

“Shaping charcoal policies: context, process and instruments as exemplified by country cases”

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On behalf of



Table of Content

- Development policy background – basic premises 2
- Consideration of facts and trends 3
- What future role will charcoal play? 4
- Challenges and barriers to sustainable charcoal production - country examples 5
 - Governments ignore charcoal as main source of energy and leave it to the informal sector*..... 5
 - Weak policy coherence*..... 7
 - Lack of baseline information for policy formulation* 8
 - Limited will/ governance capacity to reorganize the charcoal production sector* 9
 - Charcoal as an underpriced energy resource* 9
- Conclusions..... 12
- References..... 13

Development policy background – basic premises

The paper at hand departs from the observation that, particularly in Africa, charcoal policies are hard to come by. But what actually are “charcoal policies”? The term “charcoal policy”, as used in this context, denotes an integrated public policy approach which addresses charcoal utilization in a comprehensive manner.

Given that charcoal is a marketable and highly commercialized commodity, one may conveniently regard charcoal utilization as a value chain – including wood supply, processing, transport, and various stages of marketing up to the individual end-user. Viewed from this angle, charcoal policies are – above all – **cross-sectoral policies** (or, rather, sets of sector-policies) which involve (and impact on) a particularly wide range of stakeholders. As most of the sectors relevant to charcoal utilization are exclusively controlled or dominated by government bodies (forestry, land administration, energy, etc.) “*Shaping charcoal policies*” must be primarily regarded as a **governance issue**. Charcoal policies reflect government objectives and development priorities.

As with all public policies, the effective & efficient implementation of charcoal policies depends not only on whether they are factually appropriate, but also on their legitimacy. One obvious means to enhance legitimacy is **multi-stakeholder participation**. Another is to demonstrate **coherence with globally recognized principles**, goals and relevant international regimes.

The Millennium Development Goals (MDGs) adopted by 191 member states of the United Nations, stipulate a globally shared responsibility to achieve sustainable development. Governments may thus enhance the overall legitimacy of public policies by aligning them demonstrably with the MDGs.

This provides a basic yardstick whereby charcoal policies may be measured. They need to maximize social and economic benefits, and to improve economic sustainability through efficient and productive use of forest energy [1]. Charcoal burning is a source of additional income and one of the survival strategies adopted by many households in arid and semi-arid zones all over Africa. Revenue from charcoal production may buy food, improve homes, and pay for children’s tuition fees & school material. Viewed from this angle, sound, comprehensive (and thus legitimate) charcoal policies may contribute to MDG 1 (eradicating extreme poverty and hunger), MDG 2 (achieving universal primary education), MDG 3 (promoting gender equality and empowering women), and MDG 7 (ensuring environmental sustainability).

The charcoal value chain is complex and may, on the surface, be regarded as principally related to energy-sector policies. However, charcoal production and use are interlinked with many more sectors, including forestry, agriculture, health, transport etc. Hence, shaping a charcoal policy is no isolated exercise, but requires **inter-agency communication** and **cross-sector coordination**. This does not happen spontaneously, but requires an adequate institutional setting. In this regard, shaping a charcoal policy also means to promote conducive procedural and administrative frameworks.

Measurable impact on the ground depends just as much on how a charcoal policy is implemented, as it depends on the issues raised above. In this sense, shaping charcoal policies

means to deliberately promote adequate selection and use of governance instruments (laws and regulations, incentives, planning and information).

As policies change over time, shaping charcoal policies must be regarded as a **learning process**. This calls for flexibility in implementation, continuous observation of changing circumstances, and impact-monitoring. It likewise requires capitalizing on past experience and lessons learnt.

This observation highlights the inherent characteristics of a policy: it is formulated and implemented, but also modified, repelled, interpreted, contested and resisted. It likewise draws attention towards the various actors involved in policy at different levels, the roles they play, the ways they relate to each other, and their networks of information exchange and learning.

