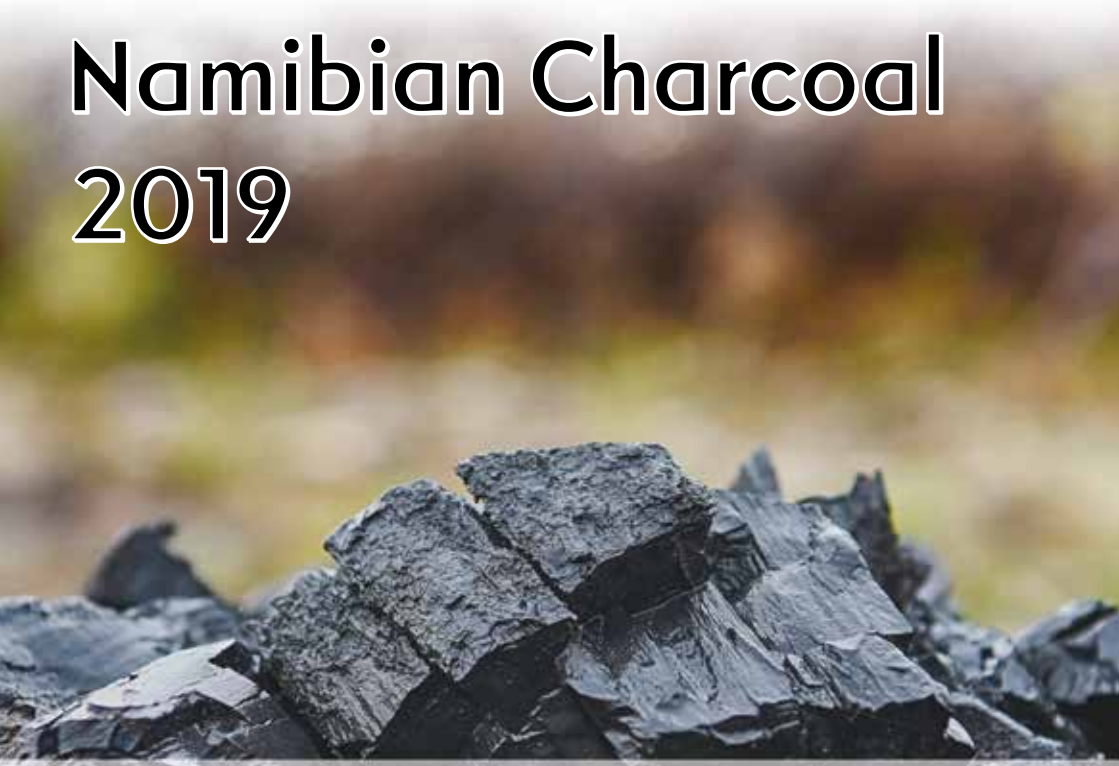
Namibia Charcoal Association

Wood Charcoal

Good Practices for Namibian Charcoal 2019



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Foreword

The booklet is published as part of an intervention identified for the Industry Growth Strategy of Wood Charcoal.

We hereby acknowledge the input of Mr Frank Detering from Carbo Namibia. Frank contributed largely to the content of this booklet.

In 2009 Frank started his career in the charcoal industry. The first two years he managed the Carbo Charcoal Processing Plants in Grootfontein and Tsumeb.

Frank is currently the **FSC® (Forest Stewardship Council) Manager of Carbo Namibia**. He obtained FSC® certification for Carbo in 2011 for the Forest Management Group Scheme and became the **Chain of Custody official** for the processing plant/factory.

In cooperation with Mr Danie van Vuuren of the NAU (Namibia Agricultural Union), he was instrumental in the transition of the NHPV (Namibian Charcoal Producers Association) to the present NCA (Namibia Charcoal Association). He also contributed to the development of the template for collecting membership fees from suppliers via charcoal processors & agents. Frank supported the newly established NCA with all applicable FSC® & charcoal supplier and processor challenges.

