a real asset to your community and we will be happy to work with her.”

Candidates return to Russia: Contested time

After the return of both women to Russia in September 2009, there was a period of disagreement between the Barefoot College and its Siberian partners. The basis of this was the perceived affluence of the Siberian communities, illustrated in the email below. Bunker, at this point, believed that the two communities had more wealth than he had initially believed. As a consequence, he felt the communities should pay for the solar panels, rather than accept them free from the College. Bunker believed that, if the costs of the current lighting arrangements were considered, for example the diesel generator, diesel, cost of shipment of the diesel generator, then Turvaugin and Nutendli would be able to cover the costs of the solar panels.

Email quote from Bunker to Tero 31st July 2009

"I agree this is not about Africa or Russia but only about affordability. And affordability can only be assessed by the prevailing situation regarding how much communities are paying for lighting today. Whether communities use diesel, kerosene, candles, torch batteries and wood for lighting and how much they spend every month. Usually I visit the communities myself and make an assessment on the spot how poor they are not in relative terms but actual costs. In the case of Russia I depended on others for factual information. From speaking to the women through the translator in Tilonia I get an entirely different picture than what I imagined so now we have a problem facing us that needs to find a solution. Of course I have to be a part of the collective decision to find a solution."

It was decided that the solar panels were not to be donated by the Barefoot College. Other sources of funding would have to be explored. Snowchange proposed to fund the project using resources from the World Bank. However, Bunker was strongly opposed to this.

Email quote from Bunker to Tero, 6th June 2009

"I am ideologically against taking any money from the World Bank. Snowchange is of course free to choose their donors but if WB is involved in any way in OUR program we will not be able to partner with Snowchange".

The partners decided to reduce the size of the project. There would no longer be a community-wide solar electrification, but a more targeted pilot project of one settled area and a nomadic brigade. This reduction would allow funding to be located from different sources and would also allow the equipment to be tested in the Arctic conditions.

Email quote from Bunker to Tero and Vladimir, 27th October 2009

"I am prepared to consider a pilot project to cover Maria's communities and see how the solar panels and batteries function under extreme winter conditions before we proceed to expand to other areas."

My time in Kolymskoe

On 1st April 2010 I was fortunate enough to accompany the Snowchange Cooperative on a scientific expedition to the Lower Kolyma region of Sakha-Yakutia. Several members of the Snowchange group, with a diverse range of expertise, were present on this trip. These fields of expertise ranged from traditional handicrafts, to freshwater biology. Tero Mustonan was also present on the trip.

The trip began with 3 days in Yakutsk, capital of the Republic of Sakha-Yakutia. During our time there, I, along with the other members of Snowchange, met a number of Aboriginal community leaders. At these meetings several of the major issues facing the Aboriginal communities were discussed, for example, land rights, the impact of industry on traditional land use, loss of traditional knowledge and alcoholism. I also met Vyacheslav Shadrin, leader of the Yukaghir people, who accompanied us on our journey to the village of Kolymskoe and the Turvaugin community. Vyacheslav, or Slava as he preferred, acted as an unofficial historian, giving much depth and context to our experiences in Kolymskoe. Also present at our time in Yakutsk was Vladimir Vasiliev.

On 6th April we began our trip from Yakutsk to the Kolymskoe village, the home of Maria and heart of the Siberian solar project. It is worth describing the journey that we undertook to reach Kolymskoe, in the hope of conveying the vast distances separating areas of inhabitation in Siberia. The journey began with a 4 hour flight North West from Yakutsk to Cherskii - a former Soviet port town located in the Arctic Circle. We then travelled 180 km up the Kolyma River by ice road, to the village of Kolymskoe. We then spent several days in the village, before travelling to the Turvaugin reindeer camps in the Tundra. The journey to the reindeer brigades took place via snowmobile and took several hours. At the time of our visit, the reindeer brigades had just begun their long journey north, from their winter camps, to their summer camps on the Arctic Ocean.

Elena Antipina, Head of Khalarchinsky Nasleg Administration and a powerhouse of change in the Kolymskoe community, met our group at the airport at Cherskii. Elena had been involved in the solar project from the beginning and was a key decision-maker in sending Maria to India. We had arrived in Kolymskoe a week before the hosting of an unprecedented Chukchi Conference. The conference was used to showcase many aspects of Chukchi skills and culture. Elena was instrumental in these preparations.