Consideration of facts and trends

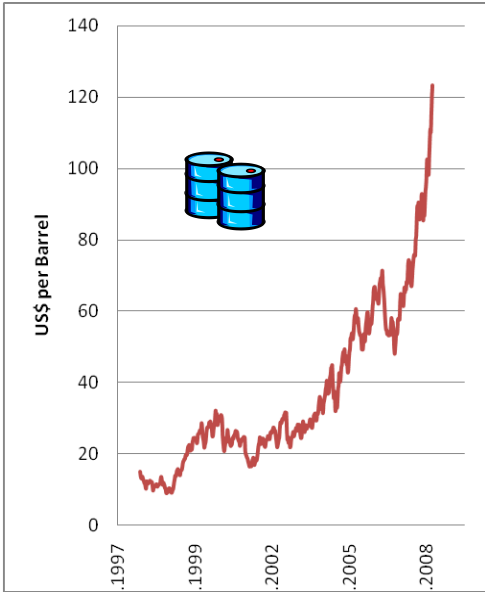
A charcoal policy cannot be designed without considering internal and external effects of the national and international energy development. Some of the most striking facts and trends influencing the formulation of a charcoal policy are cited hereafter:

a. Boost of the oil price

The oil price has tripled in the last 18 months and exceeded the symbolic 100 dollar threshold. Demand essentially from China and India is still expected to grow in the upcoming years. On the supply side it is difficult to keep up as oil and gas are finite resources.

In most developing countries the poor will be kept from ascending the “energy ladder” – a metaphor for the fact that, with rising income, consumers switch from firewood to charcoal to fossil fuels (Kerosene, LPG) and, eventually, to electricity. Rising fuel prices may even cause wealthier parts of society to revert to lower ranking sources of energy. In Madagascar, for example, people of the upper middle class return to charcoal, as they can no longer afford the high costs for LPG.

Figure 1: Development of world crude oil prices [22]



b. Climate change

In their fourth assessment report, known as AR4, the Intergovernmental Panel on Climate Change (IPCC) forecasts an average rise of global temperatures of 2.0 – 4.5°C. The actual magnitude of global warming is said to depend largely on the development of greenhouse gas emissions in coming decades. Deforestation and forest degradation account for 18% of global carbon dioxide emissions and thus spur climate change, as they release carbon stored in woody vegetation and impair the forests’ sink-capacity (FAO 2007).

Many studies argue that wood-fuels are carbon-neutral in that they do not alter natural carbon cycles. Replacing fossil fuels with wood-based fuels is therefore regarded as a means to mitigate climate change (IEA, 2004). However, when wood is harvested in an unsustainable manner and inefficient conversion/combustion technologies are used, a negative impact on the GHG emission is certain, often exceeding that of fossil fuels (Kammen, Bailis 2003). This obviously calls for improved ways of harvesting and production. Sustainable forest management, improved charcoal kilns and efficient stoves combined can lower GHG emissions and make wood-based fuels a carbon-neutral energy source.

In Europe, fuel wood received a boost due to efficient combustion technologies, record high oil prices, and government-policies that promote renewable energy to mitigate climate change. The 2007 Warsaw resolution of the fifth Ministerial Conference on the Protection of Forests in Europe explicitly recognizes forests as a major renewable energy resource.

In Finland, Sweden and Austria wood-based fuels already account for up to 17 % of the national energy consumption. For example, heating with CO²-neutral wooden pellets has become a cost-effective alternative to conventional fuels. The European Union has put limits on the overall energy consumption, aiming for a 20% decrease by 2020 (EC 2005). Consequently, EU Member States are beginning to adopt their national strategies to achieve this goal.

c. Agrofuels compete with food and biodiversity

With skyrocketing oil prices and growing recognition of the need for cleaner energy sources, 'agro-fuels' are increasingly regarded as a viable alternative to fossil fuels. Agro-fuel production and use have markedly increased. By now, side-effects of the agro-fuel boom become apparent. Agro-fuels have been identified as one of the driving factors behind rising agricultural commodity prices and food shortages world-wide. According to FAO, the wheat price rose by 80% within a year, and global cereal stocks have been depleted to a 25-year low. The World Food Program faces difficulties to feed 73 million people this year. Agro-fuels are also held responsible for distorting rural development in many of the countries concerned. Experience from Latin America and Asia reveals that smallholders are expelled from their land to make room for high-capital, low-labour agro-fuel industries which create serious rural conflicts [4]. It is also acknowledged that forests are being cleared to provide land for vast oil-palm plantations, with the inevitable consequence of shrinking wildlife habitats, loss of biodiversity, and declining livelihoods of forest-dependent rural communities. Such unintended, negative impacts cause many governments to reconsider their agro-fuel policies (including subsidies).

