PRO-NATURA INTERNATIONAL
Innovation towards Sustainable Development
Member of IUCN, the International Union for Conservation of Nature

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USING BIOCHAR TO FEED THE GLOBAL SOUTH WHILE MITIGATING CLIMATE CHANGE

Innovation has always been part of Pro-Natura's DNA. The flying devices and inflatable platforms we use to explore the biodiversity of the world's rain forests have made the pages of the New York Times Magazine. However, our **Super Vegetable Gardens** (SVGs), especially the ones that grow in desert sand, are a special source of pride.

SVGs are a spectacularly effective, water-stingy way to grow food- sometimes as much as 100 tons per hectare per year- even when the outside temperature reaches 50° C (120° F).

How do we do it? Partly by combining an ancient **Amazonian Amerindian technique** called biochar with other innovations, in particular coming from JTS Concept.

Biochar (a form of ecological charcoal) has been called **"The Third Green Revolution"**. When used in fine granular form (less than 2 mm) and combined with organic fertilizers like camel or cow dung, it can be applied to different soil types across a variety of climatic conditions. The poorer the soils, the more the effect of biochar is spectacular.

Our experience in tropical areas has shown that a single application of approximately 10 tonnes per hectare can **increase crop productivity to levels that range from 50 to 200%.** Just one application provides and maintains long-lasting soil fertility benefits that enhance carbon sequestration in the soil, thus fighting climate change.

Today, biochar research shows measurable, replicable improvements in soil productivity:

- Enhances the soil biological activity (40% increase in mycorrhizal fungi)[1]
- Improves nutrient retention in soils (50% increase in Cation Exchange Capacity)[2]
- Improves the water retention capacity of soils (up to 18% increase)[3]
- In terms of carbon sequestration, 1 tonne of biochar is equivalent to 2.7 tonnes of CO_2
- Increases the pH of acidic soils (1 point pH increase)[4]
- Increases soil organic matter[5]

Most biochar-related activity is linked to the International Biochar Initiative based at Cornell University *www.biochar-international.org*

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[1] **Lehmann, J. and Joseph, S. (eds) (2009) Biochar for Environmental Management. Earthscan: London.**

[2] **Warnock, D.D., Lehmann, J., Kuyper, T.W. & Rilig, M.C. (2007) Mycorrhizal responses to biochar in soil – concepts and mechanisms. Plant Soil (2007) 300:9–20**

[3] **Glaser, B., Lehmann, J. and Zech, W. (2002) Ameliorating physical and chemical properties of highly weathered soils in the tropics with charcoal - a review, Biology and Fertility of Soils 35, 219-230.**

[4] **bid**

[5] **Lehmann J. and Rondon M. (2006) Bio-char soil management on highly weathered soils in the humid tropics. In Uphoff, N. (ed.) *Biological Approaches to Sustainable Soil Systems*. CRC Press, Boca Raton, FL, USA. pp. 517-530**

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Our "biochar-powered" Super Vegetable Gardens

Pro-Natura International is using a combination of biochar and other innovative techniques in SVG growing in the following areas:

Algeria: Hassi Messaoud Region "the oil capital of Algeria" - 900 km South East of Algiers (funded by Sodexo). Mostaganem Algeria with the Foundation Djanatu-El–Arif.

Brazil/Guyana: Project on both sides of the border between Guyana and the State of Amapa in Brasil (funded by Cartier and the French Guiana Natural Park).

Rio de Janeiro: mini SVGs grown on the rooftops of the Mata Machado favela (funded by the GDF Suez Foundation).

Burkina Faso: The Central Plateau 150 km East of Ouagadougou (funded by Caritas Alsace) will be shortly expanded through a donation from BNP Paribas's Orangerie Foundation.

France: Bar-sur-Loup near Nice with the French Muslim Scouts.

Ghana: Pilot agroforestry and SVG project (funded by the Air Liquide Foundation and the University of Ghana).

Haiti: SVG and Agroforestry pilot training project with Vetiver growers, Southern Haiti (funded by Firmenich). Agroforestry training, rural and urban SVGs in Port au Prince and on the Central Plateau (funded by the EDF Foundation).

Ivory Coast: Pilot agroforestry and SVG project (funded by the Air Liquide Foundation).

Mauritania: Region of Trarza at 164 km South and South East of Nouakchott (funded by FIDA).

Nigeria: Pilot agroforestry and SVG project around the A.P. Leventis Ornithological Research Institute near Jos (funded by the Leventis Foundation and the Embassy of France in Nigeria).

Senegal: at Dagana, 400 km North of Dakar near the frontier with Mauritania (funded by the Belgian Durabilis Foundation).

Tanzania: Region 700 km West of Dar Es Salam, near the Mozambique boarder (funded by Sodexo).

Chad: Batha Region 700 km East of N'Djamena, 300 km from Sudan boarder (funded by the BNP Paribas Fondation l'Orangerie).

Most biochar-related activities are linked to Cornell University's International Biochar Initiative *www.biochar-international.org*

For an informative introduction to the history of biochar see the BBC documentary, "*The search for Eldorado*": http://www.youtube.com/watch?v=0Os-ujelkgw

For more information about our work: www.pronatura.org

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