Besides Carbo's engagement in processing regular & FSC® charcoal in the north-eastern and northern parts of Namibia over the past 13 years, for the European export market (98% of turn-over is exported abroad), Carbo Namibia also maintained and expanded appropriate social responsibility towards the upcoming commercial farmers, supplying extension & training aid, accommodating these farmers (more than half of its members) in the FSC® Group Scheme since the start of certification.

Before Frank became involved in the charcoal processing industry, he spent 25 years in various agricultural industries. This included agricultural extension services of the Namibian Government; commercial & stud cattle breeding; trophy hunting; retail butchery; irrigation schemes for citrus orchard &vegetables; maize crops; wheat crops; Lucerne plantations; dairy farm management & dry-land agronomy.

Getting Started

"Forest management shall conserve biological diversity and its associated values, water resources, soils, and unique and fragile ecosystems and landscapes, and, by doing so, maintain the ecological functions and the integrity of the forest."

There are a couple of things that need to be in place before a person can start with the bush harvesting and charcoal production. The following is a list of activities that need to be in place:

- Forestry Harvesting & Marketing Permit must be issued. The permit is only valid for 3 months.
- Charcoal producer must have legal access to the production area. (This can be in the form of a rental or lease agreement specifically stating that the production of charcoal is allowed).
- Neighbours are informed of charcoal production and communication system is in place to report veld fires and medical emergencies.
- Contract in place for all workers, including:
    - Social Security and Workmen's Compensation has been arranged, even if workers are only working for 1 week. Workers must be registered immediately.
    - All workers are trained (harvesting procedures; wood types as specified on permit).
    - First Aid training concluded and First Aid helpers identified.
- Proper facilities are available for workers. These include accommodation, ablution facilities, cooking facilities. Please refer to Appendix A for a checklist containing detailed information on accommodation.
- A bush/tree count and vegetation composition survey has been conducted, containing encroacher bushes/trees, protected species, fodder & non-targeted species.

Getting Started continued ...

- A farm map is available (including all environmental areas, sites and locations).
- Charcoal production areas are photographed and GPS coordinates are recorded.
- Roads are maintained for easy access to charcoal production area.
- Fire prevention equipment is in place and workers are trained.
    - Effective fire breaks around camp & border fences.
    - An area of 5 m cleared around each kiln.
    - Fire-fighting equipment ready – fire slashers at charcoal site, village & homestead; mobile fire-fighters filled up and on stand-by.
    - After-care of extinguished areas, smouldering pieces on the brim of fire line, wind intensity & direction taken into consideration.
- Adhere to environmental rules not to disturb the natural habitat of protected species and controlling soil erosion.

Harvesting Practices

... to promote the sustainable management of the environment and the use of natural resources by establishing principles for decision making on matters affecting the environment; ... (Extract from the Environmental Management Act, Act No. 7, 2007)

- Apply patch or mosaic-type of harvesting.
    - This avoids a mono-diversity of encroacher vegetation, and keeps some of the original biodiversity composition.
- Ensure that the harvesting/management plan is strictly followed.
- Adhere to all forestry legal diameter limits (25 mm - 180 mm). The 180 mm refers to the bottom of the stem, in the middle of the bush it might be 150 mm.

