

Climate-friendly cooking: scaling markets A Guide on the Professionalisation Approach

Caleb Ochere, an ICS producer at Lakenet Energy Solutions in Kisumu, Kenya is showcasing a portable ICS stove that he produced during a stove fabrication training.

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Preface

Latest SDG 7 tracking confirmed the persisting gap to reach universal access to clean cooking. Unless rapid and decisive action is taken, 1.9 billion people will lack access to clean cooking fuels and technologies by 2030. Recent calls for action also highlight the strong contribution of clean cooking to other SDGs such as improving health through less smoke pollution (SDG 3), combating climate change by mitigating carbon emissions (SDG 13), reducing environmental damage through lower fuel consumption (SDG 15), and promoting empowerment and economic development (SDG 5 and 8). To accelerate transition to clean cooking, the Energising Development Partnership (EnDev) aims at a rapid scaling of clean cooking markets.

The **Promotion of Climate-Friendly Cooking: Kenya and Senegal** project is contributing to reducing **Green House Gas (GHG)** emissions and improving people's – and especially women's – living conditions by transforming improved cookstove (ICS) markets in both countries, and to achieve an accelerated and sustainable long-term market growth. At the core of the project, the **Professionalisation Approach** is implemented as a **performance-based support scheme** to establish a professional, fully commercial, and growth-oriented ICS supply chain for household stoves. In the last four years, the approach was successfully implemented in Kenya and Senegal leading to almost a quadrupling of annual sales, despite Covid-19 and the recent economic and energy crises. These two markets are projected to further expand with an annual growth rate of 15 % by 2025 and beyond.

This guide introduces the **Professionalisation Approach** by discussing preconditions, presenting key design elements, providing implementation advice and sharing early lessons learned. It is the first of three knowledge products planned, to be followed by a guide on how biomass cookstove projects can contribute to national NDC reporting and a Lessons learned report.

The Promotion of Climate-Friendly Cooking: Kenya and Senegal project is commissioned by the German Federal Ministry for Economic Cooperation and Development (BMZ) and co-financed by the Green Climate Fund (GCF), Kenya's Ministry of Energy and Petroleum, and Senegal's Ministry of Petroleum and Energy and Ministry of the Environment and Sustainable Development. The project is implemented by the Deutsche Gesellschaft für Internationale Zusammenarbeit GmbH (GIZ) as an associated project under the umbrella of the Energising Development (EnDev) Partnership. It is in line with the EnDev strategy 2019-2025 and thus EnDev's' overarching approach towards energy access for all. The target is to triple annual ICS sales by project end (after 5 years) and achieve a 6-fold increase by 2030. The project aims at significantly increasing the number of ICS users amongst rural and most vulnerable populations in both countries, directly benefitting 11.23 million people of these 1.91 million mainly rural households, including 0.61 million women-headed households and 5.57 million children. As a result, the project will significantly reduce consumption of non-renewable biomass in the cooking sector compared to the baseline situation leading to GHG emission reductions of 6.47 Mt CO₂eq during the project period and an additional 24.77 Mt CO₂eq until 2030. The scale of impact will enable Senegal and Kenya to reach their entire stated NDC targets for GHG emissions in their energy cooking sectors.

Abbreviations

| | |
|--------------|-------------------------------------|
| BDS | Business Development Services |
| CBO | Community based organisation |
| CCT | Controlled cooking test |
| EnDev | Energising Development Partnership |
| GCF | Green Climate Fund |
| GHG | Greenhouse gas |
| ICS | Improved cooking stoves |
| LME | Last mile entrepreneur |
| LNG | Liquefied natural gas |
| LNOB | Leave no one behind |
| LPG | Liquefied petroleum gas |
| MECS | Modern energy cooking services |
| MTF | Multi-Tier Framework |
| NDC | Nationally Determined Contribution |
| ODA | Official development assistance |
| UN | United Nations |
| ISO | International Standard Organisation |
| WBT | Water boiling Test |



1 Introduction

Iba Thiam is checking the metal cladding of an ICS at an ICS production workshop in Ross Bethio in Saint Louis, Senegal



1.1 Bridging the gap to universal access to clean cooking with ICS

Traditional biomass represents approximately 12 % of global final energy use and 54 % of bioenergy use (IRENA 2022) and helps meeting the cooking needs of approximately 2.3 billion people (IEA et al. 2023). Based on global trends in population growth, urbanisation, historical fuel use and fuel stacking, WHO estimates that 1.9 billion people will still lack access to clean cooking by 2030 against all commitments made regarding universal access to affordable, reliable and modern energy services (SDG 7). Despite massive interventions over past decades, firewood consumption and charcoal use are still growing in Sub-Saharan Africa, which counterbalance the declines in solid fuel use in Asia and Latin America. At global scale, the share of households using biomass and charcoal as primary fuels is expected to decrease to 25 % by 2030, but estimates of the **clean cooking deficit for Sub-Saharan Africa are at 60 % by 2030** and might be even higher due to fuel stacking (IEA et al. 2023).

Burning solid fuels for cooking in open fires and traditional stoves causes severe negative health, environmental and climate impacts. It contributes to premature death (2.3 million deaths or about 4 percent of all global deaths in 2019, HEI 2020) and forest degradation, and releases emissions of carbon dioxide and short-lived climate forcers like black and organic carbon aerosols and methane. **Total emissions from the cooking sector, representing about 3 percent of global greenhouse gas (GHG) emissions**, are estimated at 1.69 gigatons of carbon dioxide equivalent, of which 1.30 Gt (77 %) were from non-renewable biomass, 0.33 Gt from liquefied petroleum gas (LPG) and liquefied natural gas (LNG), and 0.06 Gt from electricity (UN-Energy 2023, based on FAO statistics for 2020).

IEA estimates in its Net Zero Emission Scenario an overall 870 Mt CO₂-eq reduction of GHG emissions in 2030 with an assumed energy mix of 40 % LPG, 35 % improved cooking stoves, and 15 % electricity (IEA 2022). Reducing non-renewable biomass use for cooking has therefore a significant climate mitigation potential, while at the same time delivering a wide range of sustainable development benefits, such as reducing the pressure on forests and biodiversity, reducing exposure to smoke-related health hazards, reducing the burden on women and children for collecting wood for fuel, and reducing expenses on wood fuel.

Due to this large share of emissions from the use of biomass for cooking, the transformation of the cooking sector has become a priority in many Nationally Determined Contribution (NDC) of Sub-Saharan governments. As of March 2023, **98 countries included clean cooking and other household energy-related goals in their NDCs** (CCA 2023) and many governments joined energy compacts¹ or developed national clean cooking strategies to accelerate actions on clean cooking and other energy goals. While these developments increase available finance for clean cooking, scalable approaches are needed that enable a fast and sustainable roll out of improved access.