What future role will charcoal play?

Bio-fuels account for almost 80 percent of the total renewable energy consumption world-wide. They supply more energy than nuclear power-plants, and about four times as much as hydropower, wind, solar and geothermal energy combined. Wood is the most important biofuel [5]. Presently, half of the annually harvested round-wood (about 1.8 billion cubic metres per year) is used for fuel, as noted in a forests & energy report to the FAO Conference [6]. Wood-based fuels provide upwards of 70 % of the total energy consumption in Sub-Saharan Africa. The International Energy Agency predicts that by 2030, biomass energy in Africa will still account for an estimated three quarters of total residential energy [**Fehler! Verweisquelle konnte nicht gefunden werden.**].

Table 2: People Relying on Traditional Biomass (Mtoe);
World Energy Outlook 2006

	2004	2015	2030
Sub-Saharan Africa	575	627	720
North Africa	4	5	5
India	740	777	782
China	480	453	394
Indonesia	156	171	180
Rest of Asia	489	521	561
Brazil	23	26	27
Rest of Latin America	60	60	58
Total	2 528	2 640	2 727

In light of the rising costs for fossil fuels, and growing disenchantment over the negative side-effects of agro-fuels, forest energy will for several decades remain an important pillar in the energy mix of African countries struggling to meet an ever growing demand. Consequently, there is a need for official recognition of wood-based fuels in national energy policies.

Challenges and barriers to sustainable charcoal production - country examples

The following examples illustrate the major challenges and barriers to a sustainable charcoal production. They are subjectively selected by the author and in no way intended to be exhaustive.

It must further be acknowledged that many countries try to reform and to reorganize their wood-energy sector. Respective examples are cited. Most efforts, however, remain isolated measures, oblivious of the need for a comprehensive and holistic overhaul of the wood-energy sector.

Governments ignore charcoal as main source of energy and leave it to the informal sector

Many partner countries' national policies and energy-sector programmes tend to consider wood-based fuels (chiefly fuel-wood and charcoal) a "backward" and ecologically risky energy-source, and seek to discourage its use / mitigate its prevalence. Consequently they call for replacing the so called "traditional fuels" with "modern fuels" in the near future. For this, the Ugandan National Energy Policy 2002-2012 provides a case in point [7].

Despite the candid acknowledgement that biomass (firewood, charcoal and crop residues) accounts for up to 90 % to the total energy consumption, Uganda's short and medium-term policy priorities (2002-2012 years) are entirely focused on promoting fossil fuels or other substitute energy sources (see box).

<p>Uganda: Main foci of the National Energy Plan [8]</p> <ol style="list-style-type: none"> 1. Increase power generation 2. Diversify power generation sources to ensure security of supply 3. Increase access to modern energy in rural areas 4. Increase operational efficiency in the utility companies and connect more customers to the grid 5. Determine the petroleum potential of the country 6. Create a competitive petroleum supply market in the country 7. Promote the use of renewable energy and energy efficient technologies (geothermal, solar, wind, mini and micro hydro, etc) 8. Manage energy related environment impact 9. Improving energy governance and administration

Similar observations apply to the National Energy Policies of Sierra Leone and Chad, where political efforts centred on electrification absorb the lion's share of financial allocations to the energy sector. By contrast, studies in South-Africa revealed that even one decade past the introduction of electricity, 90% of the households continued to use wood-based fuels as a major source of energy for cooking [21].

So called "traditional energies" are deliberately shunned and left the informal sector, especially women. Hence the dominance of small-scale self-help approaches over strategic and concerted efforts. Not surprisingly, most energy policies bent on "modernisation" do not even mention gender-related issues. An analysis of 22 country energy policies and strategies revealed that only in two documents gender issues are mentioned: Tanzania, Zambia [9].

This attitude should be thoroughly revised, and policy support provided for the development of advanced, decentralised/community-based, integrated rural energy industries. These are key to bringing about the comparative advantages of forest energy, as well as to promoting the achievement of MDG targets. The following characteristics predestine wood-based fuels (particularly charcoal) to become a motor for rural development:

- Locally available and renewable resource,
- Potential for decentralised processing & production,
- Short transport distances with low risks,
- Generation of employment & local income,
- High potential for short-term improvement of efficiency (improved stoves, kilns etc.)
- High potential for technological innovation (chips, pellets, gasification, liquefaction)
- Climate friendly energy source (provided that sustainability standards are met),
- Charcoal yields a health-dividend, due to reduced levels of smoke, cleaner combustion and easy handling.