On arrival in the village, I was greeted by Maria and her husband Afanasiy. The couple would be my host for the duration of my stay in Kolymskoe. Maria and Afanasiy are amazing, kind individuals who treated me so well that other Kolymskoe residents would joke that I had a new Russian mother and father.

Our time in the Kolymskoe village began with a 'round the table' discussion covering a range of issues, with community elders and brigadiers. Of paramount importance in the discussion were their perceptions of climatic change. It is an interesting observation to note that, in the opinion of several brigadiers, winters had become colder over the last few years. Following this discussion, we were given reports, compiled and presented by local school children, on Chukchi culture – a subject they had been

focusing on at school. There was then a community show, presenting examples of traditional dancing and singing, performed in Chukchi dress.

Overseeing the time we spent in Kolymskoe was Pyotr Kaurgin, second in command of the obshchina Turvaargin. Pyotr was to host many of the meetings that I witnessed in his home in Kolymskoe. He also led our group during our time on the Tundra visiting the Brigades. Pyotr is a warm and open person, who has a vast knowledge of traditional Chukchi culture and reindeer herding.

Over my days spent in Kolymskoe, I was introduced to the life and issues of those living in the village. During this time, I came to understand the strong connection between the village and its inhabitants and the nomadic reindeer brigades. Families of herders live and work in the Kolymskoe village when the herders are away following the reindeer migratory routes. This journey, as mentioned earlier, takes the herders hundreds of kilometres north, to the Arctic Ocean and back. The significance of reindeer, and the intimate connection held between the reindeer and members of the community, was expressed powerfully by one of the elders - "as long as the reindeer run we are alive".

Traditional handicrafts are still practised in the Kolymskoe community, providing a vital income for those involved in it. I learnt that this practice was not only a continuation of traditional cultural activity, but was an integral part of reindeer herding life, providing one of the only sources of clothing capable of withstanding the severe arctic weather.

Over the next few days I witnessed many discussions between Maria, Pyotr and Tero regarding the solar panel project. These discussions, amongst other things, covered the issue of the size and weight of the solar panels. Pyotr expressed uncertainty to the weight and dimensions of the solar panels, depicted in the pictures sent by the Barefoot College. Pyotr said that it would be helpful to see the solar panels for real, to understand how they would fit into nomadic life. It was also essential for Maria to decide upon the solar equipment that should be sent from India. There was confusion surrounding this decision, as Maria felt the College should identify the correct equipment to send, whilst the Barefoot College felt that Maria should provide this information.

Maria, in accordance with the new framework of the pilot programme, decided that the equipment needed was as follows: 1 Mini power plant for Kolymskoe village, 1 12 V 20 WP for a chosen pilot brigade, 1 12 V 40 WP for a hunting station and 3 portable lantern lights. This information was relayed to India in order for the panels to be shipped to Kolymskoe. Maria was also unsure at this point as to whether the solar equipment would arrive already assembled, or if she would have to assemble them herself.

During my stay in Kolymskoe, I witnessed a real sense of expectation surrounding the solar panel project. Much of the community believed the panels had been promised to them at the beginning of the project, before Maria travelled to India. Mr Romanovsky, head of the obshchina Turvaargin, explained that the community had waited for the solar panels and batteries to arrive for one year and had consequently ordered less conventional batteries in the expectation that the solar equipment would arrive. Mr Romanovsky stated that all members of Turvaargin were still fully committed to the project.

We travelled out on to the Tundra to visit three different reindeer brigades, allowing a sense of the conditions the panels would face in Siberia. The first brigade we visited was Brigade 7, led by Evan. Evan expressed many prudent thoughts about how the solar panels would cope in the Tundra. His first question, however, the same as many in Kolymskoe, was when would the panels arrive. Evan believed that a pilot programme was a good idea, as it would allow the success of the panels, in coping with the conditions in the Tundra, to be assessed. Evan also expressed concerns as to how the panels would cope with travelling across the Tundra, as the type of movement they would be subject to would be different to any other that they had encountered during other projects around the world.