The long-term objective of cooking sector transformation strategies is the universal access to modern energy cooking services (MECS) referring to clean cooking technologies which fulfil at least Tier 4 of the multi-tier framework (MTF) for cooking (ESMAP 2015; 2023a).

¹ Recent reporting highlighted again the big financing gap of clean cooking compared to access to electricity even in the context of Global Compacts (UN 2023).

Clarifications of key terms (based on ESMAP 2023b)

Multi-Tier Framework (MTF) for cooking – Multidimensional, tiered approach for measuring household access to cooking solutions across six technical and contextual attributes: convenience, (fuel) availability (a proxy for reliability), safety, affordability, efficiency, and exposure (a proxy for health related to exposure to pollutants from cooking activities). It uses detailed indicators and six thresholds of access, ranging from Tier 0 (no access) to Tier 5 (full access). The tier of the six attributes which is rated the lowest becomes represented as the aggregated MTF tier.

Modern Energy Cooking Services (MECS) – Refers to a household context that has met the standards of Tier 4 or higher across all six measurement attributes of the Multi-Tier Framework.

Improved Cooking Services – Refers to a household context in transition, meaning it has met the standards of Tier 2 or Tier 3 across all six measurement attributes of the Multi-Tier Framework, but not all of those for Tier 4 or higher.

Clean Cooking – Refers to a household context that has moved out of Cooking Poverty (MTF Tier 0 or 1) into Cooking Decency, with access to Modern Energy Cooking Services (MTF Tier 4 or 5), or that is in transition, with access to Improved Cooking Services (MTF Tier 2 or 3).

Climate Friendly Cooking – highlights the GHG reduction impact of clean cooking in the NDC context and is mostly defined by fuel type (share of renewable biomass) and stove efficiency.

MECS can be provided based on intermediate fossil fuels such as LPG/LNG or based on advanced fuels and related stove technologies such as electric cooking, biogas, forced draft gasifier stoves, and ethanol gel. Over past decades, a large share of access to clean cooking has been achieved with the role-out of LPG infrastructure. With LPG prices expected to grow, LPG represents an increasingly costly fossil transition technology to further expand or even just maintain consumption levels². Furthermore, reaching scale in the adoption of electric cooking, biogas, ethanol and forced draft gasifier stoves is slowed by the high efforts needed to establish reliable and affordable fuel supply chains (including power grids). Accordingly, IEA projects a persisting clean cooking deficit for Sub-Saharan Africa of 60 % and beyond even by 2030 (IEA et al. 2023).

In contrast, **improved cooking stoves (ICS) as a transitional clean cooking technology can provide improved cooking services and climate friendly cooking by generating fuel savings** of 30 %, compared to the fuel consumption of baseline stove it is replacing³. ICS can be domestically produced with available materials at low-cost and can be operated based on existing fuelwood and charcoal supply chains. ICS are already available in many markets, well adapted to local cooking habits and preferences, and affordable for the large majority of households. Due to these favourable supply and demand side characteristics, domestic ICS markets can be scaled significantly faster and at lower costs compared to (in parallel progressing) MECS technologies. However, past dissemination approaches often were focused on a highly decentralised and semi-professional production model. While there were cases in which these approaches were as successful as to reach national scale, many of these semi-commercial production structures collapsed once the external support stopped or local markets were saturated.

2 IEA estimates that recent LPG price developments already increased energy costs for 100 million LPG users beyond the affordability range of 5-10 % of household income (IEA 2022), which means that additional price subsidies would be required to comply with the MTF affordability attribute for tier 4 access (< 5 % of household income).

3 These fuel savings are best measured in the field based on a Controlled Cooking Test (CCT, Bailis 2004).

1.2 The Professionalisation Approach

Over past decades a holistic approach for building clean cooking markets has evolved which addresses gaps and needs in the three dimensions of supply, demand, and enabling environment (see figure 1 below). In many countries the policy framework and sector coordination are improving and suitable ICS products are by now firmly established as a market segment, based on extensive both laboratory and field product testing also integrating customers feed-

back on safety and convenience of the stoves. Behavioural change communication campaigns helped to increase acceptance and increased demand for ICS. But yet too often market growth remains disappointingly slow and thus the demand cannot be met as many artisanal and semi-commercial producers do not actively market their products and are not able to independently grow their business due to lacking business skills and access to finance.

Figure 1: Holistic market development approach



The **Professionalisation Approach** has evolved as an intervention strategy for cooking markets dominated by in-country produced ICS and therefore is focussing to a large extent on stove manufacturing. In markets without local ICS production and high importation of ICS from abroad, the **Professionalisation Approach** would need to be focussed on import and distribution instead (see [chapter 2.3](#)).

While following a holistic market building perspective, the **Professionalisation Approach** is focussing

on the supply side bottleneck to transform the semi-commercial domestic supply chain for household ICS into a fully commercial and growth-oriented business activity. Instead of supporting a large number of small artisanal producers without a realistic potential to establish a self-sustaining business, the **Professionalisation Approach** applies a competitive support mechanism with a strong entrepreneurial spirit and market growth perspective. This approach offers an increasing level of assistance to best-performing producers and distributors to fully



Jocelyne Gakii is assembling an ICS, holding the cladded rocket stove to carry them to the assembling section at the Steloxo production centre in Tharaka Nithi, Kenya

establish themselves as professional businesses. The **theory of change** is that only larger producers can grow and professionalise their business as they generate sufficient income and have the equity and collateral as well as often also the financial and business skills to access bank financing. Although the intervention starts by supporting hundreds of artisanal producers as well as already established intermediate producers, the aim is to establish a group of business-class stove producers who can successfully legalise their business, mechanise their production, improve their workshop premises

and production processes, increase number and qualification of staff, develop a marketing strategy, establish a distribution network, and successfully access commercial financing. These business class producers will then drive independently further market growth (sustainability) with positive employment and income effects. In turn, professional ICS markets are reaching faster the required scale to effectively contribute to SDG 7 and climate targets (NDC relevance). Business class producers with growth-oriented marketing approaches building on professional distribution networks and established access to finance can, in a subsequent step, be steered more efficiently towards specific development agendas such as inclusiveness of the market (Leave no one behind, LNOB) e.g., by using support mechanisms for advanced markets such as Results-based Financing (RBF).

Past ICS supply chain interventions showed that access to finance becomes the dominating bottleneck once producers have reached an advanced level of professionalisation. But for artisanal producers, simply disbursing small investment grants will not work. As they also lack the technical and business skills to plan and implement their required investments, grants are better provided in kind and need to be accompanied by technical and business training. Similarly, also the set-up of a rural distribution chain needs initial support. Graduating to higher levels of professionalisation and productivity is a very individual process and can take considerable time and effort. To short-cut this process for a quick scaling of the ICS supply chain, the Professionalisation Approach uses three key design elements:

- **Categorisation and competitive selection** of supported stove producers and distributors: the categories of artisanal, intermediate and business class producers, as well as basic, intermediate and advanced distributors are introduced to facilitate standardised support tailored to the specific needs of the respective producer and distributor categories. Producers and distributors must qualify for a support level and can graduate to higher levels and respective support packages.

