

and action plan	Develop strategic intervention measures, target objectives and activities, action plan, all for implementation of EF program	Strategic intervention measures, target objectives and activities, action plan, all for implementation of EF program developed.	Financial institutions		
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Various actors will have different roles in relation to the strategic objectives and related activities requiring attention

### 3.4 Sustainable Charcoal Utilization and Production

Sustainable charcoal involves both sustainable forest management, and use of efficient improved kilns and stoves. The basic components of sustainable charcoal systems include supply and demand side interventions. Supply side interventions are aimed at managing forest resources for charcoal production to include: (i) agro forestry, (ii) woodlot management, (iii) controlled exploitation of forestry resources, (iv) improved carbonization skills and technologies. Demand side interventions include: promote use of improved cookstoves and briquetting, (ii) create awareness on energy conservation, and encourage use of eco-charcoal concept of certification.

In view of the strong relationship between charcoal utilization through use of cooking stoves and charcoal production and their combined effects on deforestation and forest degradation and associated GHG emissions, the actions on improved charcoal production and improved cooking stoves have been merged and considered in a holistic manner considering the entire sustainable charcoal value chain. The value chain involves the following processes to include; (i) forest resources and production, (ii) harvest conversion, (iii) packaging and harvesting , (iv) transport, (v) marketing , (vi) consumption, (vii)financing

The SNDP strategic objective under natural resources is the promotion of sustainable forest and land management in particular focusing on expanding options for effective forest management. The target of diffusion for sustainable value chains technology is aimed at contributing to the attainment of the strategy above. Once implemented, the measure will go along way to the contribution of reduction of the current deforestation rate estimated between 250,000 to 300,000 hectares per year.

Strategic Objective	Development of a sustainable charcoal value chain framework and implementation				
Strategies	Output		Responsibility	Timeframe	Budget(Estimated Budget)
	Objective verifiable activity	Means of verification	Key actors		
Strengthen forest resources and	Strengthen the Forest Act to include specifically charcoal production	Forest Act strengthened with introduction of specific charcoal production regulation.	FD, Local Government,	12 months	20,000

production legal framework for charcoal production	regulations aimed at specifying forest management plans , wood production systems		Charcoal producers Association, DOE, ZEMA, District Councils, Traditional leadership, civil society		
	Establish a harvesting committees at the local level with the roles to manage charcoal production in accordance with the set rules at that level including monitoring , reporting and verification	Institutional arrangement created at the local level for governance of charcoal production			
Harvest and conversion	Introduce and specify improved charcoal production technologies for use	Improved charcoal production techniques introduced and disseminated.	FD, Local Government, Charcoal producers Association, DOE, ZEMA, District councils, Traditional leadership, civil society	36 months	100,000
	Develop capacity and skills for the operators on construction, operation and maintenance of improved charcoal making production technologies	Capacity and skills developed among charcoal production operators on construction, operation and maintenance of improved charcoal making production technologies			
	Creating awareness and information of benefits of improved charcoal production technologies to various stakeholders(operators )	Awareness and information created for up scaling of use of charcoal production technologies			
Transport	Specify appropriate modes of transport with restrictions and regulations	Specification of modes of transport provided with corresponding restrictions and regulations	Ministry of transport, Transport associations, Charcoal traders, Zambia Police, RTSA	36 months	50,000
	Monitor transport costs in relation to average distances covered and quantities carried.	Transportation costs continuously monitored and serve as input in the end charcoal price			
Marketing	Specify mode of marketing through designation of charcoal marketing sites	Modes of marketing specified	Local authorities and charcoal traders association	12 months	20,000
	Specify proper storage/depot and standards	Storage and standards specified			
Consumption	Introduce and standardize improved cookstoves	Standards on improved stoves formulated and actual stoves disseminated	Bureau of Standards, artisans, R&D community, civil	36 months	500,000

	Create awareness and information of benefits of improved cookstoves.	Awareness s and information among end users created aimed at up scaling dissemination of improved cookstoves	society		
Financing	Develop an innovative financing mechanism through provision of dedicated fund and involvement of micro financial institutions to provide risk capital and development of business model for charcoal producers, transporter and traders	Innovative financing mechanism created for charcoal producers, transporters and traders	Financial institutions, MFIs, philanthropic finances , donor funding and dedicated fund	36 months	500,000
	Develop innovative financing mechanism and Involvement of micro financial institution to provide micro credit. To improved cooking stoves end users	Innovative financing mechanism created for provision for micro credit for end users			

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### 3.5 Biodiesel - Biofuels Development

Biodiesel fuel can be produced from oilseed plants such as sunflower, soy beans, and jatropha. Bio Diesel can be used alone or mixed in any ratio with mineral oil diesel fuel. Biofuels production chain is characterized by the cultivation, production, gathering and transport of feedstock, and its conversion to yield biofuels as an energy carrier, distribution and end-use. To arrive at sustainable biofuel production requires (i) assessing what bioenergy technology and feedstock options are available, (ii) identifying suitable areas for production, (iii) assessing impacts to include environmental and natural resources impacts, socio-economic effects, and food security impacts, (iv) develop risk mitigation measures

The SNDP strategic objective for biofuels under energy is to increase the use of biofuels as a substitute to mineral fuels at 10% and 5% for bioethanol and biodiesel, respectively, and to develop a rationale and implementable approach to improve sustainability of biomass supply. The target for diffusion of this technology is formulation of a conducive environment for contributing to biofuels development in Zambia.