Biochar Production
at Dolakha, Nepal, December 2014
General remarks

• 3 different kiln types were installed at the Hill Crop Research Station, Dalakha
• 2.5 m3 of biochar was produced
• 2 types of biochar were used for two scientific and nine farmer trials
• 250 l of biochar-compost was prepared for the continuation of the scientific field trial
• 1 Kon-Agno kiln was built with local farmers in the nearby village
Igniting the metal kiln (Kon-Tiki) and the soil pit kiln (Kon-Agno) works the same
Kon-Tiki and Kon-Agno Biochar Kiln in the starting phase of pyrolysis
building up the pyrolysis front with more energy rich feedstock
using some more bamboo in the beginning
clean vortex combustion of pyrolysis gases
building of the pyrolysis layers
corn cobs are excellent biochar feedstock
two kilns running parallel
soil quenching of the soil pit kiln
homogenizing the pyrolysis layer
close to the end layer
end of pyrolysis in the pit kiln
a Kon-Tiki full of quenched biochar
A m3 of biochar in the Kon-Tiki
Digging out of the biochar from the soil kiln
800 l of biochar mixed with some clay in the soil pit kiln
quench water can be used as shampoo or leave fertilizer
chared corn cobs
transporting the biochar to the site
manual grinding of the biochar
manual grinding
fine grinding with stones
a mill will be built for the next sites
Mixed metal –soil pit kiln
an economic highly performant kiln type
very clean combustion dynamic
thanks to the heat reflection of the metal cone shield and the insulation of the clay-pit high and homogenous temperatures in the pyrolysis layer
final pyrolysis layer
Biochar Production
at Parwanipur (Terai), Nepal, January 2015
General remarks

• The full scale Kon-Tiki and the metal-soil (Kon-Agno) kiln were installed at NARC research station in Parwanipur (Terai).

• 1.5 m3 of biochar was produced

• The 2 types of biochar were used for two scientific (onions and maize) and six farmer trials (onions)
The wood for igniting was freshly cut and thus very humid
it took thus some more time to get into pyrolysis mode
both kilns were fired simultaneously
finally the necessary heat was attained to start pyrolysing rice husks
view into the earthen bottom of the metal-soil kiln
building of the pyrolysis layers
building of the pyrolysis layers
rice husks and sugar cane are excellent biochar feedstock when blended in the right proportion and timing with more bulky and energy rich feedstock like wood (needs experienced char maker !)
2 m3 of rice husks were pyrolysed
see the rice husk heap in the background which was reduced by more than half (> 2 m3) with one run of the two kilns
two kilns running parallel
close to the end layer
water quenching of the Kon-Tiki
a Kon-Tiki full of quenched biochar
soil quenching of the soil pit kiln
A m3 of biochar in the Kon-Tiki
clean combustion dynamic
Biochar Production at Panchkhal (Kabre), Nepal, January 2015
General remarks

• The full scale Kon-Tiki and the metal-soil (Kon-Agno) kiln were installed at Spices Crop Development Center in Panchkhal (Kabre).

• 800 l of biochar was produced from saw mill waste

• The biochar were used to test different nutrient charging techniques for a scientific field trial with ginger.

• The biochar was further used for a farmer trial with urin enriched biochar as fertilizer for ginger
Saw mill waste was used as feedstock. It was very humid (4000 NRP / t)
transport of feestock to the site
... and Kon-Tiki were fired simultaneously
due to humidity and the bulky wood material the pyrolysis took the whole day
view into the Kon-Tiki kiln
finishing of Kon-Agno
using the hot char for improved nutrient charging
blackening scientist’s work
Need for manual mills
finally a mill that works without electricity
Installation of Kon Agno in Coffe Farm
Emission tests with Gerard Cornelissen
testing different designs