- **Standardisation of support packages** tailor-made to the producer and distributor categories and consisting of technical and business training modules, the supply of tools and machinery or materials, and, in the case of intermediate stove producers, also possible support of workshop construction or modification, and individualised Business Development Services (BDS) including the development of a bankable business plan.
- **Performance-based support:** to incentivise performance and to avoid the disbursement of high value support packages to non-performing producers, a performance-based selection of producers and distributors is essential. Furthermore, disbursement of support packages is contingent to the achievement of predefined milestones to be reached by the producers and distributors including the payment of an own contribution or an increase of stove sales.

The Professionalisation Approach aims at the **emergence of a more centralised production model with clear advantages in quality and cost due to mechanisation of production, efficient procurement of materials and inputs, and general economies of scale**, even when considering the longer distribution chain to rural customers. The Professionalisation Approach covers therefore the full supply chain, helping stove producers to bridge the gap to their rural customers by building a distribution network that reaches from wholesalers and market traders down to last mile sales agents and installers (last mile entrepreneurs, LME) at the village level. While ultimately producers are expected to independently maintain and grow their distribution networks, it might be required to facilitate the initial set-up of distribution chains by dedicated distribution support packages for LME which follow a similar logic as the performance-based support to producers. This kick-start support is particularly relevant for (rural) areas with yet little ICS market penetration.



??? Bildunterschrift, Bild und Schrift ???

Supporting local champions in Kenya

The Greenland production centre in Bungoma County, Kenya, qualified for professionalisation support in the year 2021. At that time, they produced Kenyan Ceramic Jico (KCJ) stoves on a small scale of less than 100 stoves per month. Within a period of 2 years, they have immensely grown to selling over 1.000 stoves per month. The female owner of the production centre is very active in marketing the stoves and built a network of over 20 distributors who are stocking the stoves in different areas. Her stoves have also found a way into the neighbouring country of Uganda. The increased sales of stoves enabled additional investments such as the purchase of a second-hand tractor for the transport of raw materials for the stove production.

1.3 Purpose and Outline of the Implementation Guide

This implementation guide for the Professionalisation Approach **targets funders and implementers interested in the fast scaling of domestic ICS markets**. The concept and recommendations are based on an innovative project design to scale ICS markets: the Promotion of Climate-Friendly Cooking project - implemented between 2020 and 2025 in Senegal and Kenya, and are informed by the project's experience up to now, its design and implementation documents, the results of its mid-term evaluation, as well as additional lessons and feedback from the implementing experts.

This implementation guide for the Professionalisation Approach is structured in three parts starting with a discussion of the necessary **preconditions** (Chapter 2), explaining its key **design elements** (Chapter 3), and providing detailed **implementation advice** to project implementers (Chapter 4).

Chapter 2 presents an analysis of the **preconditions** for using the Professionalisation Approach. This assessment is guided by the question "Is your target ICS market ready for scaling?". Based on a market mapping and needs assessment exercise,

implementors can decide if the professionalisation approach addresses the key supply chain barriers of their target market. For the dimensions of demand perspective and enabling environment some best practice examples are shortly presented.

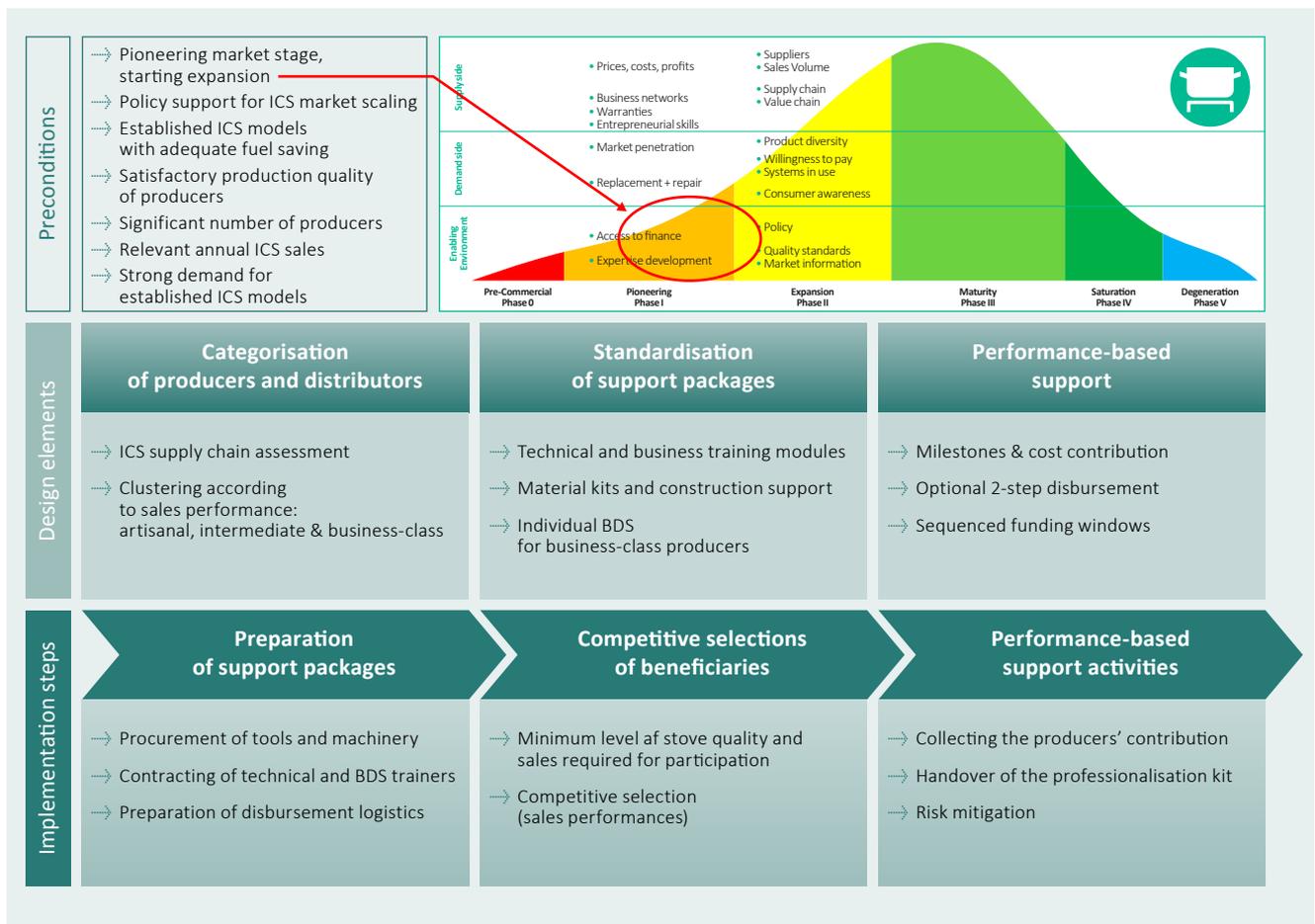
Chapter 3 presents key **design elements** for scaling ICS markets with the Professionalisation Approach: the categorisation of the target group/ICS producers, the compilation of standardised support packages, and a performance-based support to reach the degree of implementation efficiency required to scale and transform the target ICS market and its climate impacts.

