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# SUSTAINABLE FISHERIES MANAGEMENT PROJECT (SFMP)

## Business Model Options and Strategy For Upscale of Stoves



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## ACRONYMS

ADKAR	Awareness, Desire, Knowledge, Ability and Reinforcement
BCC	Behavior Change Communication
CEWEFIA	Central and Western Fish Mongers Improvement Association
CSO	Civil Society Organizations
DAA	Development Action Association
DP	Development Partners
ICS	Improved Cookstoves
IEC	Information Education and Communication
IFSS	Improved Fish Smoking Stoves
MFI	Microfinance Institution
MSME	Micro Small Medium Scale Enterprise
NAPFTA	National Fish Processors and Traders Association
NGO	Non-Governmental Organization
ODA	Official Development Assistance
PD	Positive Deviance
PPP	Public Private Partnership
R&D	Research and Development
SETH	Social Economic Time and Health
SFMP	Sustainable Fisheries Management Project

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## EXECUTIVE SUMMARY

This business strategy and model option document provides holistic strategies and a comprehensive business model for upscale of improved fish smoking stoves in Ghana. It has been developed to assist government, development partners and businesses in the improved cookstoves market with the requisite business strategies and models to reach scale.

The document also draws upon lessons from other business models used in scaling improved fish smoke stove adoption in Ghana and other parts of the world. Some of the lessons learned from previous and past interventions as well as strategies are as follows;

- provision of full scale subsidies (100%) to end-users;
- promotion of the improved cookstoves on only its health benefits without relating specifically to the social, economic and time benefits,
- Some of the business models were directly implemented by the civil society organisations with no participation from government, the private sector and end-users,
- Did not recognise the role of the private sector (stove enterprises and financial institutions) as well as involve the private sector.
- using local and community level volunteers who were trained as artisans to construct stoves and after end of project did not see the skill as a source of livelihood and
- Disintegrated efforts of partners and relevant stakeholders in promoting the improved cookstoves.

The above mentioned factors contributed to failure of the projects in reaching scale with improved cookstoves.

The document on the other hand, harmonises other business models and provides a unique approach to promotion, marketing and financing improved fish smoking stoves.

Current attention to improved stoves has focused on the “triple benefits” it provides; time savings for households, preservation of forests and associated ecosystem services, and improved health the objectives of healthy fish market and reducing emissions that contribute to global climate change. Despite the purported economic benefits of such technologies, progress in achieving large-scale adoption and use has been remarkably slow. The main challenges to scaling up in the IFSS sector are:

- Weaknesses in the upstream segment of the value chain, including business models, access to financing, market intelligence, consumer awareness, and regulatory frameworks.
- Development of contextualised local technologies that are affordable and has the capacity to argument large scale production levels.

To reach the desired scale, there must be a conscious paradigm shift from a socially inclined approach (free distribution of stoves and subsidizing the cost of the stoves) to a commercially viable approach. The provision of improved fish smoking stoves for fish processors in Ghana must be seen as a business opportunity rather than a social service. This is to ensure upscale through increased demand and sustainability as a result of strengthened supply chains. To achieve this, there is the need to expand and promote private sector participation by way of strengthening the supply chains of improved fish smoking stoves through local artisans and enterprises.

Early efforts to disseminate cleaner and more efficient cookstoves to those at the base of the pyramid in developing countries, were mostly subsidised through ODA and development programs. Many for-profit initiatives, which emerged during the 1990s, succeeded in achieving financial soundness and were able to disseminate improved cookstoves

technologies while generating local economic value. This paradigm shift reframes the energy access gap into a largely untapped market and drives the stove industry today. This presented a unique opportunity for lessons to be learned and the need to ensure inclusive business through private sector participation.

## **Methodology**

Participatory methods were used in soliciting for the data and views of relevant stakeholders, including some of the improved fish smoke stove value chain actors. The key participatory methods employed were; focus group discussion, small group discussion, brainstorming session and key informant interview. Some direct interviews were also conducted with financial institutions [Rural Banks and Microfinance companies].

Desk review of existing documents and reports on upscale of improved fish smoking stoves were also conducted in extracting lessons, models and other approaches used in Ghana and other parts of the world to reach scale with improved stoves.

The following SFMP implementing partners participated in the business strategy/model options brainstorming session; Fisheries Commission (representing government and also industry regulator), DAASGIFT Quality Foundation, DAA and CEWEFIA. The focus group discussions were held at Elmina, Winneba and Shama in the Central and Western Regions of Ghana for Fish smokers, Input dealers of fishing materials, selected regional NATFA Executives and Konkohemaa/hene. The small group discussions were held with the executives of NAFPTA nationwide at Dodowa during their national executive leadership training session. The key informant interviews were conducted with the Assemblymen, Konkohemaa/hene and chief fishermen.

For an effective and sustainable business model, all the major actors within the improved fish smoke stove value chain would have to be recognised. Businesses exist in pursuance of triple bottom line objectives of; profitability, social mission and environmental/health impact and hence the need for a private sector that can operate with the objective of providing energy efficient and improved stove technologies for fish smoke processing. Hence the need to align the private sector business (Fish processors and stove enterprises) interest towards the triple bottom-line objectives in the upscale of improved cookstoves. To reach scale, the role of government and financial institutions in linking the demand and supply cannot be overlooked. The diamond business model is proposed as a holistic model that seeks to bridge the gap between demand and supply by creating the required enabling environment for increased access to improved fish smoking stoves and sustainable businesses.

## **The Diamond Business Model**

The diamond business model (Figure 1) has been developed with adaptation from Michael Porter's diamond of national advantage (Porter, 1998). The Diamond business model provides a clear sustainable business pathway that creates and strengthen the market linkages among the beneficiary end-users, the business (builder/supplier of improved fish smoking stoves), development partners, financial institutions, and government. The model is an inclusive business model that identifies and provides clear understanding of the dynamics within the market in reaching scale. The model also defines the specific roles of development partners in linking demand created with supply via government and financial institutions. The model creates an ecosystem of inter-relationship between end-users, stove builders/enterprise, development partners, financial institutions and government.



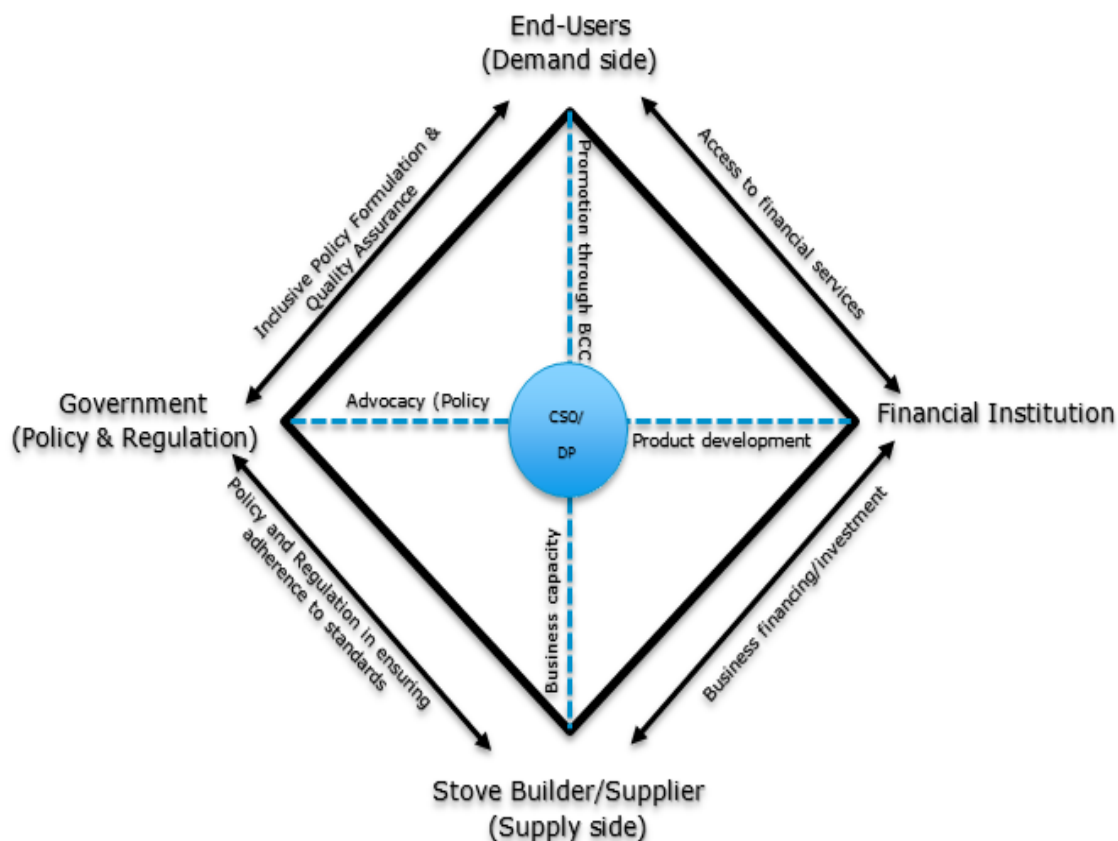


Figure 1: The Diamond Business Model

## Business Strategies

To ensure increased adoption of improved fish smoke stove in Ghana, there must be ideal business strategies; the business strategies required to harness smooth and effective implementation of the diamond business model are; Promotional, Marketing, Financing and Pricing.

### Promotional Strategy

Promotion of improved fish smoking stoves is necessary to enhance adoption and use by targeted end-users. Promotion facilitates transmission of key information to targeted beneficiaries on the benefits of the improved fish smoking stoves and the hazards associated with the use of traditional fish smoke stoves. To reach scale, it is important for promotional activities to centre on BCC models such as; diffusion of innovation theory, health belief model, positive deviance approach, ADKAR model and theory of planned behaviour. Combination of these models is necessary to trigger the desired change towards adoption, ownership and use of improved fish smoking stoves in Ghana. To allow for effective upscale of improved fish smoking stoves in Ghana, the Social -Economic -Time and -Health (SETH) Model is recommended as a holistic approach for the promotion of improved fish smoking stoves. The SETH model assumes that, promotion of improved fish smoking stoves must be on the grounds of the following benefits; Socio-cultural, Economic, Time and Health.

## **Marketing Strategy**

Marketing strategies may crucially influence the performance of a commercial stove-selling venture. For effective marketing of improved cookstoves in Ghana and specifically improved fish smoking stoves, the social marketing approach must be employed. Studies of both commercial and non-commercial distribution of health-improving products have emphasized the importance of “social marketing”. Social marketing is a process for creating, communicating, and delivering benefits that a target population desires in exchange for adopting a behaviour that profits society.

To be able to effectively utilise the social marketing strategy to enhance the upscale of the improved fish smoking stoves in Ghana, there is the need to apply marketing mix referred to as the Four Ps. The Four Ps (Product, Place, Promotion and Price) are to any social marketing initiative. The social marketing approach must be complemented with marketing campaigns and other marketing related activities.

## **Financing Strategy**

Financing strategy is a critical part of the business model (Zerriffi, 2011). Unlike fully subsidized programs, a commercial venture selling to low-income populations must find a way to make its products financially accessible to its customers. Without end-user finance options available for the fish processors, it will be very difficult for improved fish smoke stove builders/enterprises to achieve significant scale in Ghana. The potential market for improved fish smoking stoves can be transformed into actual customers if end-users can access finance for the purchase of the improved fish smoking stoves and its related services. This has benefits for the end-users [Fish Processors], stove builders/enterprises, and Financial Institutions [lenders]. Four end-user financing models have been developed to facilitate effective end-user financing of improved fish smoking stoves in Ghana. These are; dealer financing model, umbrella financing model, brokering financing model and inclusive financing model. The suggested end-user financing models provide sustainable model for government, development partners, stove builders/enterprises and financial institutions to adopt.

End-User financing models cannot be implemented in a vacuum, it requires some level of financial intermediation between the demand and supply chains of improved fish smoking stoves. It also requires legal and policy framework to work effectively especially in emerging markets. The key legal and policy considerations include: financial sector regulation, interest rate policies, legal enforcement of contracts and ability to seize pledge assets.

## **Pricing Strategy**

Pricing is one of the four key elements of the marketing mix, along with product, place and promotion. To ensure effective upscale of improved fish smoking stoves in Ghana, improved stove enterprises that produces and sell improved fish smoking stoves as well as organisations that play intermediary roles in ensuring access to improved fish smoking stoves need to take into cognisance various pricing strategies to enhance market share.

To reach scale, two pricing strategies have been recommended for businesses and development partners engaged in the promotion and adoption of improved fish smoking stoves in Ghana. The penetration and Bundle pricing strategies are recommended for adoption by energy enterprises and development partners for effective upscale of improved fish smoking stoves in Ghana. One of the major determinants of demand is price and hence the need to place importance on pricing of improved fish smoking stoves.

A penetration pricing strategy is designed purposely to capture market share by entering with a low price relative to the competition to attract buyers. For instance the average cost of the Morrison stove on the market is USD300 with 8 processing trays, the price of the stove can be reduced if the number of processing trays that comes with the stove is reduced from 8 to 4 trays as a penetrative pricing approach. This because present cost of the chorkor stove of USD60 excludes the processing trays. Pursuing a bundle pricing strategy allows the business entity to increase profit by giving end-users a discount. Bundle pricing is built on the idea of end-user surplus which is offering the bundle at a reduced price for the end-users. The bundle price for the improved fish smoking stoves should take into cognisance the following elements; cost of raw materials, labour cost, installation fee, training fee, after sales service fee, processing trays and chimney.

## **Conclusion**

Fish processing is a major economic activity of the women along the coastal belt of Ghana and in most fishing communities. To improve on the quality of fish processed by these women engaged in fish smoke, there must be a shift from the use of traditional/round mud fish smoking stoves to an improved fish smoking stoves which consumes less fuel wood and has good fuel emission. Presently, the adoption and use of traditional fish smoke stoves is wide spread along the coastal belt of Ghana. Majority of the women use the chorkor fish smoke stove and other traditional stoves. The most basic requirement for improved fish smoke adoption is acquisition. It also requires that the fish processors have the decision-making power and the economic resources to make the purchase. The use of appropriate behaviour change communication tools as would enhance and skewed their decision-making power towards an improved fish smoking stove.

## **Recommendations**

The objective of healthy fish market can only be achieved if improved fish smoke stoves are used by the processors engaged in fish smoking. To reach scale with the adoption and use of improved fish smoking stoves in Ghana, the following are recommended:

- To reach scale with adoption of improved fish smoking stoves in Ghana, it is necessary to adopt a sustainable business model that triggers and sustains the adoption and use of improved fish smoking stoves, for which the diamond business model is recommended, as a holistic model for the upscale of improved fish smoking stoves in Ghana. The model creates an ecosystem where the demand and supply chains effectively interact to improve the market linkages through financial institutions and government.
- The provision of financing options for both the end-users and the enterprise that build or supply improved fish smoking stoves is necessary to reach scale. Implementing suitable financing options by way of linking the end-users and stove builders/suppliers will link demand and supply of improved fish smoke stove in Ghana. To reach scale, the dealer financing and inclusive financing models are recommended. The two models provide a sustainable approach to financing acquisition of improved fish smoke stoves.
- To reach scale with adoption of improved fish smoking stoves in Ghana, promotion must be stepped up using behaviour change communication strategies and models. For effective and efficient promotion of improved fish smoking stoves, combination of the ADKAR model, health belief model and Diffusion of innovation theory with the SETH Model serving as pivot around which these combined models must be used. No one single model will be adequate to reach scale with adoption.
- Marketing plays a major role in demand creation and in the accumulation of goods in almost every society. Generally, effective marketing requires a creative strategy that is built around insights about the fish processors. To reach scale, the social marketing

approach is recommended as it hinges on the 4Ps namely; product, place, people and price. Improved fish smoke stove promoters especially development partners and businesses should be confident in marketing the product based on what the consumer has identified as the most important attribute such as; the capacity of the stove, fuel emission, cost savings on fuel wood purchased, durability of the stove and availability of the technology. SFMP and its implementing partners must intensify promotion and marketing campaigns.

- To ensure adoption to improved fish smoking stoves, targeted end-users must be engaged in the design of the stoves and be allowed to make input based on their experiences with the traditional stoves. Government, CSOs and enterprises need to engage with users directly by way of product demonstrations as is the most effective driver of stove adoption.
- To reach scale, it is necessary to effectively engage women in ways that accommodate or help overcome existing constraints while building their capacity for their successful involvement. As the primary end-users and beneficiaries of improved fish smoking stoves, the women fish processors are therefore integral to any awareness and educational campaigns.
- Women constitute majority of the workforce engaged in fish smoking in Ghana and therefore can be potential main target beneficiaries for adoption of improved fish smoking stoves. The key actors within the fish smoke value chain are mostly women and are central to improving healthy fish market. Women are uniquely positioned to promote adoption and use of improved stoves in Ghana.

## 1.0 BACKGROUND

Over half the world's population still uses solid biomass or coal fuels for basic cooking and heating. The overwhelming use of this form of fuel or solid biomass has in recent times caught the attention of many due to harmful effects caused at three distinct levels. At the household and community levels, combustion of solid fuels produces pollution that is damaging to health and a large contributor to the global burden of illness; and imposes a high time burden on those collecting fuelwood, typically for women and girls because it mostly keep the girls out of school and for those in school affects their learning at home as they have to travel over long distances in search for fuel wood. At the community and national level, when fuel wood is harvested in unsustainable ways, its consumption contributes to the loss of forest and associated ecosystem services.<sup>i</sup>

In the past decade, promoting access to fuel efficient stoves were catchphrases which featured prominently in policies and development interventions in Ghana. Ghana like many developing countries witnessed colossal investments in raising the needed awareness and developed various approaches aimed at increasing access to fuel efficient stoves for households and Agro Processors. In this respect, Government and Development partners contributed to helping communities to engage more meticulously and contemplatively to change behaviour, and strengthen local and institutional capacities to facilitate the construction and maintenance of fuel efficient stoves. These efforts contributed to creating the needed awareness on ownership and the use of improved cookstoves in Ghana.

Ghana has a marine coastline of five hundred and fifty (550) kilometres stretching from Aflao in the East to Half Assini in the West; the fishing industry plays a major role in sustainable livelihoods and poverty reduction in several households and communities.

