VISITING A GROUND-BREAKING REFORESTATION PROJECT IN BOLIVIA

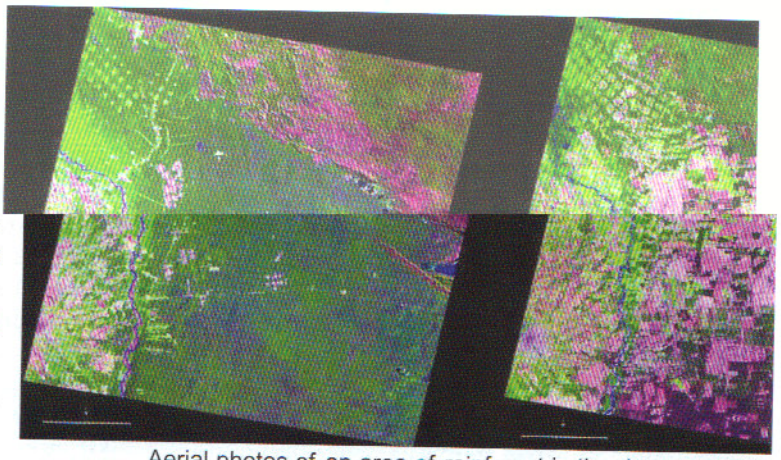
In July 2012 RFS member and retired urban forest manager from Northumberland **Steve Manchee** visited Bolivia together with nine other small investors in a truly ground-breaking reforestation project Arbolivia in the Amazon basin.

After a tour around La Paz and a visit to Lake Titicaca we took a flight to Santa Cruz, Bolivia's largest city in the Amazon Basin. It was clear looking out of the plane's windows what devastating impact farming is having on the rainforest. Although we were travelling in the Bolivian winter, in September it is often impossible to see the ground due to the fires raging in another bout of 'slash and burn' laying waste to the rainforest.

The Arbolivia Project was established in 2007 by the Sicirec Group BV a Dutch forestry company with a long experience of tropical forestry management. They in turn established Sicirec Bolivia, a company limited by guarantee, but independent from Sicirec Group BV, to manage the project on the ground. Currently Sicirec Bolivia has 32 employees and although led by Anko Stilma a Dutch forest manager, all the other staff are Bolivian. The project is a three-way partnership between the subsistence farmers (campesinos), Sicirec Bolivia and the Cochabamba Project, an Industrial & Provident Society launched in 2009 and based in the UK, that supplies the financial investment. So far £3 million has been raised mainly from 400 small investors.

This is a truly international co-operative venture in which 50% of timber sales go to the campesinos and 50% as a return to the investors. To date there are 758 farmers who have planted 1200ha of mainly indigenous rainforest tree species.

The plots are small, usually less than a hectare. The species are selected from a list of 12 species (see box overleaf), chosen following research undertaken by Sicirec Bolivia. These species are suitable for a range of sites dependent on soil depth, compaction, presence of an iron pan, acidity, risk of flooding and potential for aiding underplanting with food crops. In addition, there have been some very limited planting of an exotic teak (*Tectonia grandis*) partly because generally growth rates are very unsatisfactory and because it creates a dense shade it is unsuitable for intercropping. Equally it is unusual to plant very valuable species like



Aerial photos of an area of rainforest in the department of Cochabamba, 1995 on left and 2005 on right.

List of 12 species used in plantations.

Jichiturqui	(*Aspidosperma macrocarpon*)
Verdolago Negro {pepa}	(*Buchenavia oxycarpa*)
Palo Maria	(*Calophyllum brasiliense*)
Tejeyeque	(*Centrolobium tomentosum*)
Almendrillo	(*Dipteryx odorata*)
Trompillo de altura	(*Guarea rusby*)
Serebo	(*Schyzolobium amazonicum*)
Palo yugo	(*Stryphnodendron purpureum*)
Palo roman	(*Tapirira guianensis*)
Verdolago negro {de ala}	(*Terminalia amazonica*)
Verdolago Amarillo de ala	(*Terminalia oblonga*)

2,000 planted plots are owned by individual smallholders. Once they have proved title to the land the advisers suggest a range of suitable species based on detailed soil sampling, ground vegetation analysis and what, if any, food crop the farmer wishes to include. A contract is drawn up and a schedule of weeding and pruning agreed. The farmer will receive annual payments during the establishment phase. The other key

Tejeyeque P2010 regrowth after being burnt.
Anko Stilma can be seen centre is in the blue shirt.

the trees are pruned on three separate occasions at 1.25m, 4m and finally at 8m.

On 18th we visited farmer Juan Jira Colque in the Santa Fe de Amboro co-operative. He had a 1ha plot of P2010 tejeyeque that had been partially burnt at the end of the first year, but because of its strong coppicing capacity had already regrown and was now 2m high. In addition it had been interplanted with beans, which will help prevent fire damage in the future whilst increasing the farmer's income. Tejeyeque is one the most successful species, a medium fast growing legume that matures in 25 years and is deciduous. Used for furniture and panelling with a red/orange colour, it produces viable seed in seven years and also produces strong coppice shoots and on suitable soils strong natural regeneration.