- Do not harvest edible fodder bush, e.g. *Catophractes alexandri* (Gabbabos, Omukaravize, !khabab), *Tarchonanthus camphoratus* (Wild camphor, Vaalbos, Kamferbos, Omuteatupa), *Grewia flava* (Velvet raisin, Rosyntjiebos, Omuvapu).
- Do not harvest common species protected by Namibian legislation/ Forestry. (Please refer to sheet containing information on protected species.)
- Once harvested, wood is allowed to dry for at least 2 weeks.
- Wood is packed in organised fashion, equal length and width together; bigger pieces separated from smaller pieces.
- Multi-stemmed harvesting as indicated on permit. Should big tree/ bush species have two or more trunks/stems, take one or two stems that a less than 180 mm, and leave the rest of the tree.
- Twigs & branches less than 25 mm must be left in the veld as mulch and to act as agent to prevent soil erosion.
- Monitoring to be done six months after the initial harvesting, repeated thereafter every six months, preferably during the rainy season and the dry season (July – October), comparing the various encroachers' regrowth rate over time and season, specific species, rainfall and soil types, also keeping in mind the after-care practices of the owner/ farmer in terms of browsing by livestock/game, applying chemicals or controlled veld fires.

Species to be harvested

Encroacher bush is a threat for our rangelands and utmost care must be taken to compile a harvesting plan to support the thinning process. Always keep in mind that even encroacher bush plays an important role in the biodiversity of the rangeland and should not be totally eradicated. Observe the guidelines provided to support the harvesting plan.

Acacia erubscens	Blue Thorn, Geelhaak or Blohaak, Omunkono, Omungongomui
Acacia luederitzii (Vachellia luederitzii)	False Umbrella Thorn, Kalahari Acacia, Baster-haak-en-steek, Omungondo, Omutyuula
Acacia mellifera (Senegalia mellifera)	Black Thorn, Swarthaak, Omunkono, Omusaona
Acacia reficiens (Vachellia reficiens)	Red Umbrella Thorn · Rooihaak · Omutsiyatsi · Omungondo
Acacia fleckii (Senegalia cinerea)	Plate Thorn, Sand-veld Acacia, Wit-/Sand-haak, Omutaurambuku andjamba, Omumang
Acacia nolitica (Vachellia nilotica)	Scented-pod acacia · Lekkerruikpeul · Omutyuula · Olufu
Catophractes alexandri	Trumpet thorn, Gabbabos, Omukaravezi, Okalyanzi
Colophospermum mopane	Mopane · Mopani · Omusati · Omutati
Dichrostachys cinerea	Sickle-bush, Sekelbos, Ongete, Omutjete, Kalahari Christmas Tree
Prosopis spp.	Prosopis/Mesquite
Rhigozum trichotomum	Three-thorn · Driedoring · Okatakambindu
Terminalia prunioides	Purple-pod Terminalia, Deurmekaarbos, Omuhama
Terminalia sericea	Silver Cluster-leaf, Sand-Geelhout, Mugaro-Omugolo, Omusejasetu

Protected Species

The bush thinning process may sometimes include specific protected species to be harvested. These must at all times be specifically included on the harvesting permit. Charcoal workers can also be fined should they harvest protected species, however, ensure that this is stipulated in the contract of employment.

Acacia erioloba	Camelthorn, Kameeldoring, Omumbonde, Ghuntu
Burkea africana	Wild Seringa, Wilde Sering, Omutundungu, Mutundungu
Boscia albitrunca	Shepherd Tree, Witgatboom, Omutendereti, Unkundi
Combretum imberbe	Leadwood, Hardekool, Omumborombonga, Munyondo
Combretum apiculatum	Kudu-bush, Koedoebos, Omumbuti, Kalanga
Ficus species	Wild Fig, Wilde Vy, Omukuyu, Uhoro
Lonchocarpus nelsii	Apple-leaf, Appelblaar, Omupanda, Mupanda/Mokolo
Peltophorum africana	African Wattle, Huilboom, Omuparara/--lala, Muparara
Ptercarpus angolensis	Transvaal Teak, Dolfhout, Omuhuva, Oguva
Ricinodendron rautanenii	Manketti, Manghetti, Omunkete, Ngongo
Sclerocarya birrea	Marula, Maroela, Omukando-Ongongo, Uwomgo
Spirostachys africana	Tamboti, Tamboetie, Orupapa,Mushongo
Strychnos species	Monkey Orange, Suurklapper, Omusu, Uguni
Ximenia species	Sourplum, Suurpruim, Omuninga, Kakukuru
Ziziphus mucronata	Buffalo Thorn, Blinkblaar wag-'n-bietjie, Omukaru, Omukekete

Production Practices

Harvesting of encroacher bush is expected to increase dramatically in Namibia, with support for bush thinning and biomass utilisation coming from government, donors and commercial institutions. Bush-thinning operations need to be carried out carefully, to avoid causing environmental harm.