The mainstay of the economy along the coastal belt of Ghana for women is fish processing. It is no doubt that the Fisheries sector plays a vital role in the socio-economic development of Ghana.

Access to and use of improved cookstoves is essential for fish processing in Ghana as it reduces the health risk associated with the processed fish and increases the production volumes and improves quality. Reaching scale with improved cookstove is must be a high priority for government and it development partners.

To reach scale, there must be a conscious paradigm shift from socially inclined approach (free distribution of stoves and subsidizing the cost of the stoves) to a more commercially viable approach. The provision of improved stoves for fish processors in Ghana must be seen as a business opportunity rather than of a social service. This is to ensure upscale through increased demand and sustainability as a result of strengthened supply chains. To achieve this, there is the need to expand and promote private sector participation by way of strengthening the supply chains of improved cookstoves through local artisans and enterprises.

Although there are considerable number of private sector participation in the supply chain of improved cookstoves, these businesses are not able to efficiently and effectively produce to scale. This is because most of these businesses in the past have depended solely on grants from development partners to pre-finance the production of the stoves due to inadequate working capital and business mind-set. The resultant effect has been their inability to develop independent business models that can be self-sustaining.

Development partners in their quest to contribute to efforts to achieve sustainable business solutions for upscale of improved cookstoves in Ghana, developed and implemented various intervention models. Unfortunately majority of these models failed largely due to little or no attention to the business that would hold the market after the lifespan of the projects.

### **1.1 Purpose of the Business Strategy/Model Options**

The purpose of this business strategy/model options is to provide a road map for the upscale of improved cookstoves in Ghana specifically improved fish smoking stoves for fish processors along the coastal belt of the country. The document also provides a clear pathway for the SFMP implementing partners with regards to upscale of improved fish smoking stoves in Ghana.

### **1.2 Methodology**

Participatory methods were used in collecting data and views of relevant stakeholders including some of the improved cookstoves value chain actors. The key participatory methods employed were; focus group discussion, small group discussion, brainstorming session and key informant interview. Some direct interviews were also conducted with financial institutions [Rural Banks and Microfinance companies]. Desk review of existing documents and reports on upscale of improved fish smoking stoves were also conducted in extracting lessons, models and other approaches used in Ghana and other parts of the world to reach scale with improved cookstoves.

The following SFMP implementing partners participated in the business strategy/model options brainstorming session; Fisheries Commission (representing government and also industry regulator), DAASGIFT Quality Foundation, DAA and CEWEFIA.

The focus group discussions were held at Elmina, Winneba and Shama in the Central and Western Regions of Ghana for Fish smokers, Input dealers of fishing materials, selected regional NAFPTA Executives and Konkohemaa/hene.

Small group discussions was organized for NAFPTA executive members at the national level to solicit their views on appropriate business strategies to reach scale at Dodowa during their national executive leadership training session. A total of 60 NAFPTA executives participated in the small group discussions.

Key informant interviews were conducted with the Assemblymen, Konkohemaa/hene and chief fishermen at Anlo beach, Shama, Ankobra and Axim. Focus group discussions were held separately for selected fish processors, chief fishermen, konkohemaa/hene, input dealers and off-takers (fish Traders) at Winneba, Elmina and Shama to solicit their views on appropriate strategies to reach scale with adoption of improved fish smoking stoves. A total of 45 persons participated in the focus group discussions.

The following financial Institutions were also interviewed to solicit their views on financing models for the improved cookstoves; Boin Microfinance, Ankobra Rural Bank, Ahantaman Rural Bank, Credit Union AF Microfinance, Microfin Rural Bank and Cash Point Microfinance.

## **2.0 BUSINESS MODEL OPTIONS**

The business environment is usually driven by the market forces of demand and supply for the purposes of achieving market stability and sustainability in the short to long term. Businesses exist in pursuance of the triple bottom line objectives of; profitability,

social mission and environmental impact. Private sector participation with the above objectives is key to ensure energy efficient and improved stove technologies for fish smoke processing.

The upscale of improved fish smoking stoves in Ghana heavily depends on three key factors namely; the business [MSMEs providing improved cookstoves], policies/regulation and promotion of the improved cookstoves. (Jeuland and Pattanayak, 2012).

In the past decades, much emphasis have been laid on policies and promotion of improved stoves with little mention of regulation. There has not been much investment into enforcing the protocols and standards as a way of regulating the improved stove market in Ghana. Regulatory Institutions such as the Fisheries Commission, Ghana Standards Authority, and Ghana Energy Commission among others have not been able to effectively enforce industry standards of improved fish smoking stoves as well as quality of smoked fish due to resource constraints.

Development partners on the other hand, partnered with Stove Builders to build stoves on pilot basis at designated demo sites and work towards introducing technologies that are user friendly and with improved health benefits. Harmonisation of industry standards and protocols on improved fish smoking stoves would be necessary to reach scale; as there exist currently separate regulations on improved cookstoves standards with less coordination of the regulatory bodies especially by the fisheries commission.

Government and its development partners have made huge investments in the promotion of improved stoves and the technology developments in Ghana, however the desired market scale has not yet been reached as a result of weakened supply chains. The key lessons learned has been the weakened supply chains due to the lack of participation or involvement of the private sector (stove enterprises) in these approaches in ensuring sustained supply of the improved stoves and the inability of the supply side to identify the business opportunities within the demand created.

The need for a holistic business strategy and model that promotes the involvement of the private sector is essential for upscale of improved stoves in Ghana. This business model options and strategies shall serve as a business guide to Governments, Development partners and businesses that operate along the supply chain of improved stove markets.

## **2.1 Enabling factors for a successful business model**

### ***2.1.1 Market Forces and Dynamics***

The sustainability of any market-led interventions or approaches hugely depend on the level of interaction between the market forces of demand and supply. The market forces of demand and supply greatly interplay within the improved cookstoves market; with the demand side being the End-Users who use the improved cookstoves for their day-to-day processing activities and food preparation, and the supply side being the stove builders and the other business enterprises [MSMEs] who supply the improved fish smoking stoves to the End-Users.

In the past decades, interventions by development partners has focused mainly on demand creation and aggregation for improved cookstoves with little or no efforts toward strengthening the supply side to provide sustainable services to the market. Governments and development partners created the requisite demand through awareness creation and made some attempts to strengthen the supply side through direct subsidies

to both end users and the stove enterprises. Other approaches also included recruitment and training of local construction artisans to construct some assigned numbers of improved cookstoves. However, after the end of the projects, these artisans relapsed as they never saw the opportunity of making good use of the skills as livelihood. The entrepreneurs (Stove enterprise) on the other hand, usually become dormant when the project ends and have to wait until another project is initiated. The resultant effect of this, has been vicious cycle of dependence and a disconnection between demand created and the supply.

Recognising the dynamics of the market is key to ensuring sustainable market for the improved fish smoking stoves in Ghana. Efforts by development partners and government should be geared towards demand creation and aggregation as well as strengthening the supply side by providing capacity building and assistance to stove enterprises to identify the business opportunities within the market. The interferences with the market should be at barest minimum to allow for maturity within the market. Subsidies must not be encourage as it usually disturbs the market dynamics and forces.

Forces of demand [Fish Processors-ability to buy improved fish smoke stove] and supply [Stove builders-MSMEs] represents the aggregate influence of self-interested buyers and sellers on price and quantity of the improved fish smoking stoves offered in a market. In general, excess demand causes prices and quantity of supply to rise, and excess supply causes them to fall.

### **Stimulating Demand**

Demand stimulation encompasses consumer awareness and education, innovative distribution models, capacity building training etc. These enhance access to consumer finance which are critical and mutually reinforcing elements for building and sustaining demand in the improved cookstoves sector.

Other equally important areas such as consumer awareness and education regarding the health, environmental, gender, and economic benefits of improved cookstoves are also key to stimulate demand for improved cookstoves. Yet, convincing people to make the behavioural shift from the use of the traditional stove to an improved fish smoke stove is a major challenge in Ghana. Demand stimulation is therefore necessary to reach scale with improved cookstoves adoption in Ghana.

### **Strengthening Supply**

A key component for enhancing the adoption of improved cookstoves involves ensuring sufficient supply of the products that targeted beneficiary end-users and other customer's value at a price they can afford. Strengthening the supply chains of improved cookstoves is necessary to match up the stimulated demands. Weakened supply chains will cause a collapse within the market if demand for the improved cookstoves is not met.

Strengthening supply chains includes; ensuring sufficient capital for businesses engaged in the production and supply of improved cookstoves, research and development into improving the designs and outputs of the stoves, gathering better market intelligence, creating the market linkages between demand created and the supply side and involving women in the value-chain.



## The Market Dynamics

The market dynamics describes the relationship between demand and supply in ensuring market equilibrium (sustainability). When the improved fish smoking stove market is allowed to mature, it creates a sustainable of market environment with price stability. The market equilibrium is a situation in which the supply of an improved fish smoking stove is exactly equal to its demand [fish processors interested in the improved fish smoking stove technologies]. Since there is neither surplus nor shortage in the market, price tend to remain stable in this situation.

To reach scale with improved fish smoke stove adoption and use, government and its development partners have to work towards creating an enabling environment for a sound market. The market forces and dynamics (Figure 2) cannot be completely over looked if market sustainability is expected to be achieved.

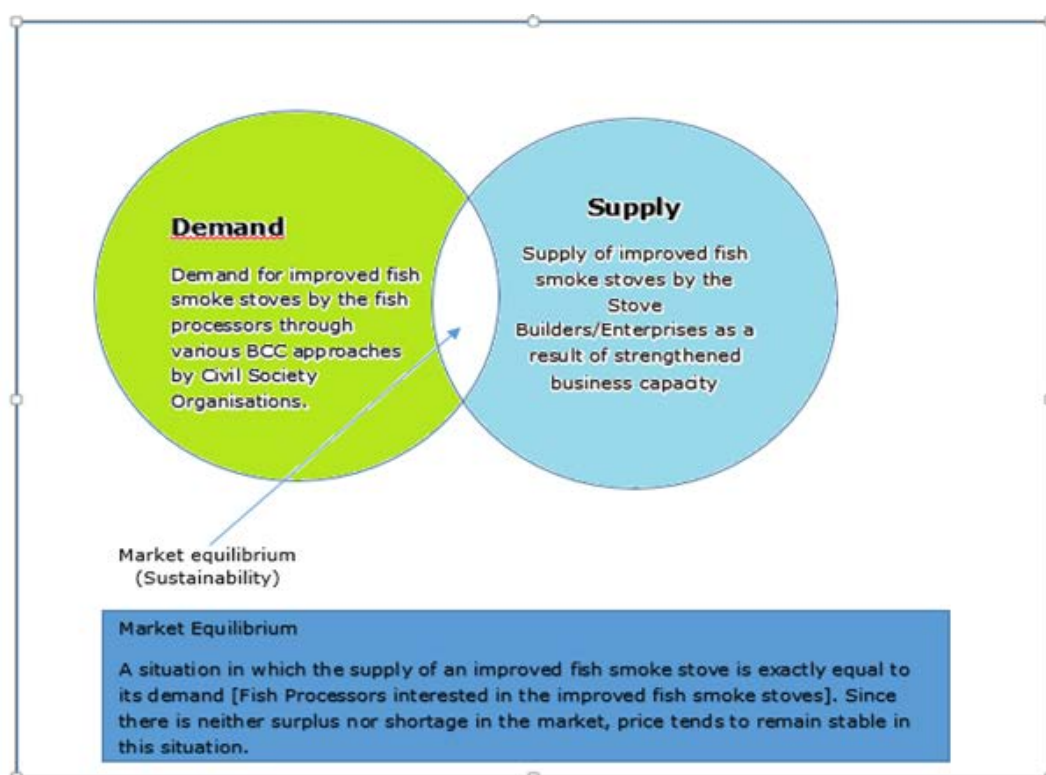


Figure 2: Market Forces and Dynamics

### 2.1.2 Business Enabling Environment

Businesses like humans, must operate within an environment that fosters growth and sustainability. Businesses do not exist in a vacuum and hence need the requisite enabling environment to grow or otherwise. The business enabling environment includes; norms and customs, laws, regulations, policies, international trade agreements and public infrastructure that either facilitate or hinder the movement of a product or service along its value chain. <sup>ii</sup>

To ensure inclusive and effective upscale of the improved fish smoking stoves adoption and use in Ghana, it is important for SFMP and other projects to consider both internal and external marketing environment that would potentially drive and trigger the necessary demand and supply chains.

The business enabling environment also entails the provision of advisory services to government on inclusive policy formulation to stimulate and catalyse the private sector

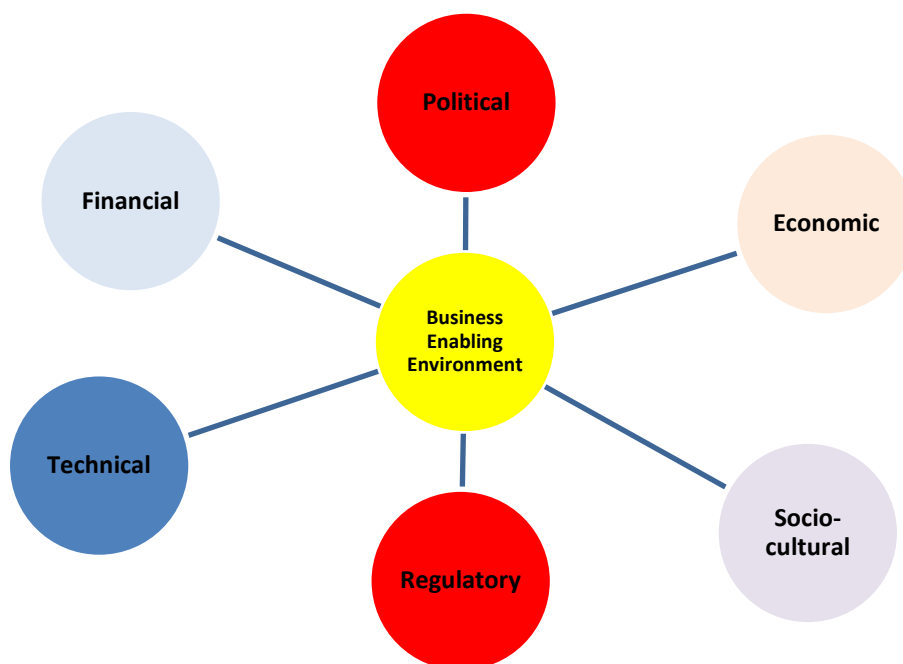
involvement in enhancing the supply of improved fish smoking stoves in Ghana. The establishment of market intelligence/information and quality standards by way of ensuring environmental standards would harness the enabling environment for Public Private Partnerships (PPP).

The effective implementation of business strategies and models hinges on sound internal and external business environment. The enabling environment must be assessed in relation to political, financial, technical, regulatory, socio-cultural and economic environment. The creation of enabling business environment is very important to the improvement, upscale and use of improved fish smoking stoves in Ghana.

In this context of the business strategy determination and model development for the upscale of improved fish smoking stoves in Ghana, the role of the private sector cannot be overlooked by development partners and government. The creation of an enabling business environment through reforms, is an important pre-requisite for unleashing a private sector response that leads to dynamic growth, employment and income generation. This makes the stove business a sustainable livelihood activity for the private sector.

Fostering an enabling environment for a thriving clean cookstoves and fuels market through the development of appropriate structural conditions and empirical guidance is crucial for advancing the sector. However, building such a framework often entails a range of activities that can be prohibitively expensive for any one stakeholder to undertake, and are best suited for a collaborative process involving a variety of stakeholders and related skills. (Cordes, L., 2011).

The business enabling environment (Figure 3, Table 1) hinges on six key control environments namely; political, economic, socio-cultural, regulatory, technical and financial environments. These control environments are inter-twined and have strong interdependencies and hence ensuring the balance between all the control environments would facilitate sustainable businesses in the improved fish smoke stove market.