Chapter 4 guides through the required **implementation steps** of the Professionalization Approach. It includes elements of a generic operational manual that can be used to detail the processes for project implementation, such as selection of beneficiaries, implementation of performance-based support, and the monitoring and verification of activities.



Assembling of the ICS and painting of the metal cladding at Steloxxy Production Centre in Tharaka Nithi County, Kenya.

Figure 2: Overview of the Professionalisation Approach

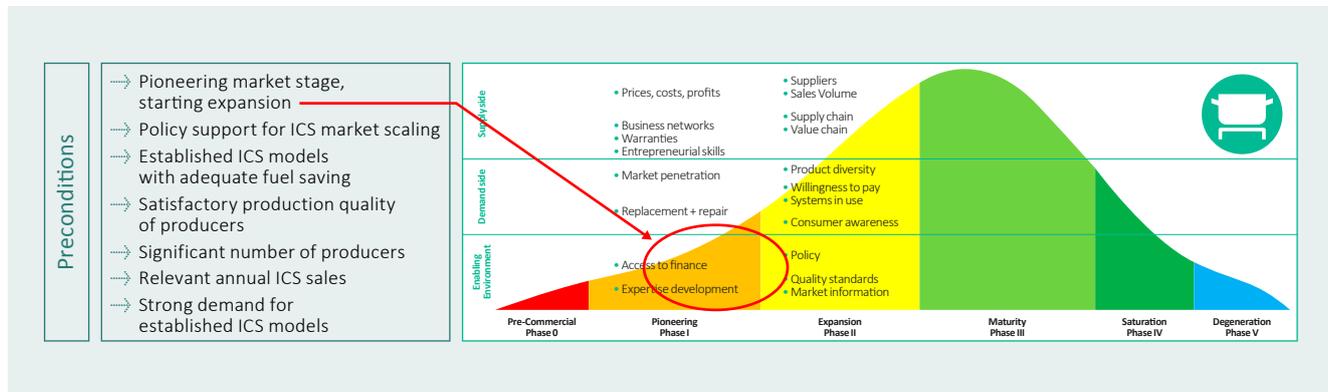


A woman wearing a blue t-shirt, a tan apron, and a colorful patterned headscarf is focused on her work. She is using a wooden wheel to shape a piece of brown clay. The setting is an outdoor production facility with a corrugated metal roof and a blue barrel in the background. The overall scene is one of traditional craftsmanship in a rural environment.

2 Is your target ICS market ready for scaling?

A member of the Gassama womens cooperative is forming the ceramic inlay of the ICS out of clay at an ICS production facility in Kaolack, Senegal

This chapter provides guidance on **assessing the preconditions** for the Professionalisation Approach by addressing the following questions: How do I know if my targeted ICS market is ready for scaling (2.1)? What aspects do I need to consider for a holistic market building (2.2)? And how can I make best use of this implementation guide for my specific market situation and resulting market building approach (2.3)?



2.1 Assess ICS market potential, market stage and market barriers

The Professionalisation Approach aims at scaling and transforming ICS markets for an ODA independent growth. It requires certain preconditions to deploy its full effectiveness: a sufficient large market potential, a minimum market stage, no market distortion by other stakeholders and addressable market barriers. The following sections provide recommendations on how to implement an ICS market assessment.

Check for a sufficient large market potential of domestically produced ICS

The relevance of transforming traditional biomass usage for mitigating GHG emissions has been increasingly recognised and a number of Sub-Saharan African countries have included the cooking sector into their NDCs, even though not all by setting clear targets. National cooking sectors differ in the share and relevance of different cooking technologies and fuels, but typically, traditional biomass cooking and improved wood fuel and charcoal stoves are still representing the dominant household cooking approach. In some countries, higher tier cooking systems such as LPG, electric cookers, biogas,

ethanol or forced draft gasification stoves are gaining relevance by policy targets, promotion programmes and market uptake.

Environmental impacts of traditional biomass cooking – the case of Senegal

In Senegal, the use of wood-based fuels (firewood and charcoal) is the largest single contributor to the energy sector GHG emission (66%). 86% of the rural population are relying on a constantly decreasing wood fuel supply, while the cooking fuel consumption is increasing with the population growth at the rate of 3.1% per year. As a result, every year, about 40,000 ha of forest are being lost because of the overexploitation of forest resources, with the share of non-renewable biomass in total biomass consumption in Senegal being 85% (UNFCCC 2017). Based on the evidence on functionality, market potential and high sustainability of use in households, the Government of Senegal included in its NDC the explicit target of an annual market growth of 800,000 ICS by the year of 2030.

Against this context, the current and mid-term market potential of improved fuelwood and charcoal stoves needs to be assessed to gauge the potential market size that can be reached by implementing the Professionalisation Approach. The market potential should be big enough to justify this massive investment into market building. If target countries prioritise and are willing to subsidise the large-scale roll out of LPG cooking as intermediary cooking fuel to be replaced by electric cooking in the long-term, market potential might be reduced and political support for improved fuelwood and charcoal stoves might represent a bottleneck. And in countries where most of ICS demand is imported from abroad, feasibility and viability of domestic manufacturing must be carefully assessed. If development of domestic market seems unrealistic, a limited implementation of the Professionalisation Approach targeting ICS distribution might be considered (see [section 2.3](#) below).

Effective demand for ICS – the Kenya baseline assessment of 2020

With 2019 demographic trends (2.7 % annual increase), by 2030 Kenya's population was projected to reach 67 million people or about 15 million households. Assuming a baseline annual growth rate for the ICS sector of 5 %, only about 50 % of the potential consumers would be reached by 2030 leaving around 7 million households still relying on the use of traditional inefficient stoves. At the same time, there was neither sufficient supply of electricity or LPG nor the available infrastructure to work towards a market transformation that would include rural areas. Ability to pay was not a major issue for basic ICS, except for the very poor. The vast majority of consumers (80–90 %), including many of those who fall below the poverty line of less than USD 1.25 per day, were deemed able to afford paying USD 3–7 for basic ICS. Financial analysis of the fuel-saving costs for a range of targeted ICS products indicated a pay-back for consumers within a range of 2 to 3 months.

