

Namibia's Biofuels Policy

Kassian T.T. AMESHO

Ph.D Student, Institute of Environmental Engineering,
National Sun Yat-sen University, Kaohsiung 804, Taiwan

Yuan-Chung LIN

Professor, Institute of Environmental Engineering
National Sun Yat-sen University, Kaohsiung 804, Taiwan

INTRODUCTION

At the present moment, Namibia is using a considerable amount of bioenergy to meet its energy demands for various reasons such as domestic cooking and heating needs (e.g. wood and charcoal). But nevertheless, the environmental impact and emission levels emanating from burning of biomass differs depending on several factors including the type of biomass used, how its processed, and the types equipment used to burn it (Steag Energy Services, 2013). Yet the Namibian Renewable Energy Policy (REP) encourage and motivate the use of efficient and clean household equipment (e.g. cook stoves) using biomass and biofuels, which should be supported as a substitute to less efficient approaches to renewable energy and biofuels in particular (Namibia Nature Foundation, 2016). Furthermore, Namibia is considered to have a considerable and significant large amount of invasive plant species (also known as encroacher bush) which covers about 30% of Namibia's land area (GIZ, 2016). This encroacher bush accounts to a number of negative environmental impacts inter alias:

- Reduced biodiversity
- Limited land available for livestock
- Decreased groundwater available for other species

This great and significant amount of encroacher bush creates an opportunity for thermal energy and power generation applications. According to Oertzen (20110), the Namibian Renewable Energy Policy also encourage the use of biofuels for several applications that are economically feasible comparative to substitutes and enable to assist to meet the Namibia's Renewable Energy Policy goals.

Renewable Fuels in Namibia

Namibia has abundant feedstocks which allow the country to examine and foster the use of renewable liquid fuels such as ethanol, methanol, and biodiesel (Rama et al.,2013). Dubois (2008) has highlighted the ligno-cellulosic biomass potential in Namibia which is suggested to be as much as 25 terawatt per hectare, whereas the cellulosic biomass got a potential of 1.5 terawatt per hectare. If produced appropriately, innovative, a second and third-generation biofuels would result in a net-zero carbon emissions (Farooquee and Gireesh, 2015). Namibia has imported greater quantities of liquid transportation fuels (petroleum and diesel) due to its rising vehicle numbers in and the increasing passenger-miles (or kilometres) driven (Takavarashara, 2005). Hence the national production of biodiesel for transportation would consequently offer the advantage of reducing Namibia's imports and eventually put less pressure on foreign exchange outflows (RERA, 2014).

Namibia has explored several possibilities and opportunities that could further develop biofuels in the country such as *Jatropha* biofuel, castor and soy based biodiesel. Whereas the algae-based biofuel is currently cost-prohibitive in Namibia but could be investigated for cost-reductions in the future, as well as dry biomass based biofuel (GRN, 2004). But due to the prevalence of invader bush in Namibia, the last of these could be the greatest promising possibility (with one source estimating yields of 190 liters of yield from one ton of dry biomass) (NPC, 2004). GIZ (2016) has identified blackthorn in Namibia as one of the most viable biofuel source in Namibia, that could provide thermal energy in the form of wood chips for cement manufacturers (such as Ohorongo Cement). Biofuel production would also equally provide co-benefits such as job creations in rural areas, while promoting and encourage rural development, income diversification, and skills-building in rural settings (Mitchell, 2009). Nevertheless, on numerous occasions, the biofuels production comes with difficulties, extending from impacts on soil and water, trade-offs with food security, impacts on biodiversity, management costs etc. Therefore, this type of renewable fuel development is frequently suited to experimental, pilot projects before scale-up and commercialization. As such, biofuel development would be a good candidate for R&D and field trials in the proposed Renewable Energy Development Zones (REDZ) (UNIDO, 2015).