**Figure 3: Business Enabling Environment for Upscale of Improved Fish Smoking Stoves**

**Table 1 Business Enabling Environment Expanded**

<b>Business enabling environment</b>	
Political	<p>This involves how and to what degree a government intervenes in the economy. It hinges on the political will to promote the agenda of improved cookstoves by Government through its designated Ministries and Departments with specific emphasis on;</p> <ul style="list-style-type: none"> <li>-policy formulation on renewable energy and improved cookstoves;</li> <li>-inclusive policy formulation;</li> <li>-awareness creation on the existing policies through public education;</li> <li>-promotion of healthy fish campaign;</li> <li>-support renewable energy enterprises/business through tax incentives and other forms of support.</li> <li>-development of effective monitoring systems to ensure compliance with regulation.</li> </ul>
Economic	<p>This has significant impact on business and ultimately the profit. It concerns with the direct economic factors that facilitate successful business promotion in Ghana.</p> <ul style="list-style-type: none"> <li>-Disposable income of the fish processors and the nature of their businesses;</li> <li>-market opportunities and access through demand creation and energy gap.</li> <li>-Stimulation of the private sector to invest in improved stoves.</li> </ul>
Financial	<p>This concerns with the provision of sustainable financing for the upscale of improved cookstoves for end-users and MSMEs. The specific emphasis is on financing models that take into cognisance the bottom of the pyramid (BOP) - the poor majority.</p>
Technical	<p>This element concerns with/takes into consideration the technical design of the product to the End-User that meet required standards and specification, with specific emphasis on;</p> <ul style="list-style-type: none"> <li>-user friendly technologies</li> <li>-does not violate existing regulations and laws</li> <li>-Contextualised solutions that is localised</li> <li>- The technology having resemblance of the old stove to allow for easy adaptability by the End-Users.</li> </ul> <p>Technological factors affect marketing and the management thereof in three distinct ways:</p> <ul style="list-style-type: none"> <li>New cost effective ways of producing the cookstoves</li> <li>New ways of distributing the cookstoves</li> <li>New ways of communicating with target markets [fish processors]</li> </ul>

Regulatory	<p>Regulatory environment is concerned with the regulatory environment that promotes business growth and successful upscale of the improved cookstoves in Ghana. This includes fulfilling all issues with the regulatory authorities to ensure that;</p> <ul style="list-style-type: none"> <li>-the improved cookstoves meets regulatory standards;</li> <li>-the improved cookstoves successfully passed all tests and has low PAH;</li> <li>-the improved cookstoves is approved by Environmental Protection Authority and Ghana Standards Authority;</li> <li>-standard testing protocol is developed for testing the improved cookstoves;</li> <li>-Fisheries Commission has approved the technology for upscale.</li> </ul> <p>It also touches on aspects of legal factors such as; health and safety standards, equal opportunities, advertising standards, consumer rights and laws, product labelling and product safety. All these are necessary to create the requisite enabling environment for adoption of improved cookstoves.</p>
Socio-cultural	<p>This is also known as social factors and focus on the areas that involve the shared belief and attitudes of the Fish Processors and their respective fishing communities. These factors include – population growth, age distribution, health consciousness, career, attitudes and so on. These factors are of particular interest as they have a direct effect on the promotion and adoption of improved cookstoves.</p>

### **Business Sustainability Framework**

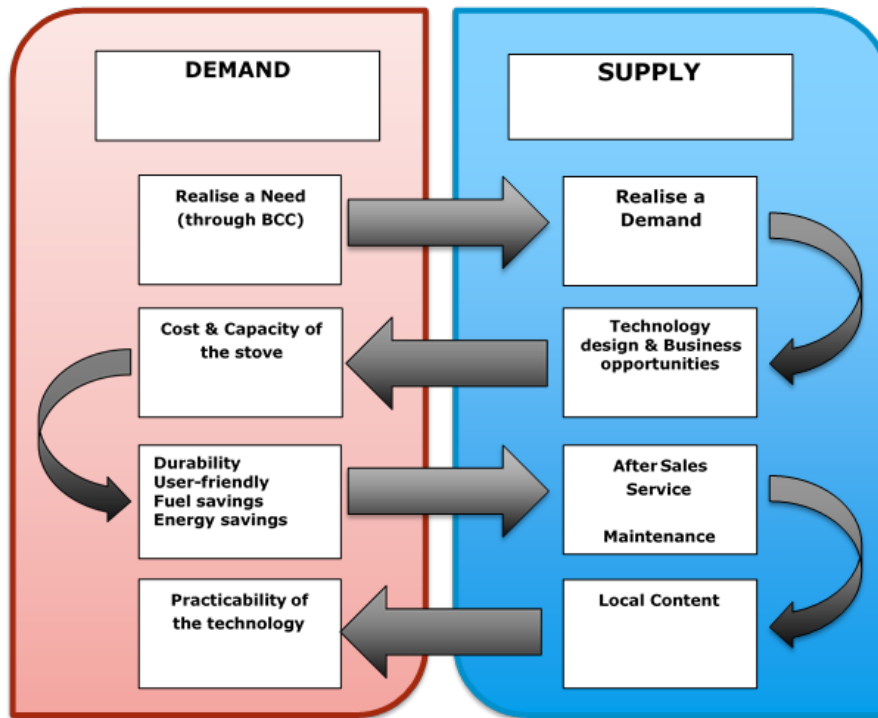
The business sustainability framework creates a long-term investment /shareholder value for MSMEs engaged in the production and supply of improved fish smoking stoves. This is to enable them embrace the business opportunities and management of risks that is likely to result from economic, environmental, and social responsibilities. It provides a clear business case for the supply side to identify initial business opportunities and capitalise on the demand created by development projects that focused on awareness raising.

The supplier would have to see the business opportunities in providing the technology option for the demand side and also assess the level of profitability as well as return on investment.

Today’s energy access dynamics present a unique opportunity to further catalyse private sector action in the commercially viable portion of the energy access market, while focusing public resources on populations that cannot realistically be served by businesses. Given that people are currently spending a significant portion of their incomes—often 10 percent or more each month—on basic energy needs, this is a proven, cash-based market. It is also, therefore, a huge opportunity for firms to be able to develop the right business models to capture it. (Bardouille, P., 2012).

Businesses engaged in the production and supply of improved fish smoking stoves clearly have different preconditions for commercial successes which mainly depend on the technology and position along the value chain of improved fish smoking stoves. Three factors that stand out for the improved fish smoke stove markets are; making the products affordable, contextualising the product design (localise the design of the product in consistence with what end-users are already used to) and Building, tapping, and financing distribution networks. Businesses attempting to penetrate low income populations must go to the extremes to strip out costs and make product prices as low as

possible using the penetrative pricing strategy to gain market share. Design innovation, supply chain efficiencies, and distribution are all areas for cost reduction. Another aspect of keeping cost very low is to develop very simple designs of improved fish smoking stoves, use of local raw materials and also leverage on local artisans available within operational areas.



**Figure 4: Business Sustainability Framework**

The business sustainability framework (Figure 4) revolves around a holistic pathway that links demand with supply in a sound business environment with the end-users realising a need through to practicability of desired need. The Fish processors acting as the demand side of the market would have to realise a need and then the supplier would also have to also realise demand created to trigger production levels. The demand side would also consider the cost of the product [improved cookstoves] in relation to its affordability and capacity of the stove relating to the number of processing trays the stove can handle at a go. The supplier would in turn consider technological options and clearly identify the business opportunities taking into account the market potential and share.

### **The Business Model**

To reach scale with adoption and use of improved fish smoking stoves in Ghana, a market oriented business model is required. Several business models have been developed in the past by government and development partners geared towards upscaling improved cookstoves.

A number of these models were not sustainable and did not create much room for private sector and government participation. For an effective and sustainable business model, all the major actors within the improved cook stove value chain would have to be recognised. To reach scale, the role of government and financial institutions in linking the demand and supply cannot be overlooked.

The distinctive roles of Government and Financial institutions in demand creation and strengthening the supply chain must be recognised to upscale improved fish smoking stoves in Ghana. To reach scale, the diamond business model is proposed as a holistic model that seeks to bridge the gap between demand and supply by creating the required enabling environment for increased access to improved fish smoking stoves and sustainable businesses.

The diamond business model (Figure 5) has been developed with adaptation from Michael Porter's diamond of national advantage. The diamond business model provides a clear sustainable business pathway that creates and strengthens the market linkages among the beneficiary end-users, the business (builder/supplier of improved cookstoves), financial institutions, government and civil society organisation.

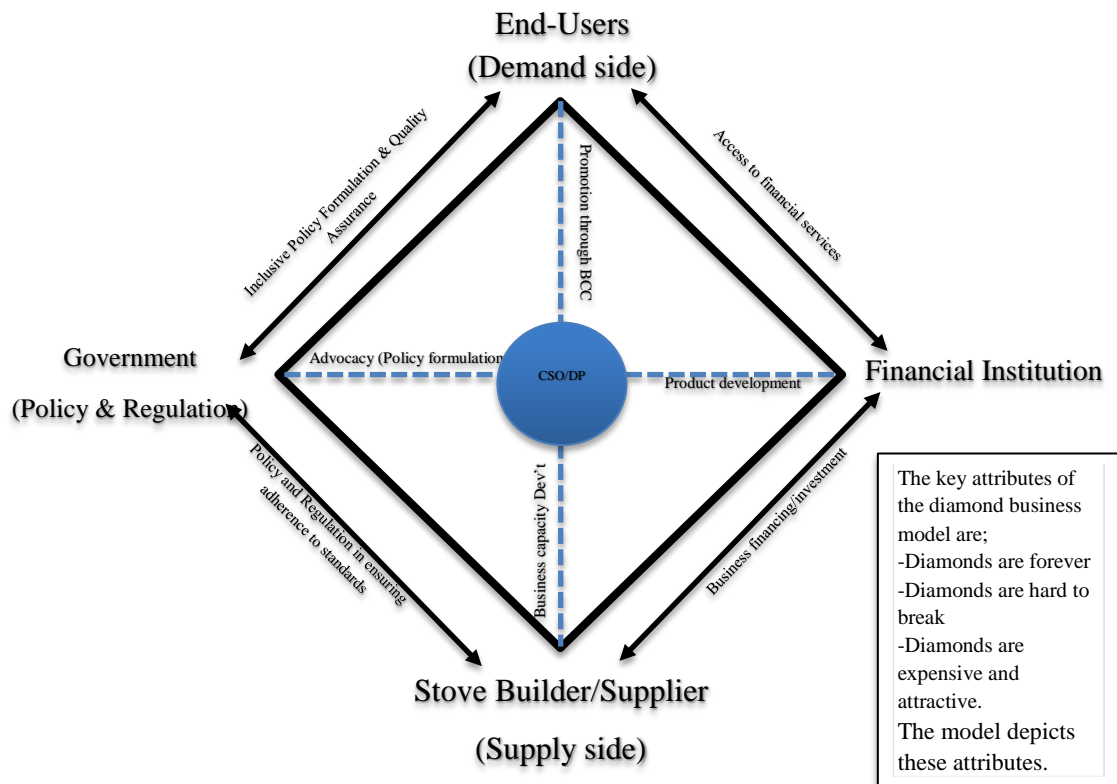
The model is an inclusive business model that identifies and provides clear understanding of the dynamics within the market in reaching scale. The model for instance, spells out the specific role of Development partners and civil society organisations in linking demand created with supply via government and financial institutions.

The model places the development partners/CSOs at the heart of the diamond which signifies the pivotal role of the development partners/CSOs in ensuring upscale of improved cookstoves.

The model provides a framework of interdependencies among the major actors within the improved cookstoves market.

For successful upscale, the model recognises the unique internal and external factors such; inclusive policy formulation on improved cookstoves, harmonised national standards and protocols, regulations to ensure adherence to standards, and access to financial services (credit) for end-users. It also includes; financing for improved fish smoke stove enterprises to scale up business operations, business capacity development for the enterprises, and promotion of improved fish smoking stoves using behaviour change communication approaches and advocacy on inclusive policy formulation.

A combination of these factors would ensure sustainable businesses to reach scale.



**Figure 5 Annotated Diamond Business Model**

### End-users

The End-users are the final beneficiaries of the improved fish smoking stoves and this could be fish processors, households and other agro-processors. The adoption and use of improved fish smoking stove by these segment of actors is key in reaching to scale. To change the behaviour towards the adoption and use of improved fish smoking stove can be successful through the use of BCC approach.

The role of the development partners/CSOs in promoting the adoption and use of improved cookstoves using BCC approach is central to the diamond business model. (Table 2).

### Government

Government through its established Ministries, Departments and Agencies are expected to enact policies and build regulatory framework to foster the adoption and use of improved fish smoking stoves. Government's policies and regulatory frameworks are expected to create an enabling environment for the businesses to produce improved fish smoking stoves in consistence with national standards within reasonable cost. Government can also provide tax incentives such as tax holidays, import duty exemption and reduction in corporate tax rate for the businesses engaged in producing/supply of improved fish smoking stoves. Governments on the other hand would have to create the financial enabling environment for financial institutions to actively participate in the improved fish smoking stove market financing through the provision of on-lending funds and some incentives for financial institutions that provides credit towards financing improved fish smoking stoves. Government is also expected to promote improved fish smoking stove and create an avenue for inclusive policy formulation of improved fish smoking stoves to build end-user confidence.

## **Financial Institutions**

The diamond business model also hinges on the effective participation of financial institutions in the provision of inclusive financial products.

Financial Institutions through development and deployment of inclusive financial products are expected to on-lend to end-users and enterprises to strengthen the demand and supply chains. The provision of financial services such as loans and other savings-led products in financing the purchase of improved fish smoking stove will contribute to reach scale. Development partners/CSOs can assist the financial institutions to understand the market dynamics and also provide technical support to develop appropriate target oriented financial products for both the end-users and enterprises. The Financial Institutions through micro-loans can link the demand and supply chains of the market.

## **Stove builders and suppliers**

The stove builders and suppliers on the other hand can't be left out of the diamond business model as they represent the supply side of the market. They form the foundation on which all other actors hinge on and operate within the model. The stove builders/suppliers are expected to build their internal capacity in relating to all the other actors within the model. The builder/enterprise must provide innovative technological options that meet international and national health standards and other protocols. The market within this model is built around the stove builder/enterprise and must have a business and profit motivated mind-set coupled with a social and environmental mission. Development partners/CSOs should partner with financial institutions to establish on-lending wholesale funds to the end-users and businesses engaged in production of improved fish smoking stoves. This financing model can facilitate increased adoption and use of improved fish smoking stoves as well as strengthen the businesses.



**Table 2: A matrix of the Role of Development Partners/Civil Organization in the Market Linkages within the Diamond Business Model**

	<b>Stove Builder</b>	<b>Financial Institution</b>	<b>End-Users</b>	<b>Government</b>
<p>Development partner/Civil Society Organisations (Key role is to facilitate the market linkage processes)</p>	<p>The development partners/CSO key role is to develop the business capacity of the stove builders in the areas;</p> <ul style="list-style-type: none"> <li>-Sound business management practices</li> <li>-Technical support in improving the quality and standards of the stoves;</li> <li>-Assist with the promotion of the technology to the end-users;</li> <li>-Facilitate the linkages with financial institutions, government and fish processors.</li> </ul>	<p>The development partners/CSO key role in their relation with the financial Institutions is to;</p> <ul style="list-style-type: none"> <li>-Provide technical support in the development of financial products for financing end-users and businesses;</li> <li>-Provide access to less costly funds for on-lending to end-users and businesses within the improved cookstoves markets;</li> <li>-Provide business capacity development support in renewable energy financing;</li> <li>-Facilitate the linkages between the Stove Builders, enterprises and the fish processors;</li> <li>-Facilitate business financing for the Stove Builders and enterprises;</li> <li>-Facilitate linkages between the Stove Builders, enterprises and Financial Institutions;</li> <li>-Facilitate the linkages between the Stove Builders and Government to ensure compliance with standards and existing regulation.</li> </ul>	<p>The key role of the Development partners/civil society organisation in their relation with the End-Users is to;</p> <ul style="list-style-type: none"> <li>-Create the needed awareness on the dangers of using traditional stoves and benefits of using improved cookstoves.</li> <li>-Promote the improved cookstoves technologies;</li> <li>-Provide business capacity development for the fish processors (small business management);</li> <li>-Facilitate the formation and strengthening of solidarity groups among the fish processors</li> <li>-Facilitate linkages between the fish Processors and Government to enhance inclusive policy formulation on renewable energy;</li> <li>-Facilitate access to financial services in enhancing financial inclusion;</li> <li>-Facilitate the development of commodity value chains.</li> </ul>	<p>The key role of the development partners/CSOs in their relation with Government is to;</p> <ul style="list-style-type: none"> <li>-Collaborate with Government to develop inclusive policies on improved cookstoves;</li> <li>-Provide technical support in the development of standard protocols for assessing the health impact of the stoves;</li> <li>-Advocate for implementation of policies on improved cookstoves technologies and use;</li> <li>-Facilitate to ensure certification of the improved cookstoves for large scale production;</li> <li>-Provide technical assistance to ensure effective monitoring and adherence to quality standards of the improved stoves;</li> </ul>

### 3.0 STRATEGIES TO REACH SCALE

In the past decades, various strategies have been employed by governments and development partners in developing countries which attracted huge investments into promotion of improved cookstoves. In spite of the huge investments sunk into implementation of the strategies, little has been achieved with regards to adoption of improved cookstoves. The demand for improved cookstoves in Ghana is not yet sufficient to trigger the requisite levels of adoption and use anticipated.

To ensure increased adoption of improved fish smoking stoves in Ghana, there must be innovative and sustainable business strategies. In light of this, the business strategies required to harness smooth and effective implementation of the diamond business model are; Promotional, Marketing, Financing and Pricing. (Figure 6). These four (4) key business strategies are necessary in ensuring the success or failure of the diamond business model.

The business strategy tree provides a diagrammatic explanation of the strategies necessary for upscaling improved cookstoves and especially improved fish smoking stoves.

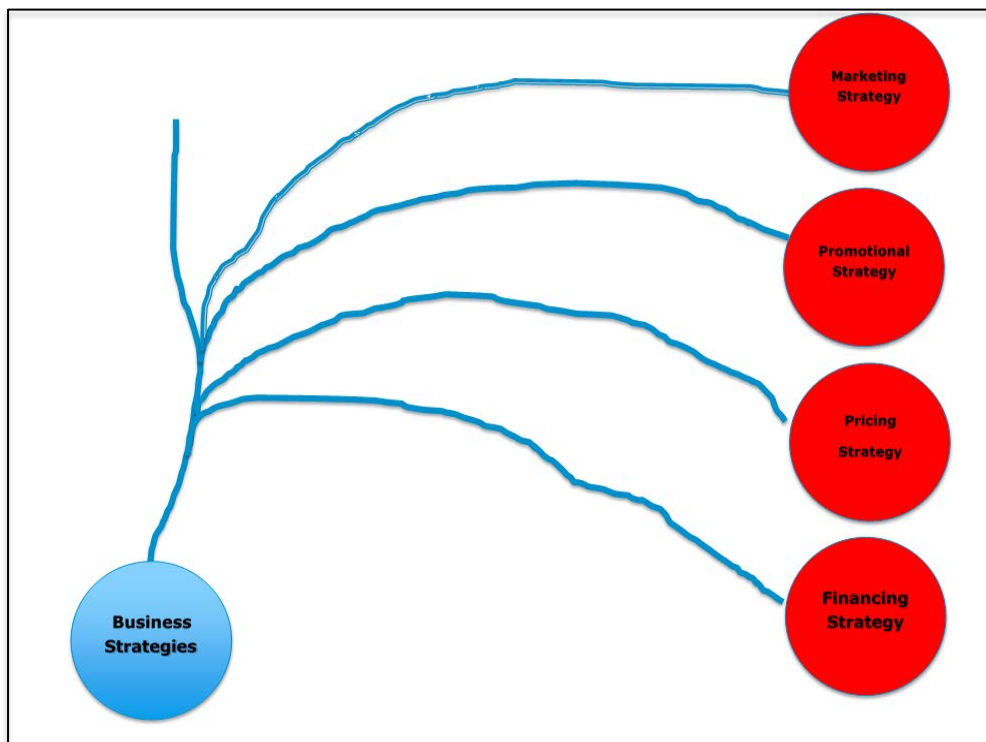


Figure 6: Business Strategy Tree

#### 3.1 Promotional Strategy

Promotion of improved fish smoking stove is necessary to enhance adoption and use by targeted end-users. Promotion helps transmit key information to targeted beneficiaries on the benefits of the improved fish smoking stoves and the hazards associated with the use of traditional fish smoke stoves. Promotion is the fundamental strategy of a business to reach scale.