The Professionalisation Approach aims at building a commercial ICS market. It should therefore be analysed what type of ICS actors are already active in the market and in how far market compatible approaches are pursued. In many countries, the ICS sector is characterised by large subsidy programmes supporting production and particularly distribution of ICS by aggregating demand and providing free transport logistics. These programmes are financed by public, philanthropic, and increasingly carbon finance sources. In many cases, these interventions have a market distorting effect as they reduce the end-user price expectation to levels unreachable for the commercial market. The current and planned subsidies in the ICS market need therefore to be carefully assessed regarding possible conflicts with the commercial market building objective of the Professionalisation Approach.

Assessing the potential future scale and impact of carbon financing

The potential future impact of the voluntary carbon market is difficult to predict. Cooking solutions represent today nearly 20 % of all registered carbon projects in the voluntary market and over 80 % of these are on ICS, leading between 2010 and 2022 to 63 million carbon credits issued by ICS projects, while for the remaining years until 2030 an additional 463 million carbon credits have been forecasted. This assessment considers that with the increasing relevance of meter-based MRV approaches mostly applied for MECS, the share of ICS might decrease. Uncertainty of forecasts are increased by the fact that the new Article 6 mechanisms risk introducing an overlap between regulated and voluntary carbon markets, as already 98 countries report on clean cooking as part of their NDC. The Gold Standard has announced that in the future it will consider allowing offsetting claims made against the use of post-2025 credits only if these are correspondingly adjusted (Galt et al. 2023).

Assess if the targeted ICS market has at least reached a pioneering stage

If the transformation of the traditional cooking sector with improved fuelwood and charcoal stoves can be confirmed as a relevant policy target and shows a large market potential with significant scale of GHG

emission reductions, additional market intelligence is required to understand if the professionalisation approach is adequate or can be adapted to the current development stage of the ICS market. To answer this question, the development stage of the ICS market needs to be analysed, starting by tracing the existing value chain.

Different stove types and respective supply chains

Stove types supported in the **Kenyan** pilot included stoves types which needed local installation.

| Jiko Kisasa portable | Jiko Kisasa inbuilt/fixed | Rocket stove with insert | Rocket stove with brick and cement |
|---|---|--|---|
|  |  |  |  |
| Firewood | Firewood | Firewood | Firewood |

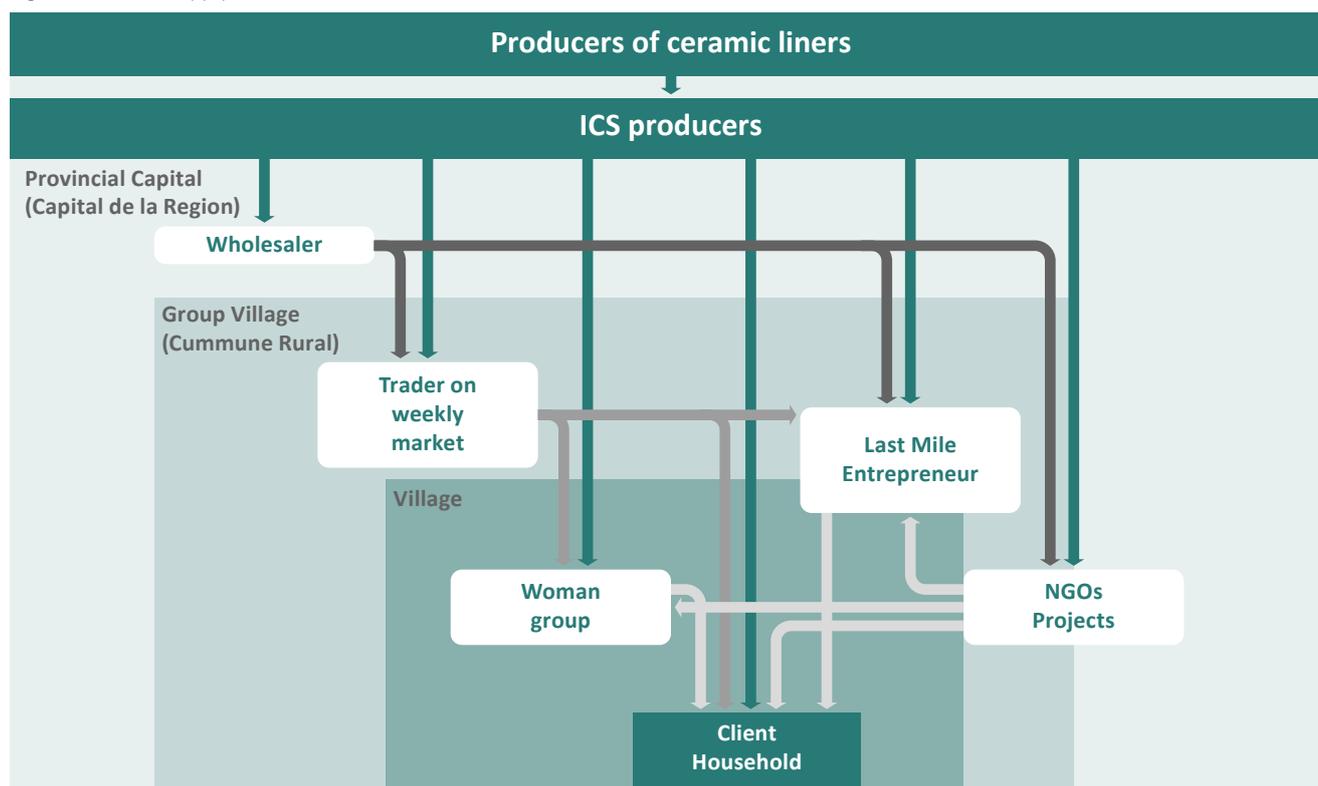
Stoves supported in the **Senegal** pilot where mostly metal or metal clad stoves.

| Jamba charcoal stove | Jamba firewood stove | Taaru | Sakkanal Multi-Pot | Sakkanal Mono-Pot |
|---|---|--|---|---|
|  |  |  |  |  |
| Charcoal | Firewood | Charcoal | Charcoal and Firewood | Charcoal and Firewood |

ICS are produced either as ceramic stove, metal stove or a combination of ceramic liners with metal cladding. While the latter two are self-supporting structures, many fully ceramic stoves need to be directly mounted in the kitchen, which requires some brick layer or clay work skills. Accordingly, the ICS value chain typically consists of suppliers of

raw materials (amongst others clay and/or metal), stove producers (potters and metal workers), and various forms of distributors in the supply chain (see Figure 3 below) as well as the public sector and civil society partners that often fulfil supporting roles in generating demand or even supporting distribution of ICS.