- Use an axe and a panga (slasher) to harvest wood.
- Separate wet and dry wood, thick and thinner wood as well as lighter and heavier wood.
- As soon as you have gathered 600 - 800 kg of wood the combustion process can start.
- Gather dry thinner wood to start a kiln fire.
- Start small fire and put the kiln at an angle over fire to ensure enough ventilation.
- Once the kiln starter fire burns properly, prepare at least 8 air inlets spread around the base of the kiln in the ground where the kiln will stand on the ground.
- Lower kiln level onto the ground over the fire and surrounding inlets.
- Add pieces of the thinner dry wood to increase the kiln starter fire. (This wood will be burned to ash to carbonise the rest of the wood.)
- When the fire is big enough in the base of the kiln on the ground, start adding the heavier, thicker and wetter wood that will not burn out too fast.
- Without crushing the fire at the bottom, the wood can be pushed in deeper with a long branch to ensure the wood is tightly packed and the maximum amount of wood gets into the kiln.
- No wood should protrude or burn out at the top of the kiln and the lid should be kept next to the opening where it can be easily accessed to

control the kiln heat and close off the fire in case of a strong wind that could lead to a veld fire in the surroundings.

- Let the kiln burn/smoulder with the lid open slightly with a stick under it so that the wood can drop, as burning proceeds. You would only do this if you are still adding wood to the kiln.
- Top up the kiln with the last bits of thinner, dryer and lighter wood that do not need a lot of burning/smouldering.
- The kiln lids are closed off and sealed between 3 to 7 hours after starting. The longer a kiln burns before it is closed off, the more charcoal it produces, but more wood is burned to ash.
- Close some of the inlets at the bottom or the lid at the top of the kiln to reduce the fire intensity so that the wood does not burn out too fast or open the inlets slightly, to increase the fire, if it is too cold.
- Kilns closed off in 3 hours' time can be opened the following day but those burned for 7 hours or more can take up to 3 days to cool down.
- Assess the kiln heat by touching the outside with the outer hand; taking care not to burn your hand. Ensure the heat is spread evenly to all sides of the kiln by opening or closing the inlets at the bottom with loose sand.
- The kiln should be supervised until it is sealed to prevent the spreading of veld fires.
- Do not open the kiln before it has properly cooled down.
- When kilns are opened the charcoal is raked into a more open circle to air it, and cooled down completely for **at least 72 hours** before it is packed in bags, ready to be sent to processors for further packaging or distribution.
- Charcoal is then separated from sand & ash by sieving it with a sand sieve, thereafter it can be sieved again with a 20/25 mm sieve, to remove the fines/fine charcoal. The last step is often undertaken by processors.

Valuable hints to improve the quality of the charcoal:

- When the wood is wet, meaning freshly harvested, chop the wood into 20 cm pieces. This will provide bigger pieces of charcoal as the water will evaporate at the ends of the pieces and won't crack in the middle of the wood.
- Allow the wood to dry for at least 4 weeks. This will burn the coal much faster. This also means that due to the decreased amount of moisture, less smoke will be emitted, making the burning process more environmentally friendly.
- Sort the wood pieces into more or less equal lengths and widths, do not mix big stumps with thin branches as the thin branches will burn to ash before the bigger pieces are charred properly.
- Start to invest in retorts, as they provide a faster and cleaner burning process and provide an overall better quality charcoal!