Much preparation had taken place in anticipation of the solar panels' arrival. Construction of a specific sled to move the solar panels across the Tundra had been completed. There had also been much experimentation with wrapping fragile objects in reindeer skins to cushion against vibration when moving. This was in the hope of guarding against the panels from breaking whilst in transition.

Mr. Pyotr Kaurgin standing next to purpose built sled for solar panels. Photo by Mika Nieminen, Snowchange 2010. (See photo gallery)

Next, we travelled on to Brigade 4, where we spent the night. Three Brigadiers joined us to share their views on the solar project so far and to outline the issues they faced in their lives. Some of the main concerns the Brigadiers expressed were: the timeframe for the implementation of the project, the material the equipment was made from – was it toxic if broken, could the solar panels be repaired if broken, were they waterproof. Maria explained to the Brigadiers the limitations of the equipment. She explained that they could not be used for heating water, which, Pyotr stated, would be a big advantage. The panels were only able to provide light.

The reindeer herders also told of the difficulties they faced in day to day survival. They explained that all of the wages they earned, around 5,000 rubles per month after tax, went on paying community services for their families in Kolymskoe. There was not any money left over at the end of the month. Food, they explained, was acquired by a combination of a herder's wife's salary and subsistence hunting and fishing.

List of common groceries and prices from shop in Kolymskoe collected by the author in 2010

1 litre of vegetable oil:	190 rubles
1 Kg of Rice:	112 rubles
1 Kg Pasta	98 rubles
100g Tea	65 rubles

The costs of running equipment on the Tundra were also discussed. For example, it takes approximately one 200 litre barrel of kerosene (60 rubles a litre) per year to run gas torches for a brigade.

There was still, at this point, an overall feeling of optimism towards the whole solar project. Many people, with whom I spoke, felt it was a positive step that would help on the path to community revitalization. Maria, however, expressed feeling great pressure, due to the panels not arriving and, thus, being unable to prove herself to the community as a solar engineer.

The next day the group visited Brigade 6, where we were witness to a reindeer herder's 50th birthday celebration. This celebration involved reindeer racing and lasso competitions, a traditional blessing ceremony and a large feast. With the excellent care afforded to me by everyone that I met from Kolymskoe and Turvaargin, even considering the daytime temperatures of -20°C and night time temperature of -30°C, I never once felt cold on the Arctic Tundra.

Reindeer racing on Tundra. Photo by Mika Nieminen, Snowchange 2010. (see photo gallery)

Following our week hosted by the Kolymskoe village and the Turvaargin obshchina, we travelled back to Cherskii, where we met Vyacheslav Kemlil, head of the Nutendli community. Vyacheslav explained that the Nutendli community were still very interested in being part of the solar project and that they wanted to work closely with Maria, and Turvaargin, to achieve this.

Also present at this meeting was Marina. Marina explained that six months after her return from India, she felt in a more sober position to reflect upon the events that had occurred whilst she was there. She felt that, at the time of travelling to India, her mental state might not have been strong enough. Upon enquiry, as to how the experience could have been better for her, Marina explained that a much more comprehensive explanation of what to expect would have helped to prepare her.

April 2010 - May 2011

After the Snowchange trip to Kolyma, I wrote a letter to Bunker Roy. The letter conveyed the message, from the Kolymskoe community, of readiness for the immediate implementation of the solar project (Appendix 3). Snowchange also approved the payment for the solar panels to be shipped from India to Russia via air cargo. Snowchange transferred € 5000 to the Barefoot College bank account for this purpose. The decision to transport the panels via air cargo was taken by those at Snowchange, along with the Northern Forum Academy. It was hoped that, by transporting the panels this way, it would speed up the execution of the much anticipated project.

The summer proceeded without the shipment of the panels from India, although correspondence did take place between the Barefoot College, Snowchange and the Northern Forum Academy, regarding the need to source the correct batteries and deep cycle cables for the solar panels, vital pieces of equipment for the solar project, in Russia. The batteries and cables could not be transported via air cargo, due to the stringent regulations surrounding the movement of corrosive materials via aircraft.

In July 2010, Bunker telephoned a member of the Indian Embassy, in Russia, to seek assistance in sourcing the correct batteries and cables for the solar panels. A member of technical staff was assigned by the Ambassador for this purpose. A six month period of correspondence then began between the Indian Embassy in Russia and the three partner organizations. This correspondence related to the exact specifications that were needed for the batteries and cables. By December 2010, the correct equipment had still not been located by the Embassy.