Figure 3: The ICS supply chain



The actors in ICS construction may comprise suppliers of inputs materials, individual artisans (of ceramic liners, metal cladding, and/or complete ICS), cooperative-like groups (mostly of women), larger ‘workshops’, and rarely industrial manufacturers. The actors in ICS distribution may comprise importers of industrially produced ICS, wholesalers at regional capitals, small NGO projects on food security, forest management etc. (who work as a demand aggregator for their target communities), and Last-Mile Entrepreneurs (LME) such as local traders at weekly markets (usually selling ICS next to the vendors of charcoal or firewood) and local sales agents which might be individual entrepreneurs, women’s groups, or Community Based Organisations (CBOs). In case of fully ceramic stoves, the sales agent also acts as stove installer, mounting the ceramic stove with fresh clay or brick work directly in the kitchen.

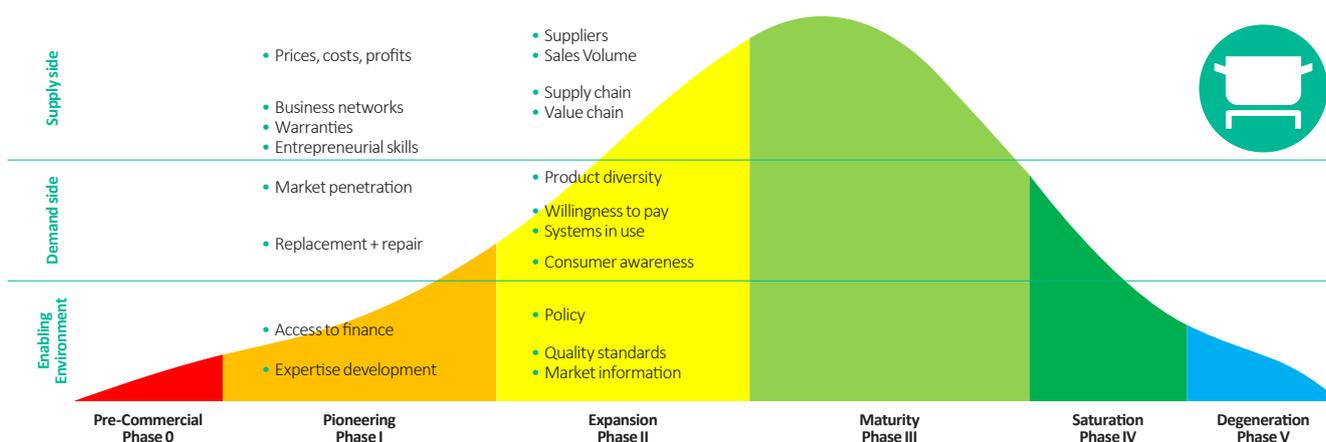
Public sector or non-profit organisations support this sector in other value-chain functions which individual producers are not able to fulfil, i.e., testing, innovation and research & development (R&D),

quality control and awareness raising to generate demand. These include national, regional and local government authorities (policy framework, standards, and investments in public health, safety and environment campaigns), NGOs that invest in public-good informational campaigns, universities, or institutes that work on testing, innovation, and quality-control.

It is recommended to implement a systematic ICS market assessment considering enabling environment, as well as demand and supply side perspective. The assessment can be facilitated by established tools such as EnDev’s Market Development Scorecard (see textbox). As the professionalisation approach focusses on the supply chain, the current capacities and constraints of ICS producers and distributors needs to be well understood. It is important to consider regional differences as ICS as a product as well as producers might be well established in some, often peri-urban, regions, while markets do not yet reach other parts of the country or remote rural areas.

Both projects in Kenya and Senegal used the **Market Development Scorecard** (EnDev 2019) to systematically plan and monitor market building interventions in the energy access sector. The scorecard distinguishes 6 market phases from 0-Pre-commercial up to 5-Degeneration (see figure below) which are described by 19 aggregated indicators (covering supply and demand side as well as the enabling environment) which are further detailed by 49 variables. The scorecard guides the initial market assessment and visualises changes over time in any of the 19 market indicators. It thus provides a differentiated picture of the market development stage.

Figure 4: Market development phases



| General market development phases | | | | | | |
|-----------------------------------|--|--|--|---|--|--|
| | Pre-Commercial Phase 0 | Pioneering Phase I | Expansion Phase II | Maturity Phase III | Saturation Phase IV | Degeneration Phase V |
| Description | In the context of developing countries, the time when a certain (existing) product/service has not yet reached a certain market or only a few units of this product are traded within the country on demand. | The new product is introduced into the market and is relatively unknown and has not yet earned the trust of consumers. As only small amounts of the product are bought by "early adopters", the focus lies on awareness raising and consumer gaining activities (high marketing costs, usually no or low profits). | As the product gains popularity, new participants (competitors) enter the market. Turnover increases at a very high rate and the product starts generating high profits. | This is usually the longest and the most profitable phase. Demand is not growing at such a high rate anymore, and product prices drop. Due to the increasing competition for market share, profits decrease at the end of this phase. The number of suppliers decrease and the remaining ones increase their market shares. | The competition for market shares becomes even harder. | Turnover and profits decrease drastically; the product/service is replaced by a new product. |
| Adopter category | Total potential customers (100%) are divided into different categories during the different stages of market development. | | | | | |
| | Innovator 2-5% | Early Adopters 10-15% | Early Majority 35% | Late Majority 35% | Laggards 5-10% | Late laggards 0-10% |

A detailed description of the Market Development Scorecard and templates can be accessed on [Energy-pedia](#).

At the start of the two pilot projects in Kenya and Senegal, the ICS supply chain was characterised by 130-250 established ICS producers with annual sales of 200,000-300,000 ICS. Local small stove artisans (80-90 %) and small enterprises dominated the ICS market. The markets could be described as in the pioneering phase 1 with regional sub-markets and producers already entering the expansion phase 2.



Daniel Kitheka is stacking the ceramic parts of the ICS in the kiln for firing at Mully Childrens Family production center, in Yatta, Kenya

Identify key barriers to scaling up ICS supply chains

A barrier analysis of the ICS supply chain should confirm if the three key barriers identified for the development of the Professionalisation Approach are valid for the targeted ICS market or if other or additional barriers need to be considered.

The following three key barriers of ICS supply chains are addressed by the Professionalisation Approach:

1. Weak technological basis and capacities of stove producers to improve production processes and product design to suit consumer needs. There is a huge potential to achieve efficiency gains and improve productivity in existing ICS manufacturing processes, but the companies lack basic assets, technological expertise and access to knowledge to do so. Instead, stove producers

contend with low margins, rising costs of materials (particularly for metal components), and low managerial and business planning capacity. There are also quality control issues, which include the high cost and logistical challenges of accessing stove-testing services, and the limited technical ability of producers to ensure the quality of their products.