Dispatch / Transportation Practices

The distribution phase, i.e. packaging, loading and transport of the charcoal from the kiln to the point of wholesale distribution or large scale industrial use, can represent up to 25% of the total production cost.

- The bagged charcoal is removed from the production site by means of a tractor/trailer or truck to the central loading point, reloading onto trucks to be off-loaded/marketed at the preferred processor.
- The original production area is monitored regularly by the Forest Stewardship Council (FSC®) Official having initially established "Fixed Photo Points" and GPS coordinates for future assessments of the following:
    - The charcoal extraction roads must recover gradually to the natural state.

- The re-growth rate of the harvested encroachers.
- The overall recovering of the vegetation and re-establishing of annual and perennial veld grass pastures.

Administration Practices

Taking care of the charcoal workers will ensure good relationship over many years, which in turn will lead to better quality and enhanced production of charcoal. Favourable socio-economic conditions will enhance the working climate.

- Proper ablution and shower facilities must be provided at the camp site for both male and female workers.
- Proper housing using at least steel/corrugated iron structures should be made available; PVC structures should be avoided at all times.
- Shop facilities at the premises – allow workers to buy on credit, should be properly documented and reflected as a deduction on the remuneration sheet.
- Monthly visit/transport to nearest town should be made available.
- Protective clothing to be provided, deposit can be charged when workers start their duty. This deposit can be forfeited if charcoal worker terminates his service before the end of the agreed period. This must be stipulated on the contract of employment.
- Do not forget the SSC and Workmen's Compensation deductions and payments.

Aftercare

Restoring the rangelands by harvesting the invader bush only makes sense when an aftercare programme is launched with the bush control. If aftercare is neglected it can lead to much regrowth and re-infestation worse than before.

The main objective of an aftercare programme should be to prevent the infant bush to flower and produce more seeds.

The following programmes could be used to apply aftercare:

Chemical control: There are different types of herbicides that can be applied. If the chemical control is followed by controlled veld fire or browsing through goats and game, good results can be achieved.

Biological control: Introducing browsers, e.g. goats and game can control the regrowth, but other methods should be used in conjunction with the animals, e.g. controlled veld fires and felling/stumping. Be careful to use goats in areas with an abundance of Senegalia mellifera, Dichrostachys cinerea and Prosopis as goats can play a major role in distributing the seeds.

Controlled veld fires can be successful in combating regrowth, however in many instances it can lead to uncontrolled fires destroying many hectares of rangeland. Utmost care must be taken when this method is chosen; neighbours must be informed and only very small areas should be targeted to minimise the risk of fires becoming uncontrolled.

For more information on aftercare please visit the Debushing Advisory website, www.dasnamibia.org. This website has important information on bush control.

Health and Safety Practices

The process of making charcoal is ancient, with archaeological evidence of charcoal production going back about 30,000 years. Because charcoal burns hotter, cleaner, and more evenly than wood, it was used by smelters for melting iron ore in blast furnaces, and blacksmiths who formed and shaped steel. In the Namibian context it is mainly used for barbecues, nationally and internationally.

- Clean drinking water, via a separate storage tank, should always be available.
- First Aid kit always available at charcoal site to treat minor injuries.
- In the event of a major injury, worker must first be stabilised at site and then swiftly transported to nearest clinic or hospital at the expense of the owner/rental person in charge.
- At least one charcoal worker must receive first aid training and be available in the charcoal area at all times to assist with minor injuries.
- Safety wear, including boots, gloves, protective glasses, overall and mouth dust protector must be issued when workers commence their duty.
- Central collecting point in village for all domestic & other refuse, regularly removed to appropriate and fenced-off refuse dump.

Remuneration Practices

The process of making charcoal is ancient, with archaeological evidence of charcoal production going back about 30,000 years. Because charcoal burns hotter, cleaner, and more evenly than wood, it was used by smelters for melting iron ore in blast furnaces, and blacksmiths who formed and shaped steel. In the Namibian context it is mainly used for barbecues, nationally and internationally.