There exist within the renewable energy industry various ways through which businesses, Institutions and Civil Society Organisations promote the adoption, acquisition, sale and use of improved fish smoking stoves in Ghana. Most of these efforts are geared towards triggering individuals and communities to shift from the traditional fish smoke stoves to the improved fish smoking stoves mainly on the grounds of health and energy savings. However, not much

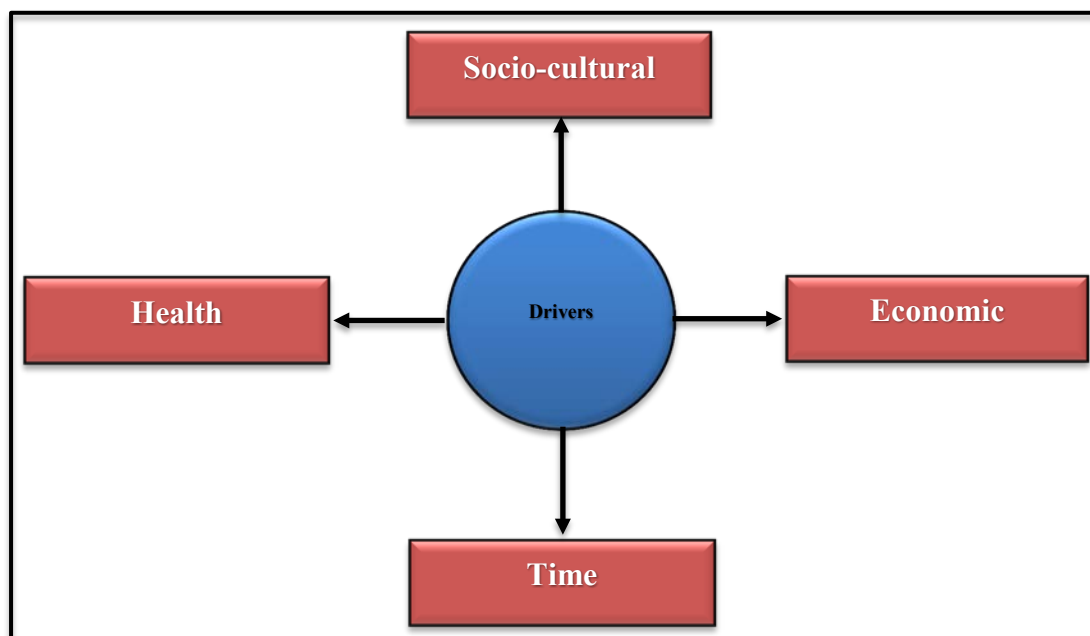
attention has been paid to other aspects of promoting the adoption and use of improved cookstoves.

Despite the huge investments sunk into the development and distribution of IEC materials, the desired behaviour change has not been achieved. Government and its development partners have committed much resources into promoting adoption and use of improved fish smoking stove on a large scale; however this has not yielded the results expected.

To improve upon the on-going promotional strategies by development partners and government, promotion of improved fish smoking stoves must be complemented with behaviour change communication strategies. Promotion alone with IEC materials is not enough to trigger desired change towards the adoption and use of improved cookstoves and improved fish smoking stoves by the fish processors.

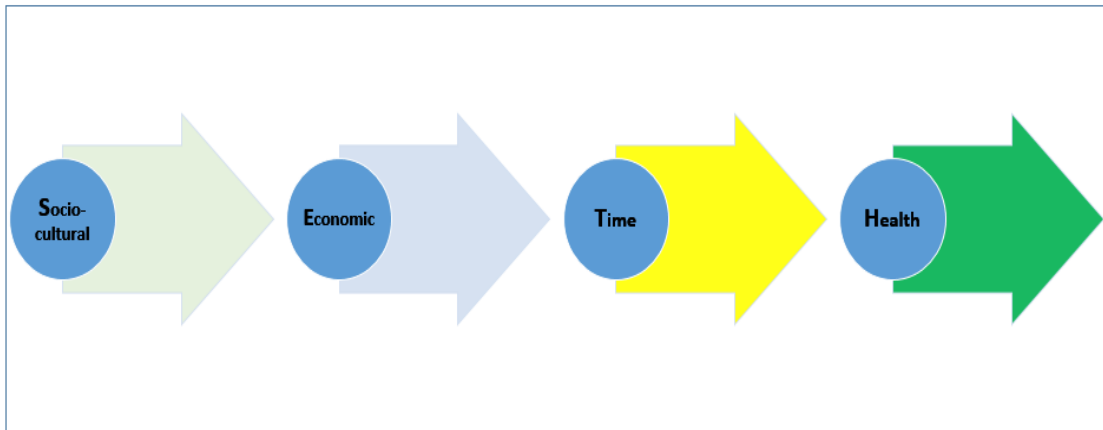
### **3.1.1 The Social -Economic -Time and -Health (SETH) Model**

The SETH Model is recommended as a holistic approach for the promotion of improved cookstoves coupled with BCC models. The SETH model focuses on four (4) key drivers in promoting adoption and use of improved cookstoves in Ghana especially for improved fish smoking stoves (IFSS). The SETH model assumes that, promotion of improved cookstoves must be on the grounds of the following benefits; Socio-cultural, Economic, Time and Health. The costs and benefits of improved cookstoves are most affected by their relative fuel costs, time and fuel use efficiencies, the incidence and cost-of-illness of acute respiratory illness, and the cost of cooking time. The SETH model provides a holistic approach to effective promotion of improved cookstoves. Promotional messages and materials on improved fish smoking stoves must be centred on the four key drivers. Figure 7 and 8 provide details on the SETH Model.



**Figure 7: SETH Model**

The SETH model process path of penetration provides a guide to effective promotion of improved fish smoking stove beginning with socio-cultural benefits and exiting with the health benefits to complete the cycle of conviction of the targeted end-users to adopt the improved cookstoves. In general most of the promotional messages on the improved fish smoking stoves have keenly highlighted the health and economic benefits.



**Figure 8: The SETH Model Process Path of Penetration**

### **Socio-cultural driver**

Socio-cultural factors play a major role in changing behaviours of individuals and the society in general. For effective promotion, socio-cultural benefits of the improved fish smoking stoves must be strongly highlighted. For promotion on grounds of socio-cultural drivers, the behaviour change communication messages must dwell on social values and norms of the society. This is because traditions and culture may have influence on the targeted beneficiary way of life and economic activities. For pervasive promotion of improved fish smoking stoves, the socio-cultural context underlying the operations of the Fish processors cannot be ignored; as this refers to the wider social and cultural setting in which the activities of the Fish Processors is embedded in.

Fish smoke processing is a transgenerational occupation which has been passed on to the current generation, and adoption of certain practices must be in line with the cultural belief system of the community. To break the socio-cultural barriers to the adoption of the improved fish smoking stoves, the following would have to be considered;

- Encourage community participation in the development of the product designs.
- Use early adopters to lead the promotion of the improved fish smoking stoves.
- Use the custodians of the societal belief system such as chiefs, opinion leaders, community gatekeepers and queen mothers to promote adoption of the new and improved technologies of fish smoke stoves.
- The positive deviance approach should also be used.

To cause the desired shift among the targeted beneficiaries from the traditional way of doing things to the ideal behaviours, promotion must touch on socio-cultural sentiments. The promotion of improved fish smoking stoves and other improved cookstoves must lay much emphasis the following:

- It is prestigious for a fish processor to own and use an improved fish smoking stove within the community;
- It symbolises wealth for the social class;
- It makes one feels modern and respected among his/her peers.
- It is not a taboo to change the stove your parents passed-on to you; the gods of the land will not punish anyone who desire to change the fish smoke stove, the chief fisherman and konkohemaa approve of the improved fish smoking stove and
- The chief and opinion leaders approve of the improved fish smoking stoves.

These socio-cultural drivers would motivate people to change positively towards the ideal behaviour of switching from the use of traditional stove to improved stove. The socio-cultural driver within the SETH model is essential, as it tackles aspects of social values and societal norms in the context of improved stove adoption and use.

Successful use of social behaviour change communication messages will trigger demand for a change; that is a shift from the traditional fish smoke stoves to the improved fish smoking stoves.

### **Economic drivers**

The economic drivers within the SETH model represents the direct financial and economic benefits end-users would derive from the use of an improved fish smoking stoves over the traditional stove. The economic driver hinges on increased production capacity, quality and cost savings expected to be made on the improved fish smoking stoves and how that translates into financial returns to the end-users. It also cruxes on production volumes and profit maximisation.

The key behaviour change communication messages on economic drivers should be as follows:

- Consumes less fuel wood;
- Increases profit margin through savings made on the fuel wood;
- Enhances product quality;
- Increases production capacity and volumes and
- Reduced expenditure on fuel wood

Promotional messages and activities must be able to correlate the direct relationship between fuel savings and impact on profit margins.

### **Health Driver**

The health drivers relate to the direct health benefits end-users would derive from the use of an improved fish smoking stoves. Research has proven beyond reasonable doubts that, the health benefits of using improved fish smoking stove are enormous. Promotional messages on the health drivers should stress on the following:

- The improved fish smoking stove minimises contact with smoke which cause cancer;
- It also ensures healthy fish as it reduces the PAH content within the fish and
- It protects the eye from contact with smoke as continuous eye contact with smoke is among the leading cause of eye diseases.

### **Time Driver**

The time driver focuses on the time savings associated with the use of improved cookstoves which can be channelled into other productive activities. Promotional messages on the time driver should stress on the following;

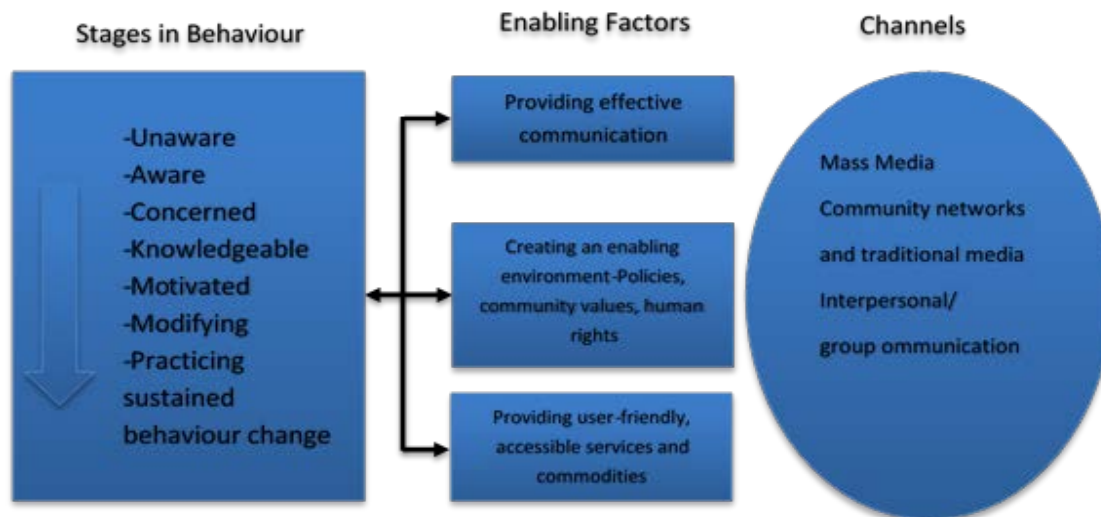
- The improved fish smoking stove processes faster than the traditional stoves.
- The processor would have time to do other household chores.

### **3.1.2. Behaviour Change Communication models for promoting adoption and use of improved cookstoves**

There are several BCC models developed in the past decades to aid with behaviour change. To reach scale, it is important for promotional activities to centre on behaviour change

communication models appropriate to trigger the needed change towards the adoption, ownership and use of improved stoves for fish smoke processing in Ghana.

The barriers to the adoption of new technologies such as improved cookstoves are enormous, spanning from cost to socio-cultural issues contributing to low adoption of improved cookstoves. This has contributed to a large extent, the low adoption and use of improved fish smoking stoves in Ghana. A combination of different BCC models will work greatly towards achieving the desired behaviour change.



**Figure 9: Behavior Change Communication Framework**

The behaviour change communication framework (Figure 9) provides a holistic approach to changing behaviour towards adoption of a desired behaviour. The framework provides the stages in behaviour change from the level of unawareness through to the stage of practicing sustained behaviour change. To achieve the desired change, there are enabling factors that fosters a shift in an individual’s behaviour and must be properly taken care of.

### **3.1.3 Behavior Change Models**

A number of behaviour change models have been developed by social development workers, scientist and other professionals to assist with changing behaviours of targeted beneficiaries and individuals.

To reach scale with adoption and use of improved fish smoking stoves and other improved cookstoves in Ghana, the following internationally recognised behaviour change models are adapted; diffusion of innovation theory, health belief model, theory of planned behaviour, ADKAR model and positive deviance approach. Application of these models require a good understanding of the model and requisite community mobilisation and facilitation skills.

#### **3.1.3.1. Diffusion of Innovation Theory**

Diffusion of innovation theory is an important tool for BCC facilitators to know and understand in changing behaviours towards the adoption and use of improved fish smoking stoves. The theory was first developed by E.M. Rogers in 1962 and has be implied extensively in behaviour change communication globally. It originated in communication to explain how, over time, an idea or product gains momentum and diffuses (or spreads) through a specific population or social system.

### Application of the Model in Promoting Improved fish smoking stoves

This model can be applied in promoting improved fish smoking stoves in fishing communities and specifically SFMP beneficiary communities.

The model can be used to understand how adoption and use of improved fish smoking stoves can gain momentum and diffuse through fish processors in Ghana. The end result being that the fish processors, as part of a social system, adopt and use improved fish smoking stoves in ensuring healthy fish.

Adoption means that the fish processor owns an improved fish smoking stove. The key to adoption is that the fish processors must perceive the idea, behaviour, or the improved stove as innovative. It is through this that diffusion is possible. The adoption of an improved fish smoking stove (i.e., "innovation") would not transpire simultaneously in a social system; rather it will take a gradual process whereby some of the fish processors will be more apt to adopt the innovation than others.

When promoting improved fish smoking stoves to fish processors or any target population, it is important to understand the characteristics of the fish processors or target population that will help or hinder adoption of the improved stove.

Rogers identified five types of adopters (Figure 10). Their characteristics are summarized in Table 3.

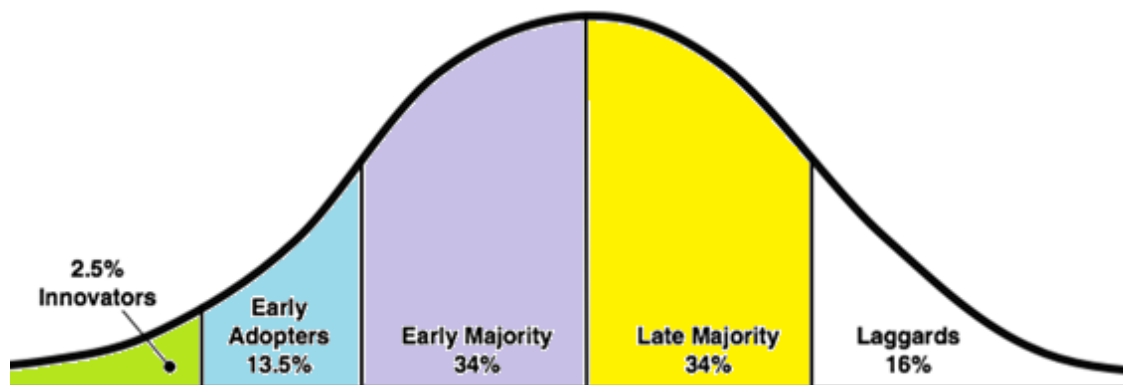


Figure 10: Diffusion of Innovation Theory

Source: Adapted from Rogers, 2003.

**Table 3 : Detailed Explanation of Diffusion of Innovation Theory**

Innovators	These are segments of fish processors/people who want to be the first to try the improved stove. They are venturesome and interested in new ideas. They are very willing to take risks, and are often the first to develop new ideas. Very little, if anything, needs to be done to appeal to this population. The innovators usually constitute 2.5 percent of the target population. They are sometimes referred to as the gatekeepers of an innovation.
Early Adaptors	These are segments of fish processors/people who represent opinion leaders and role models that majority of fish processors seek advice from. For example the leaders of processor associations/groups, konkonhema, the wife of the chief fisherman, Queen mother of the community etc. They enjoy leadership roles, and embrace change opportunities. They do not need information to convince them to change. They also constitute 13.5 percent of the target population.
Early Majority	These segments of the processors/people are rarely leaders, but they do adopt new ideas before the average person. That said, they typically need to see evidence that the innovation works before they are willing to adopt it. Strategies to appeal to this population include success stories and evidence of the innovation's effectiveness.
Late Majority	These are segments of the processors/people who are sceptical of change, and will only adopt the improved fish smoking stove after it has been tried by the majority. Strategies to appeal to this category of processors include information on how many other fish processors have tried and tested the improved stoves as well as its associated benefits inconsistency with the SETH model.
Laggards	These segment of fish processors/people are bound by tradition and very conservative. They are usually very sceptical of change and are the hardest group to bring on board. Strategies to appeal to this segment of the processors include records on impact, fear appeals, video documentary, IEC materials and pressure from peers within the other adopter segments.

The stages by which a fish processor adopts an improved fish smoking stove (innovation), and whereby diffusion is accomplished, include awareness of the need for an improved fish smoking stove (innovation), decision to adopt (or reject) the innovation, initial use of the innovation to test it, and continued use of the innovation.