Progressive policies are required to these potentials for poverty alleviation and sustainable rural development. In Ghana's "Strategic National Energy Plan (2006-2020)" the decade-long disregard for wood-based fuels is openly recognised, and recommendations are made to institutionalise the wood-energy sector as a subsector in its own right. It is proposed to establish National Wood-fuel Office as a coordinating body, so as to improve management efficiency, promote charcoal-industries, and ensure a sustainable wood supply [10]. Sudan and, recently, Kenya have adopted specific legislation to govern their charcoal industries. Sudan in particular is praised for having created encouraging framework conditions. The lessons learnt from the Sudan example may be summarized as follows [11]:

- Charcoal is recognized as a key source of energy.
- There is a specific institution, a government para-statal, to implement wood energy policies.
- Production of charcoal from plantations and natural woodlands is well planned.
- Resources are allocated on a yearly basis for plantation establishment.
- There is strong public and private sector participation.
- Charcoal is a formal and lucrative industry.
- There are clear marketing arrangements and rules.
- Traders are organized into a formal association recognized by the government.
- The government raises royalties and taxes, which are reinvested in establishing plantations.

Weak policy coherence

Common goals can only be achieved by making sure that policies are not fragmented, that they do not overlap, and that they do not result in unnecessary or additional transaction costs. This calls for thorough inter-ministerial policy coordination.

However, policy coherence, consensus, and commitment in the wood-fuel sector suffer from insufficient open discussion of policy options. Additionally, the authority and jurisdiction of several ministries, agencies and associations lack clarity, with the result that some encroach on others' terrains.

In many countries (e.g. Angola, Senegal, Madagascar) the supply and demand side of energy is handled by different ministries. While the Ministries in charge of forestry set framework conditions for a sustainable management of a country's forests (and among other things license charcoal manufacture and trade), they do not deal with aspects of demand and end-use. However, as sustainable harvesting is inseparably linked with demand for biomass as fuel, a combined view covering both "upstream" and "downstream" in an integrated way is essential.

By example, it is difficult to comprehend why energy policy in Kenya on the one hand favours the dissemination of improved charcoal stoves, while on the other charcoal making remained for a long time illegal in the country. The same holds true for ad-hoc presidential charcoal bans designed to halt deforestation, which are at odds with other policies or effective legislation. Ethiopia, Kenya, Uganda, Chad, and Niger are pertinent examples – despite the fact that selling charcoal in all cases remained a perfectly legitimate business.

Kenya: Conflicts in sectoral policy and legislation [17]