- Each charcoal worker is allocated to a specific area in the charcoal production field. This area has to be harvested within his own time frame, ability and productivity. This means that the charcoal worker can arrange his own working hours, working days, as well as leave and off-days.
- Factors like Social Security, Workmen's Compensation have to be accommodated when the remuneration is calculated.
- Remuneration is agreed upon upfront when the contractual agreement is signed, and is calculated on an amount per ton charcoal produced and delivered.
- Taking all the factors into consideration it is a good practice to pay the charcoal worker **42% of the selling price of charcoal**. For example, if a processor pays N$1,800 per tonne, then the charcoal worker should receive 42% of the N$1,800, which amounts to N$756 per tonne.

Appendix A: Basic checklist for FSC® Forest Management requirements in Namibia

* This checklist is intended for a basic understanding of the FSC® requirements in Namibia. Environmental Compliance Consultancy (ECC) cannot be held liable for your interpretation of the information contained herein.

* This checklist is intended as a self-assessment to allow farmers/ organisations the opportunity to prepare for certification. This checklist will not suffice as an auditor's checklist.

ENVIRONMENTAL COMPLIANCE CONSULTANCY

Environmental Compliance Consultancy (ECC) is a proudly Namibian owned and operated business. ECC works with their clients to develop sustainable, practical and ethical solutions to environmental challenges.

ECC provides the biomass industry with the following services:

- Applications for Environmental Clearance Certificates
- Developing and implementing farm and site-specific management plans
- Provide advisory services and assistance for Forestry permit applications
- Conduct Environmental Impact Assessments (EIAs)
- Conduct environmental monitoring (rangeland, water and soil)
- Provide Geographic Information System (GIS) and remote sensing services
- Conduct risk assessments.

Area	Basic Requirements	Yes	No
Labour	Employment contracts are signed.		
	Namibian minimum wage (approximate NAD 800 per tonne and a minimum of 2 tonnes per month) principles are applied		
	Records are kept of all salaries paid.		
	The farm/organisation and workers are registered, and the producer is in good standing with the Social Security Commission		
	Incidents, accidents, grievances and complaints are recorded and maintained.		
Safety	Training on safety, harvesting techniques and charcoal production is conducted on a regular basis. Proof of training is maintained.		
	Personal Protective Equipment (PPE) is supplied or issued to the workers (records are kept). Manual Harvesting PPE: • Overall, gumboots, hat Burning Charcoal PPE: • Dust mask, gloves, gumboots, overall, hat Stacking/loading charcoal PPE: • Gumboots, overall, gloves, hat, dust mask Certified First Aid worker are present on site at all times (one person per team)		
	Certified First Aid worker are in possession of a basic first aid kit. First Aid Kit contains the following: • Triangular bandage, bandages, adhesive tape, scissors, disinfectant and gloves		

Area	Basic Requirements	Yes	No
Accommodation	Brick, traditional, wood, corrugated or canvas tents (temporary) with not more than 6 persons per room/unit. No plastic is used as a shelter.		
	One (1) toilet per fifteen (15) people. Long drop as a minimum requirement. Suitably covered for privacy.		
	Washing area, suitably covered for privacy. Bucket system as a minimum. Elevated area to stand on to avoid standing in the mud.		
	Roofed area for cooking, sheltering people from elements such as rain and sun.		
	Potable drinking water on site and at the accommodation.		
	Waste disposal facilities.		
Conservation	10% of the farm remains untouched as a Wild Life Protection Area.		
	All rare, threatened and endangered species are recorded when sighted.		
	No excessive clearing of the whole farm (poaching strips adjacent to high risk areas are permitted, as long as they are approved by the department of Forestry.		
	Areas cleared completely for grass production do not exceed more than 5% of the farm area or they are excluded from the farm certified area.		
	Fire Management Plan is available and maintained on the farm.		
	Prevention and control of poaching.		
	Prevention and control of illegal settlement.		
	Prevention and control of illegal harvesting of trees.		
	No harvesting near rivers (100 meters), pans or termite mounds.		