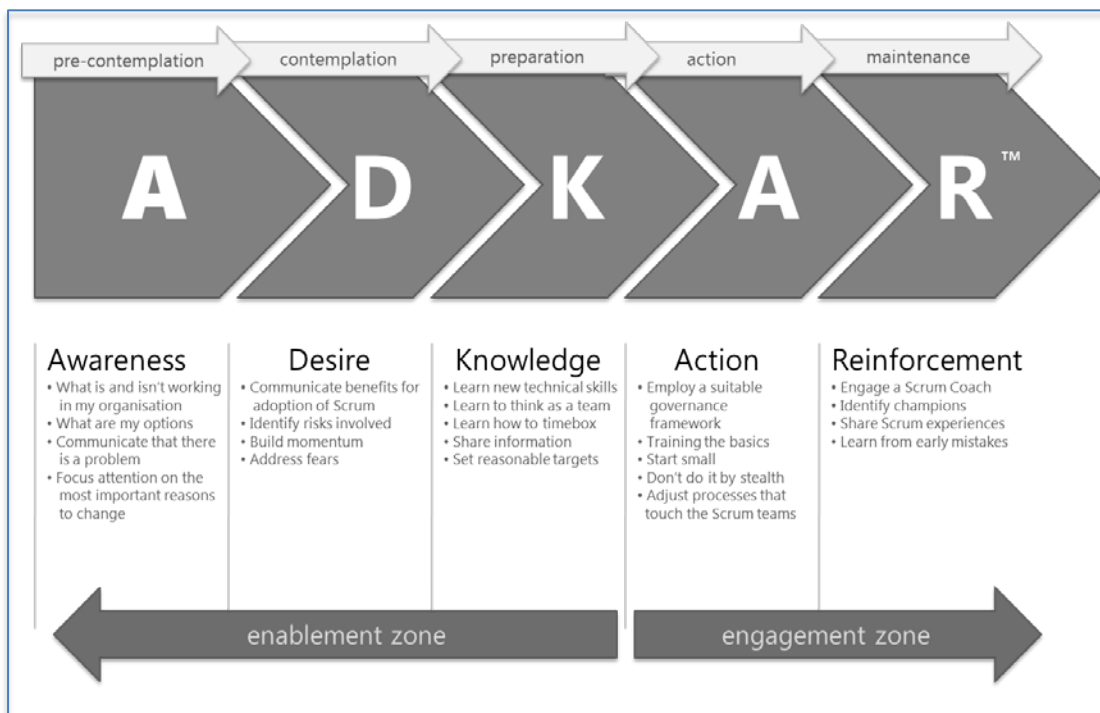
To reach scale, it is important to target the early adopters and strategies should be tailored towards getting the early adopters on-board as agents of change.

### *3.1.3.2. The ADKAR Model*

The ADKAR model is a framework for understanding the dynamics of change at an individual level. (Figure 11) It focuses on change at an individual level, and the specific



needs of that individual in order for that person to change his/her behaviour towards the desired ways of working. The model was developed by Jeff Hiatt of Prosci research in 1998 and was initially used as a tool for determining if change management activities were having the desired results during organisational changes.



**Figure 11: The ADKAR Model**

It is widely used to help identify and drive change whilst also being used as a tool to understand any gaps that are needed to strengthen along the change process.

The key elements of the ADKAR model are awareness, desire, knowledge, ability and reinforcement. Each element of the ADKAR change management model must thoroughly be completed and should also be followed in a sequential order for successful change to take place.

### **Application of the ADKAR Model in promoting improved fish smoking stoves.**

To reach scale, the ADKAR model can also be utilised as a BCC strategy to trigger a change to adoption and use of improved fish smoking stoves in Ghana. The ADKAR model perfectly works with the diffusion of innovation theory approach to adoption of improved fish smoking stoves. Combination of the two BCC models is necessary to reach scale with improved fish smoking stoves.

The ADKAR model hinges on the individual's awareness of innovations and benefits, followed by the desire for a change, knowledge of how to change, ability to make the desired change and reinforcement once the innovation has been tested with the requisite support to maintain the new behaviour.

The steps involved in the application of the ADKAR model:

#### **Step 1: Awareness**

Create an understanding for the need to change by way of sensitising the fish processors on why the change is necessary. The next step is to assess the current situation in terms of what is happening and why it is happening (how they process smoke fish for the market).

The facilitator needs to assist the processors to respond to the following questions;

-What is wrong with what we are doing today? That is Identification of the problem with regards to fish smoke processing using the traditional stoves.

-What will happen if we don't change? ; Consequences of not embracing the desired change and its impact on the economic and social life of the processors as well as their returns on investments (sales and profit margins).

-What is in it for the individuals? ; The motivation for adopting the desired behaviour for an individual fish processor within a community.

As soon as individuals become aware of an impending change, they begin to look for answers to explain why change is needed. The awareness element also includes information about the internal and external drivers responsible for creating the need for change, and the motivation. It is important for the SFMP partners to communicate the business need for the change [adoption and use of an improved fish smoking stove], and explain the reason for the change [it is important to explicitly use the SETH model to explain why the change is necessary]. The risk of not changing must also be communicated to the fish processors.

### **Step 2: Desire:**

The second step involves triggering the fish processors towards desiring for a change. The desire represents the motivation to support and participate in the change and therefore implies personal choice. It is influenced by the nature of the change, the person's unique situation with respect to the change, and intrinsic motivators that are unique to the person. Merely creating awareness does not create desire.

If awareness is not accompanied by desire for change, critical resistance to change can occur. Effective leading and influencing can go a long way to help people choose to follow and desire change.

### **Step 3: Knowledge**

The third step is to provide the fish processors with the requisite knowledge on how to change if the desire stage has been successfully activated. Knowledge includes the provision of information, training, and education needed for change.

Provide knowledge based materials and information to the fish processors in a language they understand to help them make an informed decision concerning the desire to shift from using traditional stoves to improved fish smoking stoves. The knowledge here includes information about behaviours, processes, tools, systems, skills, job roles and techniques that are needed to implement a change.

It is important for the facilitator to give knowledge so the fish processors can understand the need for a change, how to change and what to do.

### **Step 4: Ability**

At this stage, the capacity of the fish processor needs to be assessed in relation to embracing the desired change. Sometimes the desired change may have cost implications. For the fish processors, some might have challenges with the space to build the stove while others would have challenges with the initial cost of constructing an improved fish smoking stove.

Ability refers to the demonstrated achievement of the change. If the fish processor has ability, the change should be achievable and measurable.

## Step 5: Reinforcement

It is important at the final stage of the change process to reinforce the desired change. Reinforcement is any event that strengthens and builds longevity for the change for an individual or an organization.

The change facilitator should institute a recognition system or a celebration for fish processors that are able to adopt to change from traditional stoves to improved fish smoking stoves. Including reinforcement as part of the change process helps to ensure ongoing success with regards to the change, and can even increase the capacity for subsequent changes by the fish processors.

### 3.1.3.3. Health Belief Model

The health belief model is one of the instrumental models that can be used in awareness creation using BCC. The Health Belief Model is a social cognitive model for effective behaviour change. The model suggests that a person's belief in a personal threat of an illness/disease together with a person's belief in the effectiveness of the recommended health behaviour or action will predict the likelihood that the person will adopt the behaviour.

The Health Belief Model (Figure 12) is a psychological model of behaviour change adapted from Stretcher, V & Rosentock, I.M (1997). It is based on the individuals' perception of acquiring a disease and its severity; analysis of benefits in taking action to reduce the barriers and adopting healthy behaviour and relative cost benefit of adopting a healthy behaviour.

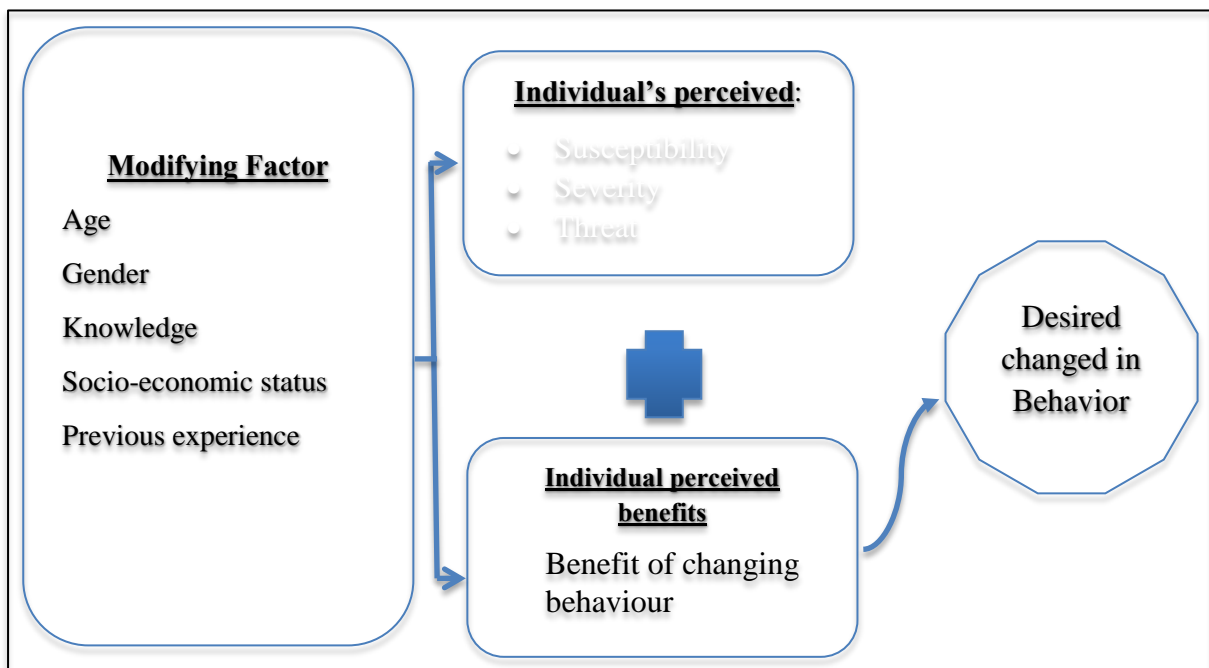


Figure 12: The Health Belief Model

### Application of the Health Belief Model in promoting improved fish smoking stoves.

Application of the health believe model in promoting improved fish smoking stoves is possible as its hinges on the health benefits of using an improved stove and the dangers associated with the use of traditional stoves. The modifying factors underlying the application of the Health Belief Model are; the age of the fish processor, gender, knowledge level, taking into account educational level and level of exposure of the processors on fish processing,

previous experience with regards to adoption of a new technology for the fish processing activities and the socio-economic status of the fish processor.

The modifying factor provides the basis to segment the fish processors in the relay of information on the health threats, risk, susceptibility and severity of using the traditional cookstoves as the levels of understanding might not be the same. Segmenting the fish processors will provide information on the modifying factors to ensure successful application of the model.

The Health Belief Model must be applied within the framework of the SETH model because the promotional messages would be on grounds of health in articulating the perceived risks and other health threats associated with the use of the traditional cookstoves to the end-users. It also requires the development of IEC materials to effectively communicate the health benefits of using improved stoves and the dangers associated with using a traditional stove for fish smoking.

#### **Definition of key words**

**Perceived susceptibility:** The subjective perception of the risk the individual is at from a state or condition.

**Perceived severity:** Subjective evaluation of the seriousness of the consequences associated with the state or condition.

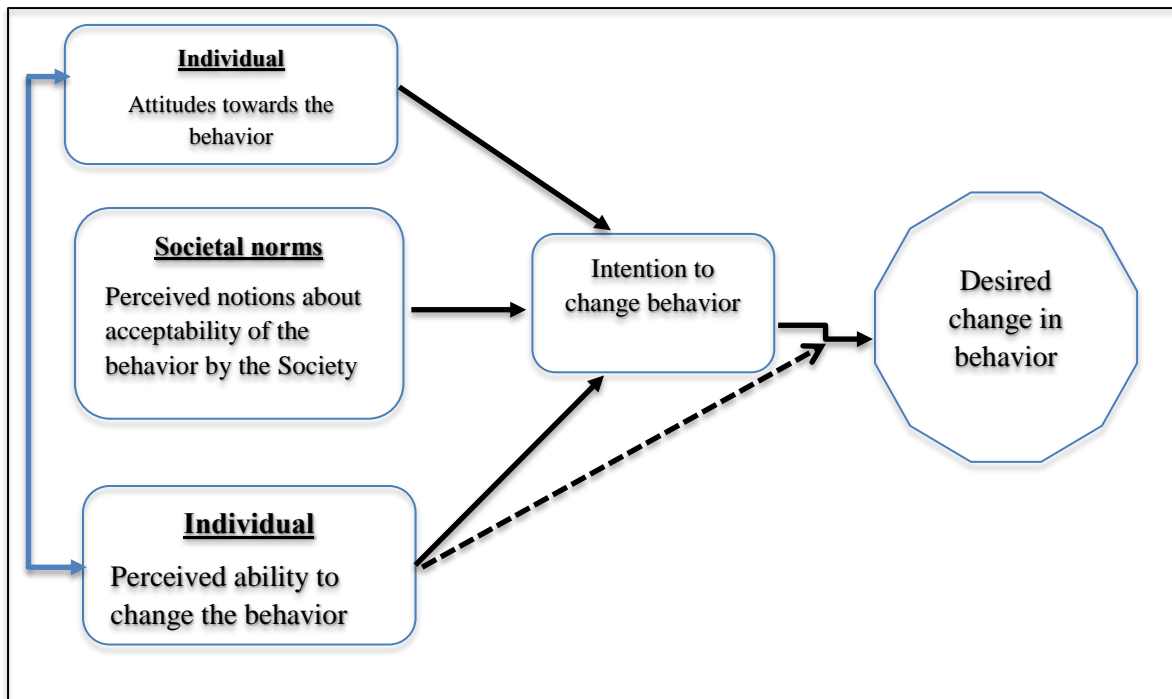
**Perceived benefits:** The subjectively understood positive benefits of taking a health action to offset a perceived threat. This perception will be influenced not only by specific proximal factors, but an individual's overall 'health motivation'.

**Cues to action:** Reminders or prompts to take actions consistent with an intention, ranging from advertising to personal communications from Project Officers, health Professionals, family members and/or peers.

The model if properly applied in a systematic manner, would provide a relatively comprehensive understanding of the influence of social, economic and environmental factors on health behaviours. The application of the model should also focus largely on measurements and analyses of susceptibility, severity, benefits and barrier perception to adoption and use of improved fish smoking stoves.

#### ***3.1.3.4. Theory of Planned Behaviour Model***

The Theory of Reasoned Action, modified as Theory of Planned Behaviour (Ajzen, 1985), is a socio-cultural model for behaviour change. In this model, the primary determinant of behaviour is the individual's intention to perform it which depends on their attitude towards performing the behaviour and the individual's perception of the social (or normative) pressure exerted upon them to adopt or not to adopt the behaviour. (Figure 13).



**Figure 13: Theory of Planned Behavior**

### **Application of the theory of planned behaviour model**

The application of this model requires the understanding of the socio-cultural context in which the fish processors operate taking into cognisance the societal norms and cultural values. To be able to effectively apply this model, there should be a comprehensive study to understand the socio-cultural behaviours of the fish processors through a formative research. The results of the formative research can then be used in the application of this model.

This model specifically focuses on the socio-cultural behaviours of the fish processors in the adoption of any new desired behaviour such as ownership and use of improved fish smoking stoves.

The model hinges on the individual fish processor’s ability and intentions to change taking into cognisance their attitudes towards the change and the peer influence from the community, friends, relations and customers. SFMP partners working with this model would have to build capacities of the pressure groups at the community level to influence the desired behaviour towards adoption of improved fish smoking stoves. The external environment of the fish processor in relation to what others would say or react towards the adoption and use of improved cookstoves must be duly recognised. The acceptability of the improved fish smoking stove by the community in general is a good basis for the application of this model as well as societal influences.

The capabilities of the fish processors in relation to capacity, space and income should not be disregarded as that also contributes to the decision making point of adoption.

#### **3.1.3.5. Positive Deviance Model**

The positive deviance model is based on the observation that in every community there are certain individuals or groups whose uncommon behaviours and strategies enable them to find

better solutions to problems than their peers, while having access to the same resources and facing similar or worse challenges.

The positive deviance model is an asset-based, problem-solving, and community-driven approach that enables the community to discover these successful behaviours and strategies and develop a plan of action to promote their adoption by all concerned. The positive deviance approach hinges on the involvement of the community and beneficiaries whose way of doing things is in line with the desired behaviour.

### **Application of the Model in promoting improved fish smoking stoves**

Civil society organisations can also employ the positive deviance model to effectively desired behaviour change towards adoption of improved fish smoking stoves. With this model, the fishing communities will be involved in the promotion of improved fish smoking stove as the entire process will be driven by the community in developing action plan to reach scale with the desired behaviour. The CSO working with the communities would have to identify fish processors whose way of doing things conform to the desired behaviour. The selected fish processors are empowered to act as agents of change to drive the entire community change processes as positive deviants.

The model enables a community or organization to amplify uncommon behaviours or strategies discovered by community members among the least likely to succeed (positive deviants) or develop some activities or initiatives based on these findings and measure outcomes. The Development partner is expected to facilitate the entire process. The positive deviance approach brings about sustainable behavioural and social change by identifying solutions already existing in the system. It results in community mobilization and ownership, discovery of existing solutions, creation of new networks, and emergence of new solutions as a result of community initiatives.

The underlying assumption to harness the effective adoption of this model includes but is not limited to:

- Resources within the community is evenly distributed and accessible among the population
- The positive deviants are identified among those at the bottom of the pyramid and are recognised by their respective community
- That the product/service/intervention is affordable and provides wide options to all social groups
- Development partners play a facilitation role

## **3.2 Pricing Strategies in Upscaling Improved Cookstoves in Ghana**

One of the major barrier to adoption of improve stoves is cost. Price is a key determinant of demand and hence controls the purchasing capabilities of customers. Pricing is one of the four key elements of the marketing mix, along with product, place and promotion.

Instituting an appropriate pricing strategy is important for businesses that wish to achieve success by finding the price point where they can maximize sales and profits. To ensure effective upscale of improved stoves in Ghana, stove builders/enterprises that produces and sell improved fish smoking stoves as well as organisations that play intermediary roles in ensuring access to improved fish smoking stoves need to take into cognisance various pricing strategies to enhance market share.

The market forces of demand and supply ideally should be allowed to determine the price of an improved fish smoking stove. However, due to the disturbances within the market, this

cannot be achieved and hence the need for all relevant stakeholders to contribute to formulating appropriate pricing strategies. Over the period, energy enterprises and stove builders have not placed much importance on appropriate pricing strategies; this is because these enterprises have always galloped on the backs of development partners to sell their improved cookstoves in Ghana. This is often not sustainable and has contributed to challenges in upscaling improved cookstoves in Ghana. These enterprises need to operate as smart businesses and must capitalise on the basic principles of demand and supply to gain market share.