Our second stop was with farmer Jacinta Ramos de Herrera who had two species on her 1ha plot both P2010. Because part of the site was adjacent to a small stream a flooding-tolerant species palo maria had been used on 0.7ha with tejeyeque on the rest.

The next day, the 19th, we visited Emilliana Guayagua in the Naranjal co-operative. She had 2.5ha including tejeyeque (1ha), verdolago (0.5ha) and unusually 1ha of teca (teak). All planted in 2008, it was clear that the indigenous species had grown much better than the teak. The tejeyeque had been inter-planted with bananas and yuca (cassava); the bananas and yuca will die out next year when the tejeyeque's canopy closes. She was considering planting serebo, a very fast growing species ideal for clay soils with good form, but so far not used very often.

Our next visit was to the regional offices of Siriec Bolivia in San Carlos where we were shown the detailed records that show the contracts with farmers, species planted, maintenance operations, family numbers, including those working on plots and any peones (labourers) employed. It was explained that apart from the purely forestry and agricultural assistance a range of social supports were offered including microfinance, education and capacity building, employment especially seasonal work in their plant nurseries.

6m high verdolago P2008, under-planted with pig nuts.

Palo maria seeds being sown in pots.

Our next visit was to cattle farmer Isidro Colque Condo, who has planted an evergreen species, verdolago negro (P2008), that will grow to 30m, at 3x4m centres. It is currently over 6m high and has had two prunings. There was a problem with leaf cutter ants that totally defoliated the trees, however this had been addressed by under-planting with pig nuts, which contain a substance toxic to the ants, but not to the cattle for whom this fodder crop was intended. Verdolago negro grows to 30m, and is used for furniture, flooring, veneers and construction.

We moved onto Ezequiel Salvatierra Hurtado from the El Cairo Co-operative who had 1.1ha of P2008 tejeyeque planted at 3x3m centres, which had been pruned to 4m and will receive a first thinning in 2013 when 25% of the crop will be removed. The plot had been under planted with yuca.

Then onto Julio Zabala Rojas of the Valle Hermoso Co-operative with 1ha of palo maria (P2008) on a wet site. This evergreen will reach 30m at maturity and is used for canoes, ships masts, construction, flooring and general joinery. He also had 1.2ha of palo roman (P2008) planted at 3x4m centres and under planted with mangos at 10m centres. Palo roman reaches maturity in 18 years at a height of 35m, and is another evergreen, with reddish brown timber used for internal cladding, furniture, doors and windows.

Finally we visited the regional nursery at San Carlos, which can produce 27,000 plants annually. They collect seeds from designated seed trees; we saw palo maria seeds (which look a little like a broad beans) being planted in a special mixture containing guano, black sand, lime and rice husks. The seeds can be sprouted in 12-15 days, under a black mesh. The seed need a pre-germination treatment: Firstly the green cover has to be removed by soaking in water for three days, then the seed is dried for five days, soaked in water with an added organic fungicide for 4-5 hours prior to being sown.

On the 20th we visited Eduardo Choque Munos, who we learnt had come from Potosi, the tin mining area in 1983. He bought his 30ha smallholding in 1990 and decided to plant coffee in 2005. Finally having talked to his neighbours he applied to join the ArBolivia project in 2008. He has now planted 0.9ha of palo roman (P2008), 0.6ha of trompillo (P2008) and 0.6ha of tejeyeque (P2011). All the trees have been planted at 2.5x5m to allow him to interplant with coffee, mandarin and bananas. Trompillo de altura likes a well-drained soil in a humid microclimate, is evergreen with a maximum height of 45m and maximum BHD of 1m. It is self-pruning, with a small crown, and so ideal for growing coffee underneath. It will be felled when it reaches BHD of 0.4m, producing a semi-hard timber for furniture. Its only drawback is its very slow growth in the first two years, necessitating extra weeding.

We had a break from bumping along over dirt roads on the 21st and headed for the Amboro National Park, a large area of pristine rainforest where the only accommodation is in fairly primitive 'eco lodges' with no electricity. Even this supposedly secure area has suffered some deforestation, so further emphasising the urgent

need for the Arbolivia Project.

On the 23rd we were back on the road visiting the first trial plots created in 2007 by Sicirec Bolivia and funded by FAO. The reason for our visit was to see a Wood-Mizer in action planking five year old Serebo. It was purchased second-hand for $15,000 and is 10 years old. The aim is to add value to the early thinnings by making interior cladding, and Sicirec Bolivia have already concluded an agreement with a large timber manufacturer in Santa Cruz. A salesman will be appointed to explore the potential markets for thinnings.

Our final visit was to Emigdio Laura Rodriguez of the Villa Cristal co-operative, our only visit in the Department of Cochabamba. He had a 1ha plot of P2010 palo roman interplanted with palmetto, which will last for 15 years before being shaded out. This site was the most degraded we saw, the soil was very acid as it had been used to grow coca.

My most abiding memory of this wonderful trip was of hope for the future, or as the wife of a farmer we met weeding her plot replied when asked why she joined the project: "We are doing this for my grandchildren to give them a future."

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Further information can be obtained from www.cochabamba.coop & www.arbolivia.org

The Wood-Mizer cutting 5 year old serebo.