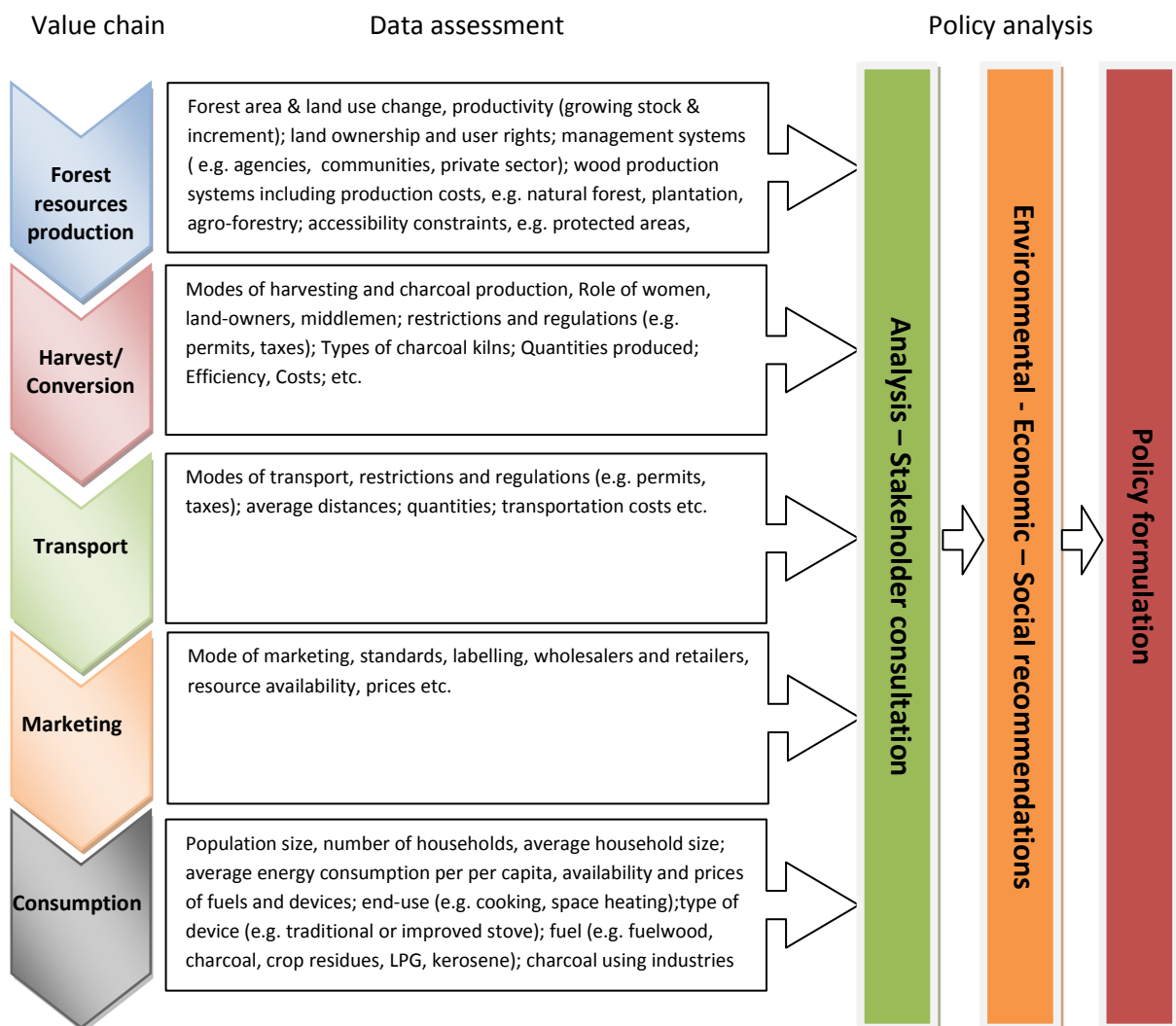
Specific policies and statutes on water, wildlife, and agriculture also have provisions for forest management. Some of these are contradictory, for example, policies for agriculture, forestry, and wildlife. The Wildlife (Conservation and Management) Act prohibits extractive uses of the forest, which the Forests Act permits. The Agriculture Act promotes putting more land under agriculture. In Kenya, agricultural land is restricted to high potential areas that are settled, most of them around high mountain forests that the Forests Act seeks to protect.

After having experienced substantial efficiency losses in managing the domestic energy sector by various stakeholders, the Government of Mali decided in 2003 to create a rural energy services agency (AMADER) with the mandate to promote household energy nation-wide. The main responsibilities comprise: (i) to expand rural markets for wood-based fuels; (ii) to improve the regulatory and fiscal framework as well as enforcement; (iii) to encourage the manufacture, promotion, and use of low cost equipment for wood-based fuels; (iv) to encourage fuel substitution where appropriate; (v) to consolidate planning, monitoring, and evaluation tools in the sector.

The principal means of fostering policy coherence are a national energy policy and a strategy designed to implement it, with roles and responsibilities assigned clearly to the various institutions (**institutional coherence**). Additionally, policies at each level (national, regional and local) ought to be streamlined *before* actions are implemented (**horizontal coherence**), and coherent implementation from national level downwards must be guaranteed (**vertical coherence**).

Lack of baseline information for policy formulation

Shaping charcoal policies (or any kind of policy, for that matter) presupposes reliable baseline information as a precondition for rational decisions. Past assumptions and predictions by national and international organizations regarding wood-based fuels were disproven in many cases. In the early 80ies simple scenarios for many Sahel countries forecast near-complete deforestation within 20 years [12]. Population growth and the shift from fire-wood to charcoal were highlighted as the main driving factors. In reality, natural woody vegetation in the Sahel proved much more resilient than expected. Wood-fuel exploitation alone clearly does not provide a summary explanation for ongoing deforestation on a national scale. It does, however, create problems locally which cannot always be reduced to a simple demand and supply gap. Wood-fuel problems are increasingly regarded as being rooted in more systemic – however locally site-specific - deficits in land tenure, fiscal and incentive policies, urban energy markets, and misallocation of forests and crop-land. All problems arise along the charcoal production chain. Therefore, precise data on the charcoal value chain provide an excellent entry-point for shaping sound policy frameworks. They offer an opportunity to the various stakeholders to add knowledge, innovation capital and technology at each step or link in the value chain. On this basis checks and balances may be introduced to assure a more balanced development within and between the sectors, with a view to achieving the intended overarching goals (e.g. MDGs).