Averagely, the cost of constructing a chorkor smoke stove ranges between GHC100 to GHC 250 per unit. Due to its affordability and local context (the local artisans are able to build the stove using local materials), the processors have adapted to the chorkor stoves. Some of the processors are able to construct the chorkor stoves without support from the local artisans. For any business or enterprise to compete with this market, the alternative stove [improved] would have to be affordable to the processors.

Realistic price setting, still remain a major challenge to the businesses engaged in the supply and construction of the improved cookstoves in Ghana. Appropriate pricing strategies would harness efforts towards reaching scale. Some of the enterprises expect to make supernormal profits due to the presence of NGOs. The NGOs usually provide grants to subsidise the cost of the improved fish smoking stoves. Due to these subsidies, the businesses have not been able to set realistic market prices for the improved fish smoking stoves; the resultant effect being the price hikes. What is currently being practiced is skimming pricing and it involves setting a high price before other competitors come into the improved cookstoves market.

To reach scale, it is important to adopt two pricing strategies namely; the penetration and Bundle pricing strategies. Utilising these two pricing strategies would improve market share as well as reduce the barrier to adoption which often relates to the cost of the stove.

A penetration pricing strategy is designed purposely to capture market share by entering with a low price relative to the competition to attract buyers. With this strategy, the prices of the improved cookstoves are determined by what the business believes the end-users will be prepared/willing to pay. This is to help the business to raise the needed awareness and get end-users adopt and use the improved cookstoves. It hinges on the end-users ability to pay as a yardstick to setting the price.

The adoption of this pricing strategy by the stove builders/enterprises would be help to increase market share which will translate into wide spread adoption and use of improved fish smoking stoves in Ghana.

During field brainstorming session with the fish processors at the community level, their major concern with regards to adoption of improved cookstoves was the initial cost. The discussants were of the view that if the price differential between the unimproved and the improved cookstoves is not substantial then they would embrace the improved cookstoves.

To reach scale with improved cookstoves, it is necessary to penetrate the market with low pricing for the improved cookstoves by way of using local materials available within the community. This will encourage the end-users to switch from the traditional cookstoves to the improved cookstoves due to the low entry price.

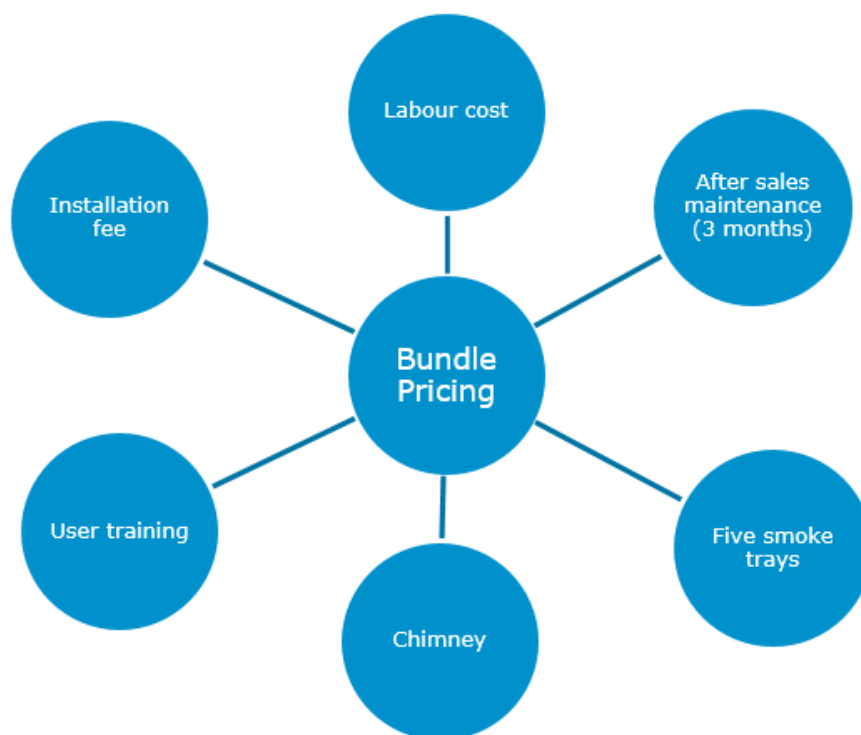
In the short term, penetration pricing is likely to result in lower profits for the enterprises than would be the case if price were set higher. However, there are some significant benefits to long-term profitability of having a higher market share.

In bundle pricing, the business entity sells a package or set of goods or services for a lower price than they would charge if the customer bought all of them separately. Pursuing a bundle pricing strategy allows the business entity to increase profit by giving end-users a discount. Bundle pricing is built on the idea of end-user surplus. Combining several products and offering the bundle at a reduced price would help penetrate the fish processing market with improved fish smoking stoves.

The bundle pricing strategy (Figure 14) has similar features of the penetration pricing, however its uniqueness resides with the package of products or services the end-user would benefit from. The stove builders and enterprises that supply improved cookstoves should adopt the bundle pricing as alternative pricing to the penetration pricing strategy.

The fish processors have a price they are willing to pay for the improved fish smoking stoves, provided the price differential between the traditional and the improved is not significant. If the price set by the enterprises is equal to or lower than what the end-user is willing to pay, the end-user will buy, as she/he considers the price a bargain.

During the small and focus group discussions with the fish processors, the discussants were of the view that penetration and bundle pricing strategies is ideal to capture market share. In discussing the bundle pricing strategy, the discussants were of the view that, the bundle pricing for the improved stoves should take into cognisance the following components; cost of raw materials, labour cost, installation fee, training fee, after sales service fee, processing trays and chimney.



**Figure 14: Bundle Price for Improved Cookstoves**

Based on the feedback from the fish processors, development partners, stove builders and enterprises should use the bundle pricing and factor the components articulated by the fish processors in making the improved cookstoves attractive.



### **3.3 Financing Strategy**

Financing strategy is a critical part of the business model (Shrimali G, Slaski X, Thurber MC, Zerriffi H. 2011). Unlike fully subsidized programs, a commercially viable venture selling to low-income populations must find a way to make its products financially accessible to its customers. “Consumer” finance – to help customers that might otherwise struggle to front the cash to purchase an improved fish smoking stoves – may be provided in many forms, including through commercial banks, the stove company itself, retail outlets, etc.

Financing could also play a major role by supporting local entrepreneurs who wish to become IFSS distributors. Such “enterprise” financing can help reduce the cost structure of the stove enterprise and enable it to generate positive returns at a lower price point for the stoves. End-User financing is critical for ensuring affordability in the acquisition of improved cookstoves and reducing the entry barrier of acquisition.

#### **3.3.1 End-User Financing Model Options**

An “end-user” is defined as any individual, household, business, or other consumer of an improved cookstoves or service. “End-user finance” is money borrowed by these consumers to pay for the improved cookstoves or services. Fish Processors in this case are referred to as the end-users of the improved fish smoking stoves. As compared to traditional fish smoke stoves, the improved fish smoking stoves are often viewed by the fish processors as more costly due to the high up-front payment that may be required by the stove builders.

Without end-user finance options available for the fish processors, it will be difficult for improved stove builders/enterprises to achieve significant scale in Ghana. The potential market for improved stoves can be transformed into actual customers if end-users can access finance for the purchase of the improved stoves and its related services. This has benefits for the end-users [Fish Processors], stove builders/enterprises, and Financial Institutions [lenders].

For example, buying and installing an improved fish smoking stove could cost approximately US\$400 (depending on the size), but will continue to provide high quality and healthy fish for many years without additional cost, apart from occasional maintenance of the stoves. On the other hand, traditional stoves though relatively cheap to acquire, has related cost such as; uses more fuel wood and produces lots of smoke which is harmful to the health of the Processors as well as reduces profit margins.

The benefit of end-user financing is enormous as the principles and dynamics that governs its application within any market ensures access and builds the purchasing power of the end-user (Table 4). There are multiple benefits from an effective end-user finance strategy and these are:

- By offering end-user finance, the stove builders/ enterprises will be able to expand the target market to include lower income fish processors that are able to pay for products over time but may not have the ability to make a lump sum cash payment.
- By working with an end-user finance partner, the stove builders/enterprise will be able to market products to fish processors that are receiving loan facilities from financial institutions.
- End-user finance partnerships contribute to increase promotion of the improved stoves.

**Table 4: Direct Benefits of End- User Financing**

<b>Benefits of End-User Financing</b>		
<b>Financial Institution</b>	<b>Stove Builder/Enterprise</b>	<b>End-User</b>
Financial Institutions can; <ul style="list-style-type: none"> <li>✚ Increase client retention,</li> <li>✚ Diversify product offerings,</li> <li>✚ Increase competitiveness and</li> <li>✚ Ultimately expand their client base while having increased social and environmental impact.</li> </ul>	End-user finance can; <ul style="list-style-type: none"> <li>✚ Increase sales and revenue,</li> <li>✚ Improve technology and design,</li> <li>✚ Increase market share,</li> <li>✚ Reach clients with lower incomes or irregular income streams.</li> </ul>	Fish Processors, Households and small business have the ability to purchase improved stoves and services that can; <ul style="list-style-type: none"> <li>✚ Bring well-being and health benefits,</li> <li>✚ Increase economic productivity,</li> <li>✚ Reduce energy expenditures, and</li> <li>✚ Improve livelihoods.</li> </ul>

**3.3.2 End-User Finance Business Models**

To reach scale with adoption of improved fish smoking stoves in Ghana, it is important to develop strategic financing models to assist the end-users to make purchases.

Four different models have been developed based on lessons from Ghana and other countries, taking into account the financial system in the country. These are; dealer financing model, umbrella financing model, brokering financing model and inclusive financing model.

The end-user financing models developed are sustainable models which can be adopted by government, development partners, stove builders/enterprises and financial institutions in upscaling improved fish smoking stoves.

End-User financing models cannot be implemented in a vacuum. It requires some level of financial intermediation between the demand and supply chains of improved cookstoves.

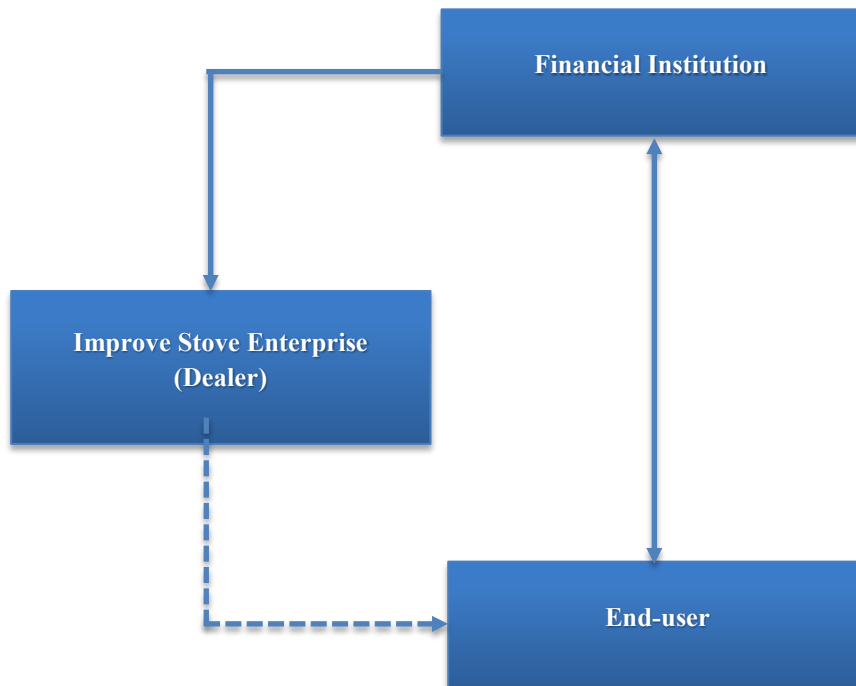
**Dealer Financing Model.**

Dealer financing is a form of financing where a service is directly provided to a customer by a service delivery enterprise and payment made under a credit agreement by a financial institution after certification and client satisfaction. (Figure 15)

Dealer financing is one of the result based financing models which ensures that client satisfaction and expectation are met before payments are effected to the service delivery organisation. This model typically involves a financial institution providing credit to an end-user and managing the monitoring and repayment processes, while the energy company provides the energy product, installation (if necessary), service and maintenance.

The dealer financing model provides a direct relationship between the financial Institution, end-user and the supplier of the improved stoves referred to as Dealer. The Financial Institution go into a special arrangement and contract with the dealer in marketing the dealer’s product to its clients and then provides credit lines for the clients to purchase the improved stoves from the dealer through the financial Institution.

It also seeks to limit cash transfer from a financial institution to a client and therefore reduces the risk of cash diversion. It reduces the risk of non-payment of services provided by the enterprise since the payment is done by the financial institutions on behalf of the end-users.



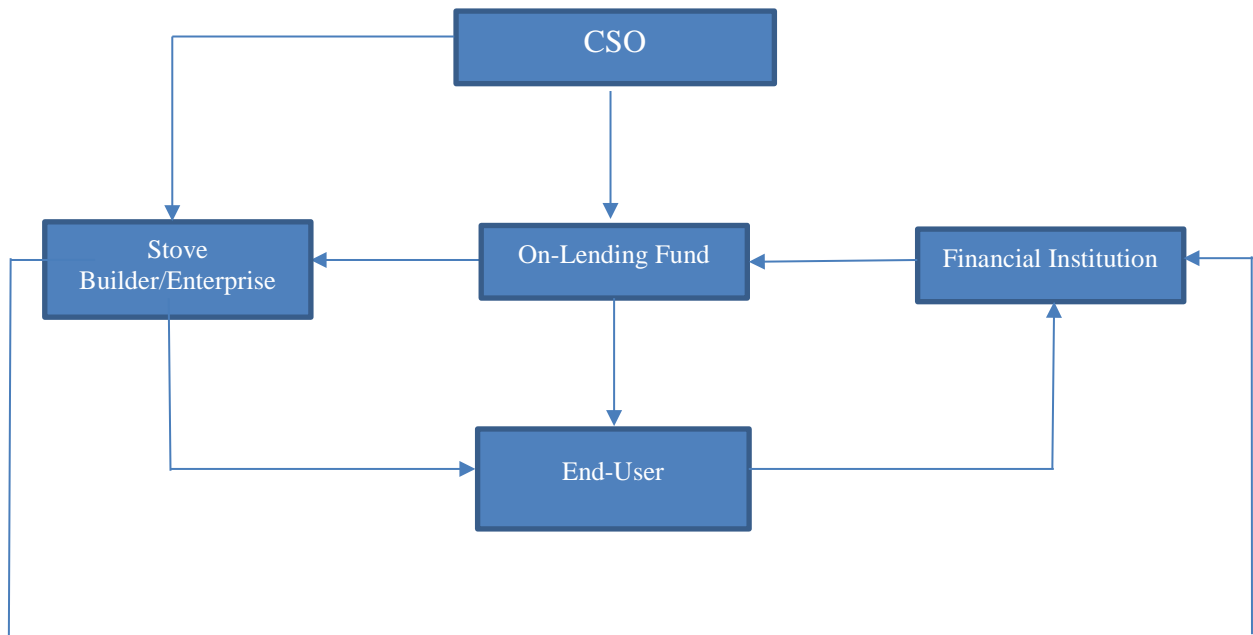
**Figure 15: Dealer Financing Model**

It encourages competition and quality since a pull of service delivery enterprises providing similar products/services as well as specification, are introduced to the end-user for their independent decision and selection. With this model, the promotion of the product is borne by the financial institution and the dealer and this harnesses inclusive finance.

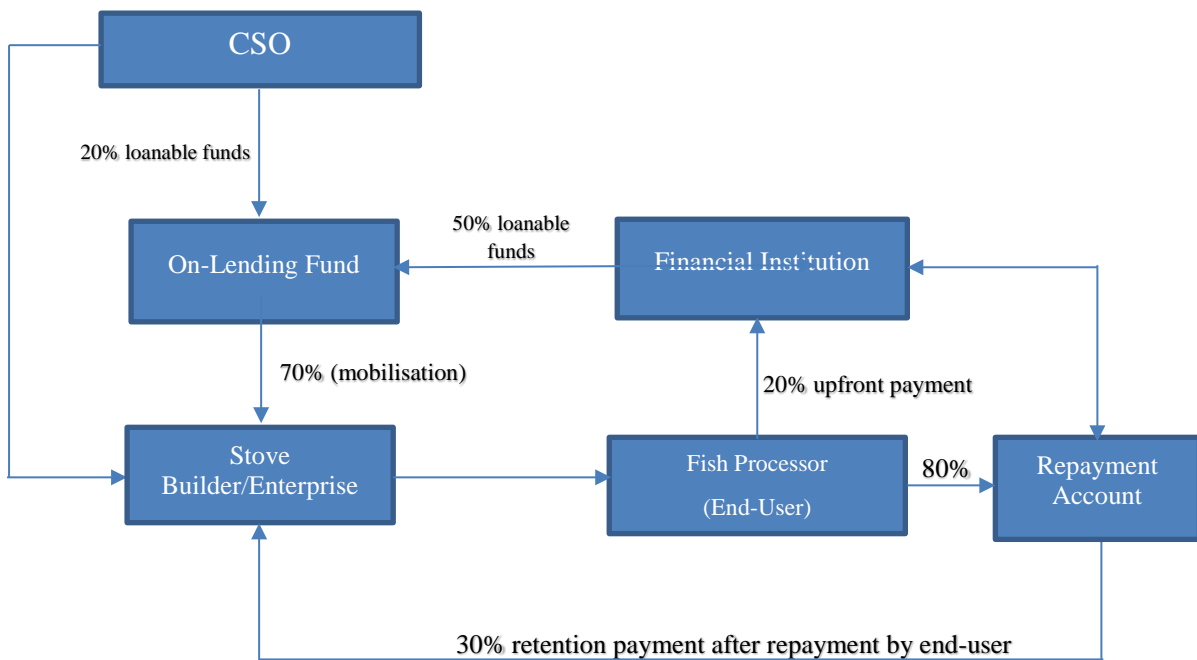
The only relationship that exists between the end-user and the dealer (stove builder) is that of user training on the stove built and other services relating to after sales support [maintenance]. This end-user financing model requires a sound and strong financial institution with dedicated portfolio for asset financing, has touch with the end-users as well as have attractive financial products. For such a financial Institution, its capital adequacy should be at least 10 percent and regulated. This model places the financial institution at the centre of the business as the financial institution serves as the bridge to reduce the gap and create effective linkages between the demand and supply chains of improved stoves.