The development of the biofuel industry is typically challenging in the absence of proactive government support in the form of subsidies, fixed tariffs, seed funding, financial incentives (like tax breaks or rebates) etc (NAB, 2009). At the same time, the government must also provide safety measure to ensure sustainable land use and to control possible negative impacts from biofuel production. This is because, the complexity of managing and growing a renewable fuel industry calls for an enthusiastic biofuels policy, grounded on an in-depth understanding of Namibia's own experience with biofuels (World Bank, 2008).

Regulatory Framework for Biofuels in Namibia

This section gives an overview of the policy and governing background relating to biofuels in Namibia. FAO defines bioenergy simply as energy derived or generated from biofuels. Whereas biofuels are very widely defined as 'fuels of renewable and biological origin, including woodfuel, charcoal, livestock manure, biogas, biohydrogen, bio-alcohol, microbial biomass, agricultural wastes and bio-products, and energy crops' (ACP, 2016) .

National Level

There is no official legislation devoted explicitly to the regulation of biofuels. The Namibians government has showed interest in the production of biofuels (GRN, 2014). This lack of regulatory mechanisms on a national level is not only inclusive to Namibia but reflects the international situation. However, a 'National Roadmap on Crop-Oil for Energy' that was launched in August 2006 with emphasis on production, marketing and utilization among others, which will assistance the country to meet its obligations to international treaties (UNIDO, 2015). The Vision Statement agreed to in Namibia's road map: ('Vision for a bio-oil energy industry in Namibia') 'An established bio-oil energy industry that contributes to a flourishing and profitable bio-oil energy economy and eloquently supports Namibia's development goals as envisioned in Vision 2030. The road map has created new development project, bio-fuel project of Namibia with entirely focus on terrestrial crops, explicitly *Jatropha curcas* (NAB, 2009). Many countries seeking to create an inclusive regulatory framework for bioenergy should ensure that regulatory measures are linked with wider environmental protection and development goals (World Bank, 2008). Namibia is on the right path in terms of compatibility with the country's Vision 2030 strategy and development aims,

as well as requirements, regulations and mechanisms in terms of the Environmental Management Act and international environmental policy and legal instruments (Steag Energy Services, 2013).

Globally: At present, no international arrangements explicitly speaking to bioenergy developed hitherto, although several prevailing international environmental agreements and conventions impose responsibilities on member states to take regulatory measures to discourse climate change and reassure the advancement of legal frameworks on bioenergy. The legislative and policy initiatives are often collective in regulating this new sector of biofuels (ACP, 2016). Lately, some countries have chosen to create a regulatory framework for bioenergy or biofuels by passing legislation specifically on the topic. While in other circumstances, some governments have articulated their responsibility to encouraging biofuels by the formulation of policies that are not legally binding but designed to match the existing national legislative frameworks.

International Framework	National Framework
<ul style="list-style-type: none"> • 1992 Convention on Biodiversity (CBD) • 1992 UN Framework Convention on Climate Change (UNFCCC); • Kyoto Protocol to the above-mentioned UNFCCC • 1996 UN Convention to Combat Desertification (UNCCD) • 2002 World Summit on Sustainable Development (WSSD) • 2004 Bonn International Conference for Renewable Energies 	<ul style="list-style-type: none"> • Namibia’s Agronomic Industry Act of 1992 • Namibia’s Petroleum Products Act 13 of 1990 • Namibia’s Environmental Management Act 7 of 2007 • Namibia’s Constitution (1990) • Environmental Investment Fund of Namibia Act 13 of 2001 • Namibia’s Forest Act 12 of 2001

Source: ACP, 2016.

CONCLUSION

The promotional activities, such as fiscal support and budgetary grants (funded implementation and programmes, subsidies) and tax concessions are essential strategies to encourage and motivate the development of bio-energy industries (RERA, 2014). It is also very paramount to bear in mind that the relationships between bioenergy and sustainable development are multifaceted, based on several issues such as:

- Energy crop
- Cultivation method
- Conversion technology
- Conditions and alternatives on a country-specific basis

The effects of policy and legislation in interrelated sectors in Namibia, such as Agriculture, Forestry, Environment, Fisheries, Energy and Trade may have profound impacts on the development of an active biofuel programme.

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