2. Under-developed ICS supply chain. Even when consumers are aware of an appropriate cooking solution, it is often unavailable or difficult to access due to an under-developed ICS supply chain. Although access to basic ICS is typically not a challenge in most urban environments, even basic ICS solutions do not reach remote rural areas. The distribution chains often stop at the traders of weekly markets that do not actively reach out to clients in villages. The large majority of ICS producers are small-scale, often family-based

and not formally registered artisanal enterprises. These ‘companies’ lack basic business experience in terms of marketing or business planning, let alone experience with developing the supply chain. Their level of sales and revenues are just sufficient to cover basic running costs, but clearly not sufficient to accumulate sufficient working capital for stronger supply chain development and delivery of ICS to end users. Most of these small producers sell their ICS only at their workshop or have a very limited distribution outreach (handcart distance).

3. Limited access to finance. The prevailing modality for ICS producers to finance their business development is either through self-financing or, for larger orders, based on up-front payments from the clients, with the balance received upon delivery. The fundamental reasons preventing small ICS producers to access market-based finance are the following:

- **Informal business nature.** The majority of ICS producers are unregistered and do not possess the necessary documentation required by commercial banks.
- **Lacking risk guarantee nor own finance or property.** Local micro enterprises in the stove sector have neither sufficient equity, nor guarantees or registered assets that would qualify as a collateral for a bank.
- **High interest rates.** ICS producers that have approached micro-finance institutions indicate the high interest rates of 20+ % as a main deterrent.

- **Unfamiliarity with loan applications/business plans.** Formal medium or long-term business planning is not common for small and informal ICS producers. Neither do banks or MFIs have experience in conducting due diligence on ICS business plans.

Key barriers identified in Senegal’s ICS supply chain at project start

In Senegal, more than 90 % of the ICS sold countrywide in 2016 were charcoal stoves that mainly served urban households whereas rural consumers did not have access to charcoal and needed wood burning ICS. The design of the most popular ICS in Senegal was already 30 years old. The stoves were very well adapted to the cooking needs and household size of the clients in Senegal. However, the designer at that time focussed on a solution that suited low-tech, hand-made production but was limiting the application of efficient production concepts.

Access to finance remained difficult for most ICS producers and was cited as the principal limitation for the development of the private sector. Traditional commercial banks tended not to service the informal sectors of the economy but worked with registered companies and established entities typically requesting 100 % collateral on loans. Even the micro-finance sector turned down approximately 80 % of loan applications from small and medium enterprises (SMEs), collateral conditions were lower but interest rates too high to facilitate long-term investment in ICS production.



2.2 Consider demand perspective and the enabling environment

This guide is focussed on scaling ICS supply chains; however, also demand side barriers and a conducive enabling environment are relevant factors for a successful intervention and need to be considered in the case that the targeted market is not yet sufficiently mature in these dimensions. A helpful and comprehensive overview on preparation steps, approaches and building blocks is provided by a recent ESMAP practitioners' guide on clean cooking (ESMAP 2023b).

Demand side barriers

Typical demand side barriers to the expansion of the ICS market can be summarised as:

1. Low awareness of the risks associated with traditional cooking practices and the multiple benefits of ICS, as well as their importance for family expenses, health, and the environment. The lack of awareness about ICS is particularly pronounced in rural areas, where education levels and access to market information tends to be lower, while established traditional practices play a more dominant role in guiding families' behaviour and decision-making. The most important reasons for poor consumers to invest in ICS are often not the obvious reasons such as fuel expenditures and potential cost-savings, but reasons of convenience, safety, time saving, as well as reduced smoke exposure. Consumers must be introduced to all the stove benefits before they will invest in the first ICS and reinvest in a replacement ICS.

2. Low willingness of the consumers to adopt a new stove: even though consumers are increasingly aware of the numerous benefits of ICS, the level of such awareness and trust in new products tends to be lower in rural areas, where consumers have less access to national marketing and awareness raising campaigns. In such areas, dedicated awareness activities should be

considered involving local partners and local marketing campaigns to win trust and generate demand for the better cooking services the ICS provide.

3. Lack of confidence in new products/vendors:

Poor consumers are by nature risk-averse when it comes to the adoption of new technologies. This risk aversion expresses itself in scepticism about the stated benefits of stove adoption (e.g., stove seller promises of quick break-even periods due to fuel savings), and in a lack of confidence about stove durability and after-sales support. Given the quality issues affecting general consumer durables in many African markets, consumers' low-risk appetite is not entirely unwarranted. Consumer exposure is thus critical to building confidence in new cooking technologies and trust in stoves and vendors.

Full scale national awareness campaign in Senegal

For the **Promotion of Climate-Friendly Cooking** intervention in Senegal, more than half of the 15,000 villages in Senegal have been directly targeted with village level activities including sensitisation of village leaders and women groups, road-shows and cooking demonstrations with cultural programmes, participation in (agricultural) trade fairs, and local radio reporting and spots. Additionally, nation-wide outreach including TV reports were supported by 45-second TV spots which have been screened before and during a popular soap playing in rural areas of Senegal. Product placements of ICS have been included into the soap itself, creating the feeling of ICS being well established and appreciated in the rural life in Senegalese villages. The activity was accompanied by a social media campaign using billboards and pop-ups on platforms such as YouTube and Instagram.



Naomi Ngotho the owner of Naomi production center is stacking the ceramic parts of the ICS for drying. The workshop is located in Muranga, Kenya.

Past ICS interventions have gathered a wealth of learnings regarding the implementation of behavioural change campaigns (BCC). For a recent overview see the EnDev Learning Product: [Behavioural change promotion toward cleaner cooking solutions](#) (EnDev 2021).

Enabling market environment

Many challenges at policy, institutional and co-ordinational level need to be addressed to create a favourable market environment for ICS sector growth. Clean cooking issues are often not integrated into the wider sector planning as the focus is often more on electrification and not on providing sustainable energy access to modern cooking. For the creation of a conducive market environment, it is important to establish a new spirit of transformation amongst the existing and new stakeholders of the sector and increase the enabling conditions for growth. These can be, for example, increased support for testing and labelling, local government involvement in awareness campaigns, and public- policies supportive of small businesses. Strengthened capacities in the public sector to revise relevant policies promoting ICS use, to monitor sector development, and

especially to report on NDC clean cooking targets are also necessary.