The key pricing strategy recommended for this model is the bundle pricing. The bundle pricing allows the financial institution to provide and build its pricing in a holistic manner taking into cognisance the following components; stove price, installation fee, training fee, maintenance guarantee fee, after sales services (replacement of parts) and insurance. With this pricing option, the Financial Institution is allowed to price the improved cookstoves based on the components as one off fee.

Figure 16: shows a dealer Financing Model when a subsidy is provided by a CSO. Figure 17 illustrates a Comprehensive Dealer Financing Model when a subsidy is provided by a CSO. Table 5 sets out the roles and responsibilities of stakeholders involved in dealer financing model.



**Figure 16: A dealer Financing Model When Subsidy is provided by a CSO**



**Figure 17: A Comprehensive Dealer Financing Model When Subsidy is Provided by a CSO**

**Table 5: Roles and Responsibilities of Stakeholders involved in dealer financing model**

CSO Responsibilities	Financial Institution Responsibilities
<ul style="list-style-type: none"> <li>-Contributes 20% of the total fund value to the On-lending Fund</li> <li>-Provide technical assistance to Financial Institution on financial product development</li> <li>-Facilitate the certification of the improved cookstoves</li> <li>-Ensure stove builder builds to specification and standards</li> <li>-Provide capacity building to End-Users (Fish Processors) on small business management.</li> </ul>	<ul style="list-style-type: none"> <li>-Fund Manager and Custodian to the on-lending fund</li> <li>-Manages the loan repayment accounts</li> <li>-Contributes 50% of the total funds to the on-lending funds</li> <li>-Sign direct contract with the Stove Builder/Enterprise</li> <li>-Opens an account for the Stove Builder/Enterprise</li> <li>-Advance 70% of the total cost of the improved stove to the Stove Builder/Enterprise</li> <li>-Retain 30% of the cost of the improved cookstoves on behalf of the stove builder/Enterprise.</li> <li>-Sign loan agreement with the end-user</li> <li>-Collect repayment of loan granted to end-user</li> </ul>
Stove Builder/Enterprise	Fish Processor (End-User)
<ul style="list-style-type: none"> <li>-Open and maintain accounts with the Financial Institution.</li> <li>-Build stove to standard specifications</li> <li>-Train end-users on stove maintenance, heating, use and safety</li> <li>-Ensure quality materials are used in building stoves</li> </ul>	<ul style="list-style-type: none"> <li>-Open and maintain accounts with the Financial Institution</li> <li>-Deposit 20% of the total loan amount as cash collateral (upfront payment).</li> <li>-Make weekly/daily/monthly loan repayment.</li> <li>-Build and maintain sound relationship with the Financial Institution.</li> </ul>

Table 6 shows the product dynamics of a subsidized dealer financing model.

**Table 6: A Product Dynamics of a subsidized dealer financing model**

1	Characteristics Type of ownership Age of business	<ul style="list-style-type: none"> <li>• Must be a Fish Processor</li> <li>• At least 6 months of industry experience</li> <li>• History with financial Institution (an added Advantage)</li> <li>• Registered/identified with Agro Processor groups</li> <li>• Not less than 18 years of age</li> </ul>
2	Ability	<ul style="list-style-type: none"> <li>• Fair understanding and experience in Fish Processing activities.</li> <li>• Consistent average daily/weekly/monthly sales</li> <li>• Existing Client of Financial Institution (an added Advantage)</li> </ul>
3	Means Technical, Managerial & Financial capacity to operate successfully	<ul style="list-style-type: none"> <li>• Market knowledge</li> <li>• Availability of technical expertise for existing going concern</li> <li>• Consistent profit generating ability</li> <li>• Adequacy in operating profit margin</li> <li>• Does not process for household consumption</li> </ul>
4	Purpose Existence of need	<ul style="list-style-type: none"> <li>• Agro processing activities resulting in positive health and environmental impact specifically targeting Fish Processors to own and use improved fish smoking stoves</li> <li>• For rural and Peri-Urban Fish Processors to own and use improved fish smoking stoves</li> </ul>
5	Product Cost (Stoves)	Single improved fish smoking stove Double improved fish smoking stove Triple improved fish smoking stove
6	Loan Size	Minimum loan amount Maximum loan amount
7	Loan Tenure	Maximum: 12 months Minimum: 3 months
8	Interest Rate	Xx percent per month (Reducing balance/Flat)
9	Arrangement Fees	Processing Fee: Insurance Fee:
10	Loan Security	Solidarity Guarantee 20% Cash Collateral paid into savings Account with Financial Institution
11	Repayment frequency	Daily/Weekly/Monthly
12	Other conditions	<ul style="list-style-type: none"> <li>• As per credit approval</li> <li>• Moratorium on interest calculation up to a period of 4 weeks.</li> </ul>

### **Advantages of dealer financing model**

- Helps to prevent diversion of funds
- To ensure quality and durable service as payment is subject to client certification
- It provides wide variety of choice for clients from several available service delivery organisations
- The dealer is certain about the demand created and prepares appropriately to meet the demand
- It encourages prompt payment to the dealer enterprise
- It provides a business opportunity for the financial institution as it intermediates between the demand and supply sides
- It enhances market linkages between the demand and supply chains
- It is a simple model to implement as the players are not many.

### **Disadvantages of dealer financing model**

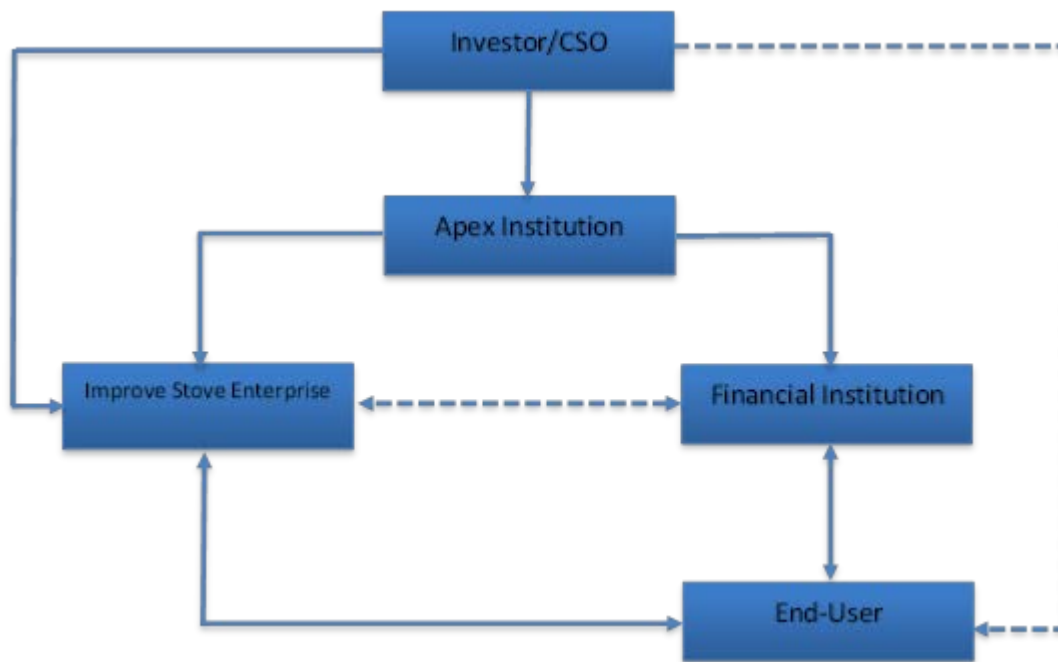
- The risk of the dealer enterprise losing the capital invested in the service is high if a client changes his/her taste after the constructions
- Only very well established resource service delivery organisations can only participate in this type of model since it requires pre-financing of such services

### **Umbrella financing Model**

The umbrella financing model creates an atmosphere of entrepreneurial mind set on the part of the stove builder/enterprise to directly interact with the apex of financial institutions. The improved cookstoves enterprise/builder enters into a direct partnership arrangement with an “Apex Institution” that manages a network of local financial institutions (e.g. a union or organisation of credit cooperatives, credit unions, or other village-based financial institutions).

The Apex Institution then sources for on-lending funds from donors, private investors and impact investors, in establishing a wholesale on-lending fund for its member financial institutions to access. The apex institution lends money to the financial institution for subsequent on-lending to the end-users, and manages the monitoring and repayment processes. The improved cookstoves enterprise provides the improved cookstoves to the end-users.

The umbrella financing models (Figure 18) also provide opportunity for the improved stove enterprise and the end-users to both operate accounts with the financial institution in ensuring inclusive finance for the unbanked end-user populations. This model allows the donor or impact investor to also invest into the improved stove enterprise in the form of technology development and advancement as well as improvements that would positively impact the health and business of the end-user. The impact investor/donor can also provide business capacity development and awareness creation for the end-users by way of activating demand and strengthening the supply chains to serve the demands created.



**Figure 18 Umbrella Financing Model**

### **Advantages of umbrella financing model**

- The on-lending funds to the financial institution would help grow the loan portfolio
- The actors within the umbrella model have opportunity to benefit from capacity development support from the investors/donors.
- The improved stove enterprise is able to reach many more end-users
- Promotes relationship between the end-users, improved stove enterprise and the end-users.
- The Financial Institution and the Improved Stove Enterprise stick to the business area that they know best.

### **Disadvantages of umbrella financing model**

- Possible delays in the release of funds from the Apex Institution to its members.
- It is more difficult to manage the partnership and relationship among the actors.
- It is also challenging in ensuring that all activities are being implemented effectively across the network.
- It is a very complex model to implement

### **Brokering Financing Model**

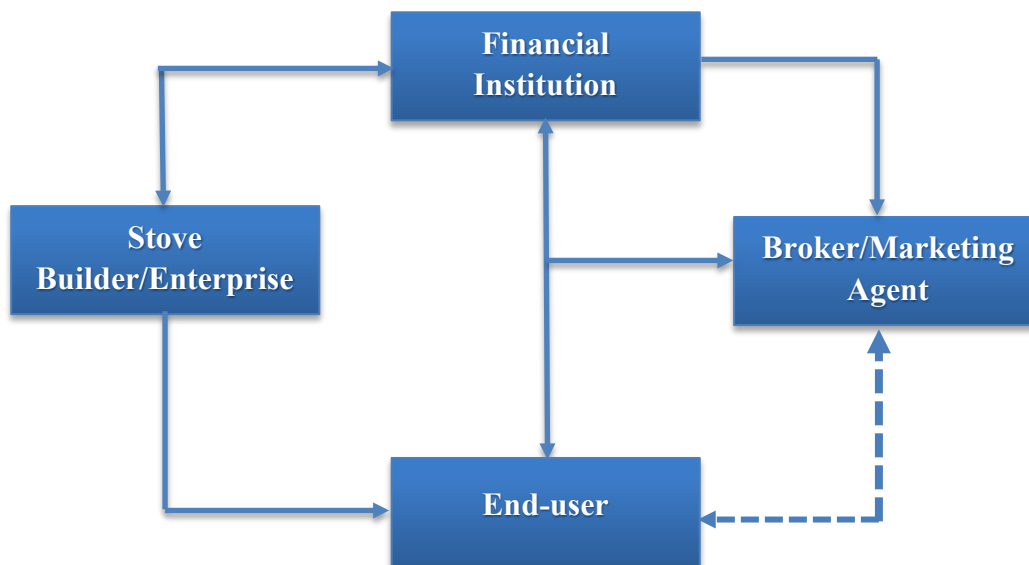
The brokering financing model (Figure 19) is another form of end-user financing where a third-party organisation or individual is paid by the Financial Institution and the stove builder/enterprise to act as its marketing agent/representative to market the improved cookstoves to the fish processors/end-users and assess customers' suitability for financing.

The marketing agent's responsibility is to identify potential clients who will be interested in the improved cookstoves and are willing to pay and then refer them directly to the Financial Institution to access credit to buy the improved cookstoves.

With this financing model, the financial institution and the stove builder may also involve the broker in the loan payment collection, after-sales service, and technical upkeep. The broker



can be a local artisan within the community or any community representative trained to market the improved cookstoves as a broker. This model works effectively when the financial institution is willing to provide credit to the viable customers to make purchase.



**Figure 19: Brokering Financing Model**

The model allows direct contact with the broker and the financial institution as well as the stove builder/enterprise. With this model, the broker can directly access credit from the financial institutions to provide the improved cookstoves to the viable customers and then recover his monies with a margin. In this situation, the customers do not have to access credit facilities from the financial institutions to purchase the stove. The model works perfectly on basis of mutual trust and consent by all the parties involved. That is the financial institution, stove builder/enterprise and the marketing agent/broker.

With this model, the cost of marketing and promotion is borne by the broker. The broker is only paid on commission basis by the financial institution. The model also creates an opportunity for the stove builder to fully benefit from sales without direct financing because the financial institution will pre-finance the construction of the stoves on behalf of the end-users and effect payment directly to the stove builder/enterprise.

#### **Advantages of Brokering Financing Model**

- A simple way of increasing reach and expanding the market, and brokers are usually paid a finder's fee after the product is sold, so it doesn't require upfront cash investment.
- It promotes sound business relationship between financial institutions and the brokers.
- It reduces the marketing cost burden of the stove builder/enterprise and the MFI.

#### **Disadvantage of brokering financing model**

- It relies on brokers who can effectively market products and screen customers. So when the broker is ineffective, it affects the entire financing. The financial institutions can also not completely rely on the recommendations by the broker especially in a situation earlier recommendations by the broker resulted in non-repayment.

- The model does not work/function properly in a situation where the broker is not well motivated.

### **The Inclusive Financing Model**

The inclusive financing model (Figure 20) provides a holistic model for financing end-users and businesses within the improved cookstoves market. The model combines financing with capacity development support to the businesses within the improved stove market that would access credit from the Bank or Microfinance institutions.

The donor or investors are expected to provide funds or grants for on-lending to the businesses and the end-users to finance the purchase of improved cookstoves. The funds from the donors or investors are expected to function as a revolving fund release to the targeted beneficiaries through a CSO.

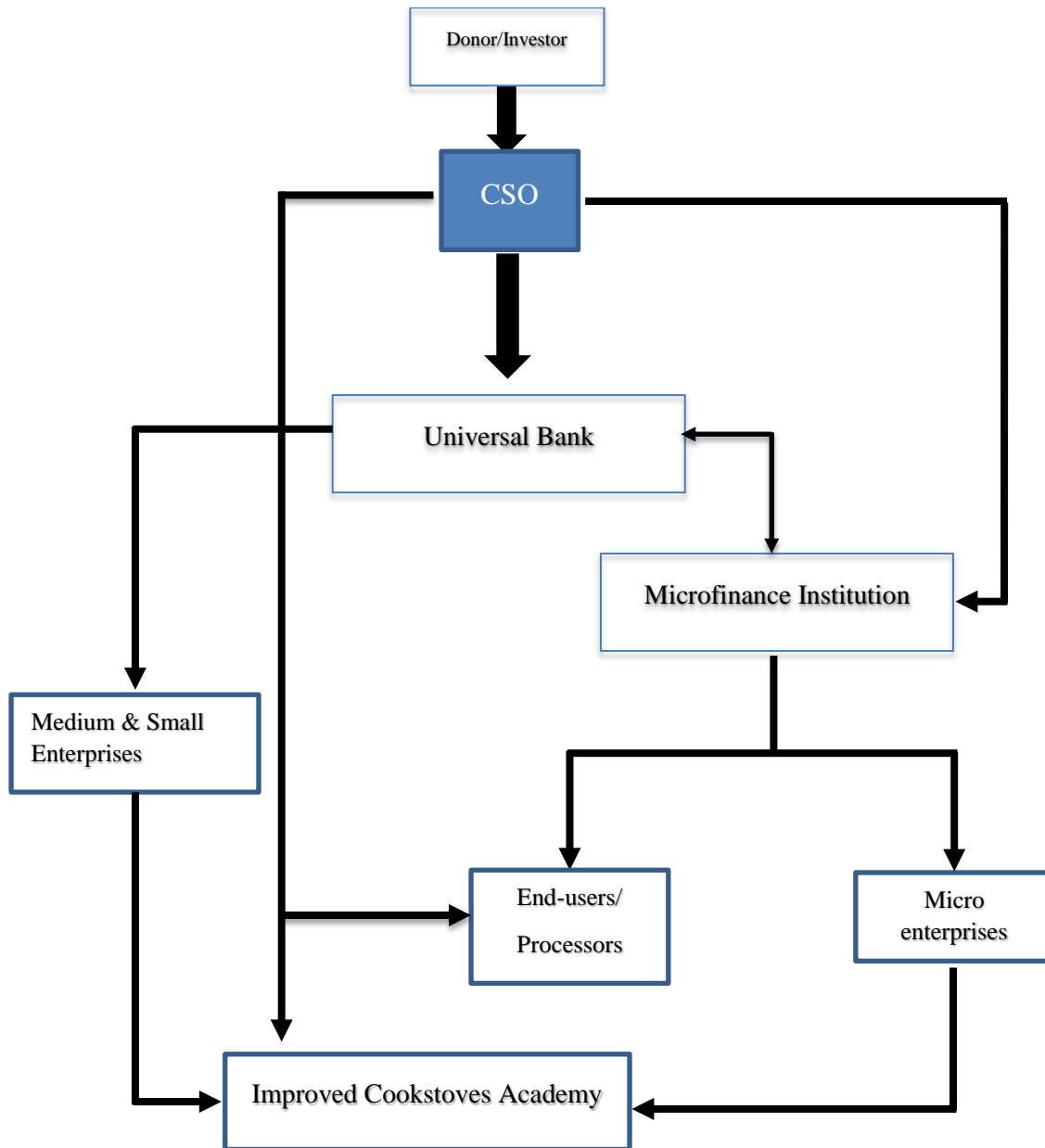
The role of the CSO within the model is to develop strategy for the management of the on-lending funds and provide technical support to the financial institutions in the development of financial products on improved cookstoves. The CSOs will act as fund managers of the revolving fund received from the donor or investor. The CSO will additionally manage the improved cookstoves academy by developing curriculum for running the academy as well as facilitation.