Furthermore, evidence-based analyses of the charcoal value chain provide the opportunity to demonstrate the regional added value of charcoal production and thus help to sensitise policy makers for a source of energy hitherto neglected & left to the informal sector. Examples of study projects, geared towards a comprehensive assessment and analysis of the charcoal production chain, include: the supra-regional Chaposa project investigating the charcoal potential for Southern Africa [13]; the National Charcoal Survey in Kenya [14], the WRI/CIRAD research project in Senegal [15], and the study initiated by the Forest Governance Learning Group (FGLG) for Malawi [20].

Limited will/ governance capacity to reorganize the charcoal production sector

In many countries, the forest-sector's contribution to the national economy is marginal (2 to 4%), due to the fact that production and use of wood-base fuels are informal and thus escape official statistics (e.g. Uganda: formal sector 11% against 89 % in the informal sector [16]). Consequently, forest governance receives little attention and meagre budgetary allocations. For this reason, national funding often fails to adequately reflect local governments' needs and sources of revenue. In consequence, local branches of the forest service display low human, technical, and enforcement capacities. This problem is often exacerbated by half-hearted or arbitrary decentralization of forest governance which leaves local administrators ill prepared for the challenge of promoting community involvement or investment by the private sector. Such institutional weaknesses lower the morale of local staff, and invite corruption. Corruption coupled with unclear policy, and legal frameworks is seen as a major cause of unregulated or even illegal charcoal businesses.

Charcoal as an underpriced energy resource

Despite growing scarcity of wood, charcoal generally remains underpriced by more than 20 to 50%, relative to its economic cost in most African countries. This is mainly caused by insecure land-tenure, which leaves many forest areas open to free and unregulated access and use. In consequence, market prices of wood-based fuels reflect only the opportunity cost of labour and capital required for production and transport. Undervaluation translates into wasteful and inefficient production and consumption and creates a formidable disincentive for forest management and tree growing. The following examples illustrate the consequences:

- Investment costs for improved kilns (metal chimneys etc.) do not pay off [17] as long as wood remains a free resource. Despite training support, charcoal burners eventually abandon the improved technology. This is the main reason why the improved and superiorly efficient Casamance kiln has been disseminated since 20 years throughout Africa without success.
- Tree growing approaches stay ineffective, as planting and maintenance costs must be taken into account, when competing with open access resources. Significant subsidies (e.g. Madagascar: 200 to 300 €/ha) [17] are necessary to provide enough incentive. This holds also true for any investments in natural forest management.
- Substitute fuels such as kerosene must be highly subsidized to be competitive, as is the case in a number of countries (e.g. Senegal, Chad). On the one hand, the need for substantial subsidies creates a long-term foreign exchange burden and tilts a country's trade balance. On the other, no subsidies can ever be high enough to benefit poor households – in consequence, only the wealthier segments of society benefit. Furthermore, state subsidies for substitute fuels send wrong market signals, further

discouraging investment into tree planting or forest management by communities or the private sector.

By contrast, charging market rates for wood-based fuels would yield the following benefits [18]:

- more responsible and efficient resource use,
- revenue generation that creates leeway for strategic investment (e.g. in the forest sector),
- market incentives for tree planting and forest management by a wide range of stakeholders,
- highlighting the status of tree resources as a renewable resource,
- (rural) employment, and
- foreign exchange savings.

Cutting the Gordian knot of underpriced wood-fuel resources calls for a mutually synergetic three-pronged approach (see figure):

1. Adequate use regulation & enforcement

This requires introduction of a differentiated taxation scheme, and presupposes efficient tax collection. Differentiated taxation in this context means that *only* wood-based fuels stemming from open access areas are taxed. By contrast, communities/farmers who engage in sustainable management on their own properties would remain exempt from taxation (or similar disincentives). This needs to be certified by proof of origin (coupon system on the basis of sustainable exploitation quota). By taxing transport of cut firewood only, the system is comparatively easy to control and promotes efficient administration – as opposed to more extensive and highly decentralised systems based on the granting of firewood cutting permits.