Tero and Vladimir both felt at this point that the equipment needed to be located and shipped to Siberia immediately. This was due to two factors: the first being that the expectations for the project in Kolymskoe were extremely high. Over a year had passed since Maria had returned home having successfully completed her training. The second was that the winter months of the Arctic Tundra would be the ideal testing ground for the solar panel project.

In early 2011, Tero once again contacted the Barefoot College to request the shipment of the solar panels from India to Russia. During this contact, Laxman informed Tero that, having already waited six months, the Indian Embassy had failed to source the correct equipment. The sourcing of the batteries and deep cycle cables, therefore, once again, became the responsibility of Snowchange and the Northern Forum Academy.

By February 2011, Tero and Vladimir felt that, without the transfer of the panels and the location of the batteries and cables, the solar project was beginning to look increasingly less likely to succeed. As a contingency plan, Tero began looking for other sources of solar equipment, to ensure the promises made to the Siberian communities could still be fulfilled.

Vladimir and his staff eventually located batteries and cables, that matched the solar panels' specifications, in Moscow and arranged their transportation to Yakutsk.

In early March 2011, Tero again contacted the Barefoot College, to ensure the transportation of the solar panels from India to Russia. He was informed that the panels had been moved the day before and were currently in Moscow, at Sheremetyevo International Airport. Tero relayed this information to both Vladimir and the Kolymkskoe community. Vladimir arranged for a cargo company to transport the panels from Moscow to Yakutsk and the community at Kolymkskoe agreed to fund the final movement of the panels from Yakutsk to Kolymkskoe.

The movement of the panels from India to Moscow was to commence a bureaucratic nightmare for all three partner organizations. This had the potential to extinguish any hope of successful completion of the project. Although the panels were now in Moscow, they had not been granted import certification by Russian customs and could not be moved from the airport.

Russian customs do not work directly with organizations that are attempting to import goods. Their system uses a third party customs broker who deals with the technicalities of imports and liaises with the two parties. The Northern Forum Academy contacted all of the available custom brokers in the Moscow area, but only one broker was willing to accept the job of arranging the import of the panels. The refusal to undertake this work by the other brokers was attributed to the lack of documentation associated with the solar panels.

Requests for documentation from the custom broker were attended to by all three partner organisations, with Vladimir taking the brunt of this work. At least 15 different technical documents were requested, ranging from translations of Hindi export documents to specifications of the panels and other components. At one point, the specifications of every single component used in the construction of the solar panels was requested. Russian customs claimed to need these, due to the panels having been made by hand in India and, therefore, not having any technical certification attributed to them on completion. Nothing could be imported into Russia without a certificate of origin.

On 20th April 2011, the custom broker involved with the project withdrew his services, stating that the lack of documentation surrounding the panels and the ever-changing requests from Russian customs had made it impossible to continue. On learning this, Tero and Vladimir contacted officials at the Finnish and Russian Embassies, in Moscow and Helsinki, to see if they could intervene. They declared they could not.

At this stage in the project, most involved felt that nothing else could be done, except to cancel all activity associated with the project and return the solar panels to India. Tero asked Vladimir to speak to the community in Kolymkskoe, to seek their approval to end the project. Elena Antipina, Pyotr Kaurgin and Mr Romonovsky gave their consent for the activity to end. The four year project appeared to be over.

In a final act, before withdrawing, the customs broker that pulled out of the project gave details of a contact, named Dmitri, to Vladimir. Dmitri worked closely with customs at Sheremetyevo International Airport, but was not himself a customs broker. Dmitri believed he could potentially arrange to get the panels into Russia. Following his initial assessment of the case, he stated that, although very complex,

this could be achieved by the certification of 15 of the panels' components, at a cost of 100 euros per certification.

The project partners felt that, having given so much of their time to this project, it was necessary to try this final option. This would leave the Snowchange Cooperative with a final cost of 4800 euros for storage and certification in Russia, if the panels were to make it to Yakutsk.

An issue, highlighted by Tero, regarding communication with India, was the slow response time (10 months) in air freighting the panels from India to Russia; also the difficulty in getting information from the Indian partners. Vladimir had sent a detailed email to India in early 2009, requesting the technical details of the panels in preparation of their shipment, for which he did not receive a reply.