The Bank in the model represents universal banks licensed by the Bank of Ghana that has the capacity to undertake on-shore and off-shore financial transactions. The role of the universal banks is to act as custodians to the on-lending funds on behalf of SNV or CSO. The universal bank is also expected to on-lend to the SMEs within the improved cookstoves market.

The Microfinance Institution identified in the model includes all the Tier 1, 2 & 3 microfinance finance institutions licensed by the Bank of Ghana. This includes; Rural and Community Banks, Savings and Loans Companies, Microfinance Companies and Financial NGOs. The role of the MFI will be to on-lend directly to the end-users and micro businesses and also act as fund managers

The improved cookstoves academy is expected to provide capacity building to the businesses/stove builders on both technical and business management training which will form part of the requirement for accessing the loans from either the bank or the microfinance institutions.

Figure 20: The Inclusive Financing Model



### 3.3.3 Key Legal Issues to be considered in Implementing End-User Financial Models

End-User financing models can have challenges if due processes are not followed by the implementing institutions in Ghana. In Ghana, the financial industry is regulated by the Bank of Ghana and the Security and Exchange Commission. These regulatory institutions provide operational guidelines and benchmarks to the financial institutions in Ghana. Microfinance Institutions such as Rural and Community Banks, Microfinance Companies, Credit Unions, and Savings and Loans Companies are also regulated through prudential regulation. End-User financing models cannot be implemented in a vacuum. It requires some level of financial intermediation between the demand and supply chains of improved cookstoves.

The key legal and policy considerations include:

**Financial sector regulation:** The regulation and supervision of financing activities is one of the most important issues to consider when planning end-user finance options. If the CSO chooses to offer finance in-house without a partner, then the CSO would need to fully

understand the regulatory framework to operate within to legally offer end-user finance options. In Ghana, the Bank of Ghana also regulates NGOs providing microfinance services. On the other hand, if the CSO partners with a Financial Institution then it is important for the CSO to understand the regulatory implications and framework for financing activities.

**Interest rate policies:** In Ghana there are no restrictions on interest rates. Ghana practices open market operations in terms pricing of financial products. However, to ensure regulatory compliance, the Bank of Ghana from time to time comes out with a policy rate to guide financial institutions in the determination of interest rates for their financial products.

A sustainable end-user financing model would have to ensure that the interest rates are within the market rate. To ensure financial sustainability, end-user financing needs to be priced to allow for recovery of all associated costs, and any profits, regardless of whether offered in-house by the CSO or through a finance partner.

Interest rate subsidy at times creates market distortions and is usually unsustainable especially after the end of the project.

**Legal enforcement of contracts:** The Financial Institution, CSO and improved cookstoves enterprises need to understand the legal framework for effective enforcement of financial contracts. It is useful to examine contract law and property rights in Ghana and regulations that can impact the ability to introduce penalties for end-users (i.e. late fees) in case of late payment or default.

**Ability to seize pledged assets:** Some Financial Institutions and improved cookstoves enterprises may require that interested clients offer assets (cash or other equipment used for fish smoke processing) as collateral for end-user finance products. End-user who may not have collateral may be allowed to save with the financial Institution over a period of time and then convert the savings into cash collateral. In these cases, it is important to understand the legal requirements and processes involved in seizing pledged assets. The lenders and borrowers act provide explicit information on collateral requirements and management.

### **3.4 Marketing Strategies**

Despite the various marketing approaches used by stove builder/enterprises, development partners and CSOs, these approaches have not yielded expected results. Thus, there is a critical need for innovative and comprehensive marketing strategies to complement the promotional strategies in marketing the improved cookstoves to the end-users. Appropriate marketing strategies are needed to influence the performance of a commercial stove-selling venture.

To reach scale with adoption of improved fish smoking stoves, development partners and the private sector need innovative ways to market the products to the end-users and this can only be effective through the adoption of social marketing strategy. Studies of both commercial and non-commercial distribution of health-improving products have emphasized the importance of “social marketing”.

Social marketing is generally used to create awareness of the product and its benefits; an understanding of the benefits is actually of most value to the end-users and should drive the stove design.

#### **Social Marketing Strategy**

Social marketing is a process for creating, communicating, and delivering benefits that a target population desires in exchange for adopting a behaviour that profits society. It gained recognition as a professional discipline in the 1970s, when marketing practitioners began to

apply commercial marketing techniques to change behaviours to improve health and protect the environment. Over the past decades, the field of social marketing has made significant strides and is now widely acknowledged and applied in the development field specifically in the areas of adoption of technology in promoting ideal and desired behaviours.

The essence of adopting the social marketing strategy is to strengthen the supply side (Stove Builders) and other renewable energy enterprises concerned with the sale and marketing of the improved cookstoves.

In any social marketing intervention, a specific behaviour is targeted for modification or adoption for the benefit of society as a whole and in this case, the Fish Smoke Processing Groups in Ghana. To improve the upscale and adoption of improved fish smoking stoves the four Ps in marketing mix would have to be applied in social marketing. The Four Ps are core to any social marketing initiative. (Figure 21).



**Figure 21: The 4Ps in Marketing Mix**

### **Product**

The key principle of social marketing of improved cookstoves should be demand-responsive. The improved cookstoves currently on the market such as Frismo stove, FTT Stove, Morrison stove and other open source must be user friendly and should offer the utmost benefits to the end-users within the framework of the SETH model.

Stove builders/businesses must think of providing user friendly and less costly technology options for the end-users. Conventional wisdom in development has been that the more product options available, the better for the end-user.

## Factors to consider in Technology Design

**-Standardisation:** This involves providing standard technical specification in the design of the improved fish smoking stoves which conforms to approved standards by regulatory authorities and has lower PAH [Polycyclic Aromatic Hydrocarbons].

**-Contextualising the Product Technology:** Localising the production of the improved stoves would facilitate adoption of the technology by the end-users. Product ownership is key to successful adoption of improved fish smoking stoves.

**-Product options:** Provision of a range of improved fish smoking stove options will enable the end-users to make informed decision with regards to the choice of stove.

**-Product Technology:** Provision of an open source technology will foster adoption as issues of patent will not be a hindrance to institutionalising local capacity in construction of the stoves. The chorkor stove for instance is wide spread because local knowledge on its construction is present in most communities. The technology design should take into cognisance its user friendliness and should not significantly deviate from the old technology the beneficiaries are used to.

**-Improving existing technology:** Efforts should be put into improving the chorkor stove to meet the standard specifications as an improved cookstoves. Majority of the fish processors for instance are used to the chorkor stove because it is contextualised and also affordable. The raw materials used for construction of the chorkor stove are all local materials which are usually available in most communities. Construction of the chorkor stove is usually undertaken by the local artisans and not by an external person. Decentralising the improved cookstoves technology is necessary to enhance adoption by the fish processors.

**- Modularization of the Product:** Modularization of the product [improved fish smoking stoves] involves standardizing the product in a way that allows for upgrading over time, as needs and budget evolve within the business and upon request by end-users and other stakeholders. The modularization must follow the benefits ladder to the End-User. Modularization should also follow cultural patterns of the end-user communities.

### Product Design Parameters

The key factors to consider in designing an improved fish smoking stove should mainly take into cognisance the following;

- ❖ Cost of the stove to the end-user.
- ❖ Production capacity of the stove in terms of processing rate and volume it can take during processing.
- ❖ Contextualised solution having resemblance of the existing stove technology the beneficiaries are used to.
- ❖ End user knowledge of the technology.
- ❖ Operating cost of the stove relating to efficiency of the stove in fuel consumption.
- ❖ Quality as well as durability of the stove.
- ❖ Availability of local technical support [After sales service and maintenance].
- ❖ Lower PAH and reduction in how much pollution is emitted to the environment by the stove.

## **Place**

Place is a very important component of social marketing as it enhances access to the improved fish smoking stoves. The improved fish smoking stoves must be positioned at a strategic location/place that is accessible to potential end-users. Availability and visibility of distribution outlets to the end-users will improve adoption and use. The chorkor stove has distribution outlets within the community through the local artisans who usually reside in the community. Similar arrangement should be made in ensuring that local capacity is built at the community level.

This can be achieved through the establishment of an S-Mart to make the stoves accessible and also promote the various types of improved cookstoves to the targeted end-users.

The S-Mart concept is adapted from the SaniMart concept used in social marketing of sanitation.

### ***Establishment of S-Marts***

*S-Mart is a mini market for improved stoves. The establishment of Improved Stove mini marts (S-Marts) at district and regional markets where majority of the fish processors and other Agro processors sell their processed products will enhance adoption and use. The improved cookstoves mini marts must be stocked with proto types of all improved cookstoves designs with their relative cost. A major determinant of demand is taste and preference; so it is important to provide the fish processors with range of options at the S-marts to enable them make informed decisions with regards to the choice of stove they would prefer. Similar improve cookstoves mini marts can be established at community levels where the use of traditional cookstoves is predominant.*

The establishment of S-Marts at the community and district levels would improve access to improved stoves. To scale with improved fish smoking stoves, it will be necessary for governments and development partners to focus resources towards the establishment of S-Marts in fishing communities and in major fish markets.

### ***Promotion***

Promotion is a very important component of social marketing as it can boost the sales and adoption of improved fish smoking stoves. Promotion should comprise of elements such as; sales promotion, public relations, sales organisation and advertising. Promotion can be done through various mediums such as word of mouth and advertising on radio stations and community public address system. For social marketing to work effectively, promotion must not be compromised. All promotional activities should be undertaken using the SETH model and BCC approaches.

In creating an effective promotional strategy, the following would have to be considered:

- How marketing messages can reach the potential end-users;
- The appropriate time to promote the improved fish smoking stove to the fish processors;
- What medium of communication will reach the intended or targeted end-users;
- What appropriate social media can be used to promote the improved fish smoking stove;

The combination of promotional strategies outlined above will improve adoption and use of improved fish smoking stoves in Ghana. Development of IEC materials must be consistent

with local context to create a better understanding for the end-users and targeted beneficiaries.

### **Price**

Social marketing places premium also on price of the product as that is a major determining factor to adoption of improved fish smoking stove. It may seem obvious, but companies attempting to penetrate the bottom of the pyramid market must go to extremes to strip out costs and make product prices as low as possible. Design innovation, supply chain efficiencies, and distribution are all areas for cost reduction that should be critically examined.



## **4.0 CONCLUSION AND RECOMMENDATIONS FOR BUILDING DEMAND FOR IMPROVED FISH SMOKING STOVES IN GHANA**

### **Conclusion**

Ghana is a middle lower income country imbued with natural resources and has an estimated population of 25 million. The main economic activity along the coastal belt of Ghana is fishing. Fish processing is also the major economic activity of the women in these fishing communities in Ghana. Majority of the women engaged in fish processing are fish smokers whereas others are also engaged in fish salting, frying and drying.

To improve on the quality of fish processed by these women engaged in fish smoking, there must be a paradigm shift from the use of traditional fish smoke stoves to improved fish smoking stoves in Ghana. The only way to guarantee a healthy fish market is to encourage the adoption of improved fish smoking stoves among the fish smoke processing women in Ghana.

Presently adoption and use of traditional fish smoke stoves is widely spread along the coastal belt of Ghana. Majority of the women use the chorkor fish smoke stove and other traditional stoves such as the round metal stoves and mud stoves. The most basic requirement for improved fish smoking stove adoption is acquisition and also requires that the fish processors have the decision-making power and the economic resources to make the purchase.

### **Recommendations**

The objective of healthy fish market can only be achieved if improved fish smoking stoves are used by the processors engaged in fish smoking. The use of an improved fish smoking stove would improve the quality of the smoked fish and reduce the PAH levels which is usually harmful for human consumption if it is on a high side. To reach scale with the adoption of improved fish smoking stoves in Ghana, the following are recommended:

#### **Application of right business model**

To reach scale with adoption of improved fish smoking stoves in Ghana, it is necessary to espouse a sustainable business model that triggers and sustains the adoption and use of improved fish smoking stoves. The diamond business model is recommended as a holistic model for the upscale of improved fish smoking stoves in Ghana. The diamond model creates an ecosystem where the demand and supply chains effectively interact to improve the market linkages through financial institutions and government. The model recognises the unique contribution of all relevant stakeholders in linking demand created to supply chains. The model if adopted, will foster effective relationships between all the actors and relevant stakeholders engaged in the upscale of improved fish smoking stoves in Ghana.

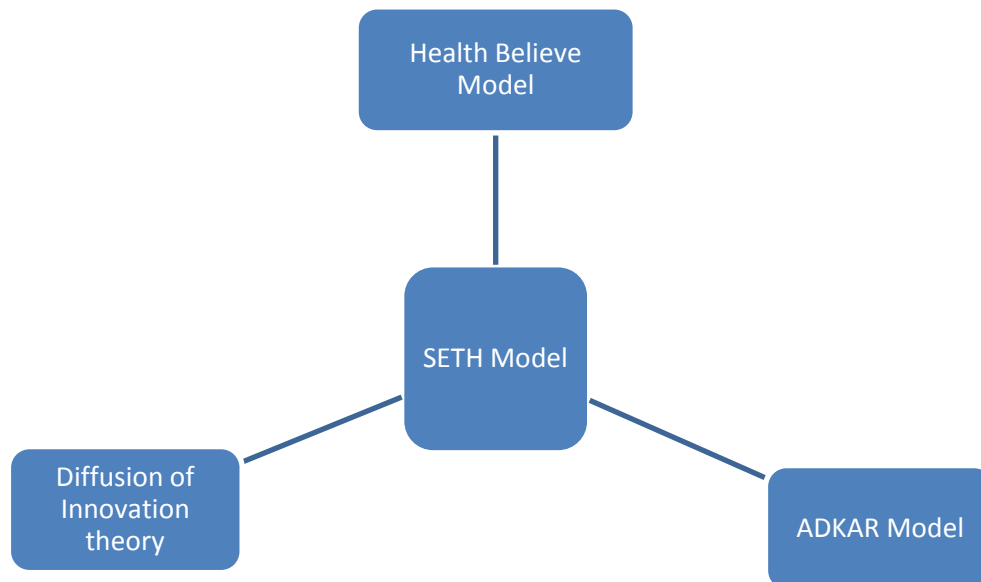
#### **Appropriate and Effective Financing Options**

The provision of appropriate and effective financing options for both the end-users and the enterprise that builds or supplies improved fish smoking stoves is necessary to reach scale. Implementing appropriate financing options for the end-users and stove builders/suppliers will link demand to supply of improved fish smoking stoves in Ghana. To reach scale, the dealer financing and inclusive financing models are recommended. The two models provide a holistic and sustainable approach to financing the acquisition of improved fish smoking stoves.

#### **Effective Promotion of Improved fish smoking stoves**

To reach scale with adoption of improved fish smoking stoves in Ghana, promotion must be stepped up using behaviour change communication strategies and models. For effective and

efficient promotion of improved stoves, combination of the ADKAR model, health belief model and Diffusion of innovation theory must be used (Figure 22), with the SETH Model serving as pivot around which these combined models are used. No one single model will be adequate to reach scale with adoption.



**Figure 22: Effective Promotion of Improved Fish Smoking Stoves**

### **Effective Marketing of Improved fish smoking stoves**

Marketing plays a major role in demand creation and in the accumulation of goods in almost every society. Generally, effective marketing requires a creative strategy that is built around insights about the fish processors. To reach scale, the social marketing approach is recommended as it hinges on the 4Ps namely; product, place, people and price.

Improved fish smoking stove promoters especially CSOs and improved stove enterprises should be confident in marketing the product based on what the consumer has identified as the most important attribute. SFMP and its implementing partners must intensify promotion and marketing campaigns based on the experiences of the processors that used the piloted improved fish smoking stoves in selected communities through video shows, word of mouth and through community-based radio discussions.

### **Effective End-User Engagement**

To ensure adoption of improved fish smoking stoves, targeted end-users must be engaged in the design of the stoves and be allowed to make input based on their experiences with the traditional stoves. Government, CSOs and enterprises need to engage with users directly by way of product demonstrations as is the most effective driver of stove adoption. The demonstrations will help address end-users perceptions and issues relating to improved fish smoking stoves. In a study of 10 stove manufacturers in India, all 10 companies identified product demonstrations as the most effective driver of stove adoption (Shrimali, Slaski, Thurber, & Zerriffi, 2011) . Improved stove manufacturers in Ghana can learn from the Indian experience to reach scale.

The engagement with the end-users should not end at the point of sale; this is because with any new technology, there is a user learning curve. Government and Civil Society Organisations must on a continuous basis organise end-user learning curve workshops and seminars targeting the fish processors and off-takers [fish traders]. In addition to training at the point-of-sale using formal and informal input, end-users should receive regular follow-up visits until they have mastered the technology. These visits are critical to fostering correct and sustained use of the new stove.

### **Engaging Women across the Value Chain**

Women constitute majority of the workforce engaged in fish smoking in Ghana and therefore can be potential main target beneficiaries for adoption of improved stoves. The key actors within fish smoke value chain are mostly women and are central to improving healthy fish market.

Women are generally perceived to have greater control over the use of household income and expenditures which tend to be more focused on meeting the basic needs of the family and of the children. (Abu-Ghaida and Klasen, 2004). Involving and engaging women in all aspects of improved fish smoke stove design, promotion and marketing would yield positive benefits for themselves and their families.

Women are one of the fastest growing cohorts of entrepreneurs in many developing countries and leveraging their strengths offer an opportunity for the energy sector.(Brush, C., 2006). Women's substantial informal networks can open doors for adoption of improved fish smoking stoves and provide access to target consumers in hard-to-reach markets. Networks such as CEWEFIA, DAA, DAASGIFT and NAFPTA would help in promoting the adoption and use of improved cookstoves.

Women are uniquely positioned to promote adoption and use of improved fishing smoke stoves in Ghana. As the primary end-users and beneficiaries of improved fish smoking stoves, the women fish processors are well-versed in understanding the challenges of improved fish smoke stove adoption and continued use, and are therefore integral to any awareness and educational campaigns. The women can also play central roles in supporting maintenance as leaders, networkers, and promoters for improved fish smoking stoves in their communities.

To reach scale, it is necessary to effectively engage women in ways that accommodate or help overcome existing constraints while building intrinsic and extrinsic supports for their successful involvement.

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