2. Strategic shift from open-access forests towards secure tenure & sustainable forest management

Open access to natural resources carries the risk of unsustainable overexploitation (the “tragedy of the commons”). By contrast, sustainable forest management presupposes clear and secure long-term forest tenure (“property rights”). By example, a community may be granted exclusive control over natural woodlands growing on their territory, and the exclusive right to sell wood-based fuels harvested/produced thereon. In return, the community would be bound to enter into a formal agreement with the forest service to manage the woodland sustainably and to use improved kiln technologies (e.g. Village VERT approach in Chad). Private-sector operators are encouraged to help communities establish rural firewood markets. Once a community is registered as a Rural Firewood Market, outsiders are barred from obtaining local cutting permits.

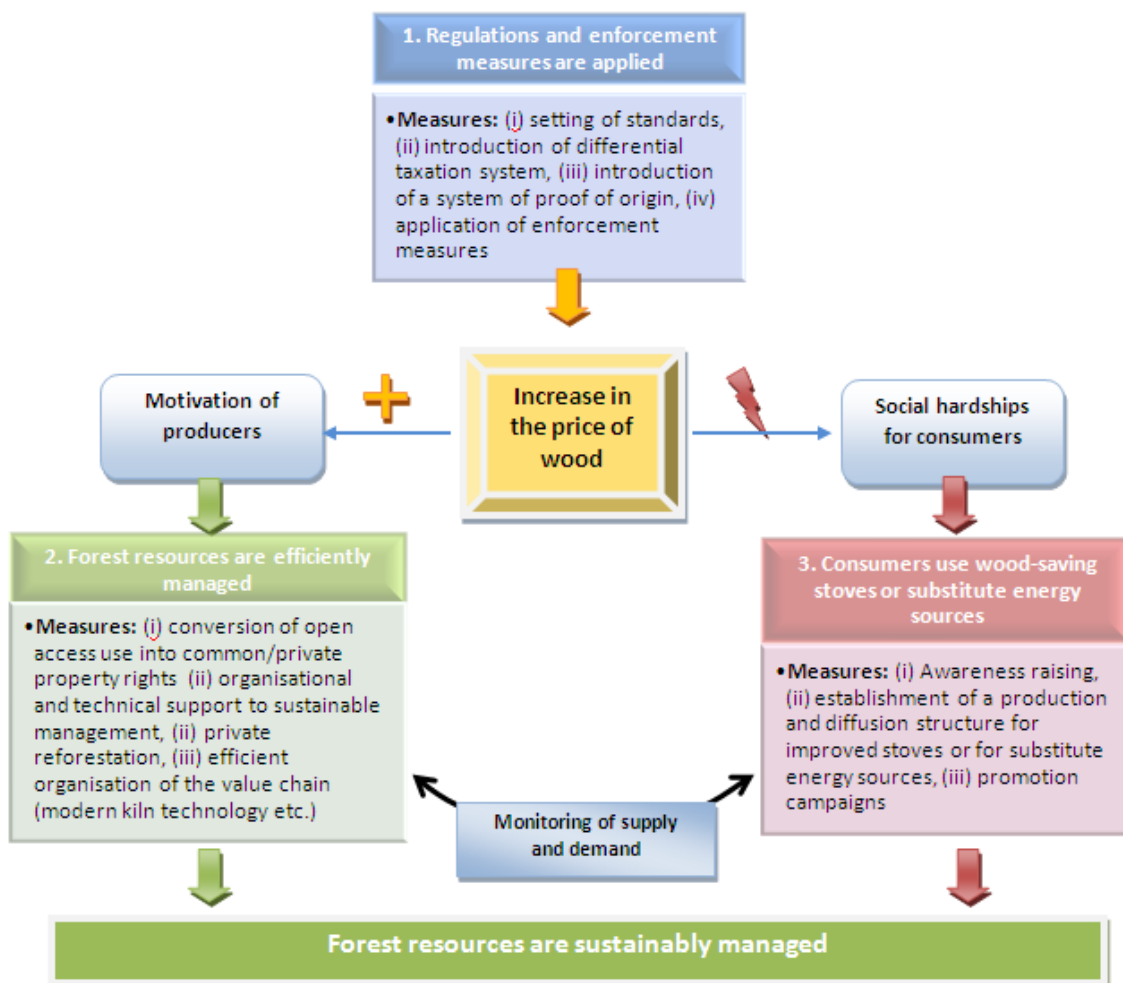
In countries with significant areas of marginal and/or degraded public land, privatisation of land for the purpose of tree-farming may be an option. Such schemes have the potential to preserve/ameliorate land and to augment wood-fuel supplies at the same time. The case of Madagascar may be cited as a particularly promising example, where tenure rights in respect of marginal public lands have been granted to individuals of local communities for the purpose of creating energy plantations [17].