The ever-changing requests of the Russian customs proved extremely difficult to negotiate, with Vladimir taking responsibility for much of this work. Tero did, however, feel that Laxman had been very supportive with many of the issues they had faced.

On 9th May 2011, almost two years after Maria completed her training, the solar project overcame the final plethora of obstacles. The panels were finally given certification of import by the Russia customs and were allowed to begin their journey to Kolymskoe.

Conclusion

Whatever the outcome of the solar panel project, it should be viewed in a wider context of change for those who have participated in it. There has been much positive transformation in the village of Kolymskoe and obshchina Turvaargin since the beginning of the Barefoot/Siberian collaboration. These changes, led by Mrs. Yelena Antipina, the head of village of Kolymskoe, Mr. Vladimir Andreevich Romanovskii, head of Turvaargin, and vice-head Mr. Pyotr Kaurgin have resulted in:

The first ever National Assembly of Chukchi Peoples in the Republic of Sakha-Yakutia, held in 2010 at the village and community of Kolymskoe (Turvaargin).

Obshchina Turvaargin receiving land use rights under the Indigenous legislation in early 2011, where their areas were declared "traditional nature use territories" of Indigenous peoples, meaning their Indigenous culture and nomadic economy will survive.

In Spring 2011, the Turvaargin community released the first ever Lower Kolyma Chukchi ABC book for use in the schools of Kolyma.

More information on these subjects can be viewed at www.eloka-arctic.org/communities/russia

Maria's and Marina's courage and sacrifice in this project has also to be recognised. Without their willingness to be involved in the six month training programme - leaving the security of home, family and friends – none of the solar power project would have been possible. Also Maria's patience has to be noted, shown by her waiting two years, after completing her training, for the solar panels to arrive and still being committed to the project.

Many of the problems of the project appear to stem from the belief of Bunker that the communities in Siberia were more affluent than he initially believed. Bunker stated that, without his ability to travel to a community himself, he relies upon the assessment of others to life and conditions there. A possible solution to these problems could be the implementation of formal financial criteria that a community would have to meet before entering into a Barefoot solar programme.

Bunker has, characteristically, shown an ability to learn and adapt to the challenges that have been presented to him. In news that has just been received from Tero, Bunker has agreed to reimburse Snowchange the 17,500 Euros that they spent on the solar panels between 2010-2011. He also agrees that, for future collaboration between the Barefoot College and other Siberian partners, the rules regarding only taking illiterate candidates for training should be reformed. Also, he hopes for long term cooperation between the Barefoot College, Snowchange and Siberian partners.

At this moment Bunker's vision is changing the lives of countless individuals. The work that is performed at the Barefoot College should be used as a guiding light for us all.

Appendix

Appendix 1.

**RUSSIAN FEDERATION, SAKHA REPUBLIC (YAKUTIA),
NIZHNEKOLYMSKY REGION, KOLYMSKOE VILLAGE,
KHALARCHINSKY NASLEG ADMINISTRATION**

LETTER OF REFERENCE

**Maria Krivoshapkina
Barefoot College (India) trainee**

Maria Dmitrievna Krivoshapkina has lived and worked in Kolymskoe village of Nizhnekolymsky region, Sakha Republic (Yakutia) since 1976. She came from Tit-Ede village of Ordzhonikidzevsky region, Sakha Republic (Yakutia).

She has for a long time worked as a light clothing maker, a pastry cook at Chersky bread-making plant, a guard at Kolymskoe secondary school and kindergarten. She has been working as an assistant to the kindergarten teacher since 2006.

reindeer herders. Maria actively participates in all the abovementioned activities. Maria has been closely cooperating with reindeer herders' brigades since 1976; she has repeatedly visited the brigades in tundra. Being a clothing maker, she made textile parkas for reindeer herders and fur shoes and warm textile mittens for hunters. Being the patronages of a reindeer brigade # 4, the kindergarten staff, of which Maria has been a member, annually prepares and sends parcels for the

Maria is a hardworking, sympathetic, responsible and kind person. After being trained at Barefoot College in India, Maria will be able to implement all works related to solar panel installing and maintaining in close cooperation with the community's reindeer herders and tent keepers.