Area	Basic Requirements	Yes	No
Harvesting	Harvesting of correct species as per harvesting permit: • Only species that are listed on the harvesting permit are harvested.		
	Trees wider than 18 cm are not targeted.		
	Selective harvesting techniques are applied – "Take one and leave one".		
	Not all trees of the same height are harvested, a few are left in between.		
	A mosaic approach is preferred (thinned out patches only).		
Permits	Valid Harvesting and Marketing permits are available on the farm. Permits are issued for the actual species harvested on the farm.		
	Producer complies with requirements stipulated on the harvesting permit. In particular: • Transport Permits for every delivery of charcoal are pre-arranged.		
Chemicals and fuels	Chemical and fuel storage areas are bunded.		
	Storage areas are at least 100 meters away from any water course		
	Copies of Material Safety Data Sheets (MSDS) are present at storage area for each chemical. Dispense, transport, apply, store and discard chemicals according to MSDS.		
	Training is conducted regularly and maintained (Records are available).		
	No old chemical or oil containers are used for drinking, food storage or washing.		

Area	Basic Requirements	Yes	No
Marketing and sale of charcoal	Point of sale is where the timber is loaded onto the truck.		
	Sales documents contain the following information: • Certificate number and FSC® 100% claim on delivery note. • Certificate number and FSC® 100% claim on invoice.		

This checklist produced and provided by ECC is done so to promote a higher level of compliance and support the sustainable development of the industry in Namibia.

Names of FSC® consultants for Namibia

Independent FSC® consultants

- Stephan Bezuidenhout +264 (0)81 262 7872
- Michal Brink +27 (0)82 447 9477

Consultants to Processors

• King Charcoal	Koos Fourie	+264 (0)81 238 0083
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• Makarra Bushproducts	Ingo Jacobi	+264 (0)81 309 7797
• W Diekmann	Ingo Jacobi	+264 (0)81 309 7797
• Kilo 40	Gerhard Steyn	+264 (0)81 233 8795
• Alfacharcoal	Stephan Bezuidenhout	+264 (0)81 262 7872
• Corridor Logistics	Ingo Jacobi	+264 (0)81 309 7797

Important Contacts

The following list provides information on contacts in your areas. You should at all times get the information for the Directorate of Forestry from the local Forestry office in your region.

Namibia Charcoal Association:	**Roelien Coffee**	**+264 (0)67 304 220**
Alfacharcoal Namibia (Pty) Ltd:	Johan Leijenaar	+264 (0)81 122 3612
Carbo Charcoal Namibia:	Hans Steyn	+264 (0)67 240 279
Corridor Logistics (Pty) Ltd:	Ben-Louis van Vuuren	+264 (0)67 312 077
Etosha Charcoal:	Maans Roberts	+264 (0)67 313 797
Invader Bush Charcoal CC	Yvonne Thomas	+264 (0)85 573 4113
Jumbo Charcoal:	Ian Galloway	+264 (0)62 240 279
Kilo 40 Trading:	Gerhard Steyn	+264 (0)67 304 789
King Charcoal Namibia (Pty) Ltd:	Wessel Oosthuysen	+264 (0)64 221 858
Makarra Bushproducts:	Michael von Hacht	+264 (0)67 307 209
Namibian Retort Charcoal (Pty) Ltd:	Dirk Kaiser	+264 (0)81 802 4321
Savannah Charcoal:	Koos Fourie	+264 (0)81 238 0083
W. Diekmann:	Wolfhart Diekmann	+264 (0)81 149 5822
WM Trading:	Regina Januarie	+264 (0)81 256 5025
Ignite Products:	Bernd Klingenberg	+27 (0)34 995 9905
Nam-Char:	Paul Eek	+27 (0)21 976 1268
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