3. Introduction of improved combustion technology

As measures 1 and 2 are designed to deliberately increase wood-fuel prices, they create market-incentives to use wood-based fuels more efficiently. However, poverty-stricken segments of society may be unduly and additionally burdened. This calls for targeted dissemination of fuel-efficient technology (i.e. fuel saving stoves) with the aim of mitigating disproportionate and unintended social hardships. At the same time, fuel substitution becomes more attractive for those who can afford it – without the need for costly long-term state subsidies.

In any case, continuous monitoring is a key-factor of success. To make the system work, the impact of market demand for wood-based fuels on forest resources must be observed, and timely responses devised to ensure sustainability under changing framework conditions.

This system was first introduced in the late 1990ies in Niger, Mali and Chad under the title “rural firewood market system”, albeit with different, country-specific approaches. To date, Mali may be regarded as the most advanced example. Notwithstanding persistent weaknesses in the fiscal, administrative and technical frameworks and lingering corruption, the system is widely regarded as a significant contribution to responsible resource management and pro-poor empowerment, decentralisation & good governance [18].



Conclusions

Energy consumption will continue to grow and, despite concerns about climate change and energy security, wood-based fuels will remain a major energy resource in Africa for decades to come. National energy strategies need to reflect, and capitalise on the comparative advantages and efficiency gains from using forests as energy source. Synergies between energy generation and regional forest industries must be fostered so as to reduce risks, increase profitability and promote participatory, sustainable forest management.

Charcoal problems and related response strategies are, of necessity, highly specific to framework conditions on national, regional and local levels. This precludes “blueprints” and panacea, and calls for careful adaptation to the prevailing circumstances on the ground. “Shaping charcoal policies” thus means to address two intervention levels: policy formulation and enforcement/practical implementation. In order to promote strong, substantial and sustainable growth in the wood-fuel sector, any policy must be predictable in the long term, have the potential to account for locally specific circumstances, and promote concrete, local-level projects. To this end, wood-fuel policies need to be designed within the context of a sustainable (rural) development approach, and principles of local control and participation adhered to in the planning process. Comparative advantages of locally produced/managed energy sources must be fully exploited, so as to assign wood-fuel production a pace-maker role for regional economic growth. To this end, hitherto exclusive mandates and responsibilities of national-level public agencies (e.g. the national forest service) should be transferred to private operators, non-governmental organizations and legitimate local governments. Quasi-monopolies enjoyed by urban-based charcoal traders should be replaced with more competitive and equitable market settings.

Regional charcoal strategies must address the entire supply chain and set out targets for clearly defined & verifiable quantities or percentages of wood-based fuels. The bureaucratic and administrative barriers e.g. overcomplicated forest management planning requirements, complex fiscal systems and land tenure procedures may inhibit development and thus warrant critical reflection. The regulatory framework needs to integrate externalities in order to promote adequate pricing of wood-fuel, and thus enhance regional economies.

In summary, the paper at hand advocates a combination of clear rules, transparent enforcement, strong incentives and awareness-creation/capacity development. Key stakeholders and the general public need guidance by way of information campaigns, training, and demonstration projects to ensure that awareness-deficits or false perceptions do not curtail policy implementation.

Last but not least, it will be decisive to improve networking and the exchange of expertise. The pool of regional experience and expertise is rapidly growing and should be better exploited in light of sounder policies. Reservations to learn and exchange knowledge and experience must be set aside in the pursuit of common goals. This holds true especially for the relationship between Anglophone and Francophone African countries.

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