Head of Khalarchinsky Nasleg Administration

Elena Antipina

Appendix 2.

**AGRICULTURAL PRODUCTION COOPERATIVE
TRIBAL NOMADIC COMMUNITY NUTENDLI**

LETTER OF REFERENCE

Marina Vasilievna Tatarinova

Marina Tatarinova was born on October 11, 1956 in Andryushkino village of Nizhnekolymsky region, Sakha Republic (Yakutia). She is single. She is Sakha. She has 3 children. She has specialized secondary education – a cinema operator. After an official retirement she has continued working. She started working in Nutendli Community on July 9, 2007 as a deputy head for administrative issues. On January 1, 2009 she was on her application transferred to the reindeer brigade # 1 as a tent keeper.

She is calm, energetic, tactful, punctual, thorough and communicable. She gets on well with the staff; she is polite and intellectually curious. Being a tent keeper for quite a short time, she has put forward many suggestions on the improvement of reindeer herders' and tent keepers' living conditions.

She actively participates in all the undertakings of the community. Having learned about the solar panel project, she has indicated her willingness to help the community with bringing the solar energy into its life.

Head of Nutendli Community

Vyacheslav Kemlil

Appendix 3

Email to Bunker from author after his trip to Kolymkskoe

Dear Bunker

I have recently returned from a documentation field trip to the village of Kolymkskoe in Siberia. This is the village where Maria lives. The village will hopefully act as the hub of the proposed solar power scheme. I visited the village and reindeer brigades in the area to follow on from the documentation process that I began, with the aid of you and others, at the Barefoot College last year.

After many days of meetings and informal discussions with both Maria and members of the obschina (clan or family based reindeer herding unit) Turvaargin, I have been asked to convey the message by all involved, that they are very much still committed to the program. General thoughts from the community are that if the scheme is able to work then it will be a positive step for all. Evan, a member of reindeer brigade 7, showed me and asked me to document the effort they have made towards receiving the solar panels. Attached is a photograph of a specially constructed sled designed and built by the community to house the solar equipment.

Maria has asked me to pass on her best wishes to all who were involved in her training at her time in India; she stated that she was looked after very well in both Ladakh and Tilonia. Maria has also expressed the wish that the solar equipment may arrive soon as she feels that all of her time in India undergoing the training will be wasted. She also wants to prove to the community the worth of her time spent away.

I also met with Marina to discuss her views of the training in India. The community she represents, Nutendli, suggested it is willing to work with Maria as a possible second stage implementation after the program begins with Turvaargin.

General observations of the economic situation of many of the reindeer herders are that wages are generally very low: just enough to pay for rented accommodation back at the village for their family. The cost of food products in the village is also very high. People appear to use subsistence fishing and hunting as a means to feed their family. The actual prices and cost of living was documented in detail and will be included in the final report.

Also general thoughts from many people that I spoke to were that a pilot scheme of a few solar units should be conducted before any larger scale implementation. This will allow the solar panels viability to be tested in this new harsh environment. Discussions involving Maria and other community members concluded with the wish to establish a larger solar electricity unit in the village of Kolymkskoe. Also two smaller units: to brigade number 1, which has the most distant nomadic route of the reindeer units, and a fishing and hunting base which will be situated on the tundra close to the Chukotskaya River. A list of specific equipment for this pilot scheme generated by Maria and the community has been passed to Vladimir Vasiliev, who is acting as a point of contact between the community and the Barefoot College. Feelings of most community members that I spoke to are that the pilot scheme will hopefully begin as soon as possible.

Payment of the panels was a significant issue that was also raised by community members. Impressions are that the solar panels would be donated to the community. We discussed this question with the leadership of the community, as well as Tero and Vladimir at length. Snowchange indicated its willingness to help with the costs for this pilot project if needed.

Can I apologise for the fragmented nature of this email, the situation in Siberia is very complicated and difficult to explain over a single page but I also did not want to overload you with information. As with my time in India, it was an honour and a privilege to be invited into people's homes and be allowed to witness how they live. All that I was asked in return was that I convey this message to you: that is of the commitment that everyone has to making this work. I would be very happy to phone you to discuss any of these points further if you should wish.

Kind Regards, Chris Madine