Improving the enabling environment for clean cooking in Kenya

In Kenya, the project supported several clean cooking sector activities, such as:

- Preparation of the National Clean Cooking Strategy.
- Development of the Knowledge management strategy and hub/ portal to support the sector in managing data.
- BCC Strategy to support the sector in awareness creation.
- Support the Kenya Industrial Research and Development Institute (KIRDI) with ICS quality stove surveillance testing for Kitchen Performance Test (KPT), Controlled Cooking Test (CCT) and Water Boiling Test (WBT) to measure if the stoves available in the market meet national and international standards.
- Support County Energy Plans in 9 counties to integrate clean cooking aspects in line with the national reporting framework (INEP).



2.3 Choose your focus and approach

The assessments of the targeted market's potential, market phase and market barriers (described above) provide the context information to decide on whether and how to make use of the Professionalisation Approach, but also the available budget should be taken into consideration.

1. Markets dominated by imports are hardly suitable for the Professionalisation Approach.

If the target market mainly builds on imported ICS and developing domestic production capacities is not considered a viable option, a large part of this implementation guide does not apply. However, some aspects of the support activities for stove distributors could be of interest. As local producers do not play an important role in an import-dominated market, it needs to be checked who (e.g., importers, wholesalers or integrated distributors) stands at the starting point of the national supply chain. All support activities would need to be adapted to this different stakeholders' characteristic and needs.

2. Markets in the “pre-commercial” market phase need an extra amount of support, also for a longer time than with the standard Professionalisation Approach.

If the domestic target market is largely still in a “pre-commercial” market phase, you might consider a pilot phase to prepare existing producers for the Professionalisation Approach (identify producers with a market-oriented approach, advise on business development, build performance track records).

Or you need to consider an extended project duration to achieve the targeted milestones for the performance-based support. You might also consider the need for a stronger demand side and enabling environment support and respective budget share.

3. Markets in the “pioneering stage” are best suited for the Professionalisation Approach.

If the domestic target market has reached a “pioneering” market phase, is entering the market expansion phase (see [section 1.1](#)) and previous support activities have documented business activities and performance at producer level, you can make best use of this guide, provided you have the budget required for such a massive intervention and of course you need also to address demand side issues and an enabling environment as far as required by your assessment.

4. If you are lacking the budget required for such a massive intervention you can still make use of this guide, but focus your activities on the core problem identified for your target market and possibly limit your activities to a pilot area.

By demonstrating successful solutions that can be replicated and scaled, you can create lighthouse examples to access additional funding for scale up in a subsequent project phase. But even with limited funds, you still need to consider demand side issues and the enabling environment.



3 Key design elements to scale ICS supply chains

Mbaye Faye is welding the metal for the metal cladding of the ICS at a production facility in Fatick, Senegal

This chapter focusses on **design elements** required for the planning (and also the development of a funding proposal), while detailed implementation steps are discussed in the subsequent chapter. Below, the categorisation of ICS producers and distributors (3.1), the standardisation of support packages (3.2), and performance-based milestones (3.3) are presented as key concepts of the ICS professionalisation approach.

| Design elements | Categorisation of producers and distributors | Standardisation of support packages | Performance-based support |
|-----------------|--|--|---|
| | <ul style="list-style-type: none"> → ICS supply chain assessment → Clustering according to sales performance: artisanal, intermediate & business-class | <ul style="list-style-type: none"> → Technical and business training modules → Material kits and construction support → Individual BDS for business-class producers | <ul style="list-style-type: none"> → Milestones & cost contribution → Optional 2-step disbursement → Sequenced funding windows |

3.1 Categorisation of ICS producers and distributors

ICS producers

Depending on the specific design of the ICS, the production process consists of the fabrication of the ceramic stove only or of an additional metal cladding that spans the ceramic insert. Pottery and metal work are two very distinctive trades and all types of work organisation can be observed on the market: In some cases, integrated producers cover both pottery and metal works. In other cases, the metal stove producer is procuring ceramic inserts as pre-product or in contrary, the ceramic producer is contracting a metal worker to do the metal cladding. During the market mapping and consultation, all three configurations might be considered as stove producers. Alternatively, the strategical focus might be placed on one dominant producer model. As pottery is a trade with

strong women representation, while metal works is mostly dominated by men, this strategic choice might imply also a gender dimension. The Professionalisation Approach represents an advanced ICS intervention and some data of earlier ICS programmes should be available in most country contexts. It is recommended to carefully consider also modalities of previous support schemes to anticipate and strategically address expectations of the target groups. E.g., stove producers might be used to get free support and to have NGOs taking care of distribution. Additional information might be provided by sector studies as implemented in many countries by SEforAll, ESMAP, or the Clean Cooking Alliance. In addition, an ICS sector mapping could be implemented as preparation of or directly be combined with the ICS stakeholder consultation.

Kenya and Senegal – building on existing sector assessments and market intelligence

For the ICS market assessment, the pilot projects in Kenya and Senegal could build on over a decade of EnDev support activities and ICS sector monitoring.

In **Kenya**, the ICS market had reached by 2019 a volume of about 240-300 thousand ICS sold annually by approximately 130 producers and 4,000 last-mile entrepreneurs (LMEs). These sales satisfied most of the demand of the estimated 37 % of Kenyan households using ICS. Local small stove artisan and small enterprises dominated the ICS market for domestically produced stoves with 80 % of sales and there were only two business class producers manufacturing monthly over 1,000 stoves.

Senegal had by 2019 about 250 ICS producers with annual sales of 200 thousand ICS. Like in Kenya, the market was dominated with 35 % of sales by artisanal producers. A group of 31 ‘intermediate producers’ had invested in mechanical machines and employed additional staff reaching monthly stove sales between 100 and 1,000 stoves. Only two business class producer sold more than 3,000 ICS every month.

Consultations with ICS producers and, if existent, their associations are required to identify their current production levels and specific context situations and challenges in the targeted market. This information is required to elaborate the standardisation of support packages and performance-based milestones as presented below. The consultations should cover ICS producers at different production levels and in different regions to ensure that the support packages are also addressing their needs.

Consultations should also include the topic of ICS distribution. Existing distribution chains can be tracked starting from the ICS producers to analyse the extend of the supply chain. Especially small producers also directly sell to end customers, but producers need to build distribution networks if they truly aim for increased scale of production and sales. To gain further insights local NGOs can be consulted to understand barriers to local ICS distribution.

The ICS supply chain professionalisation approach proposes a categorisation of ICS producers into the groups of (a) **artisanal**, (b) **intermediate**, and (c) **business class** producers, which might be roughly associated with the corresponding market phases. For each category, minimum monthly sales thresh-

olds and possibly additional requirements need to be defined, these can differ based on the country context – numbers below are suggestions based on the experience in Kenya and Senegal:

A Artisanal, small-scale producers dominate in the **pre-commercial market phase**. They might be characterised as informal family businesses with 1-3 (not formally employed) workers selling up to e.g., 100 stoves per month. To bring artisanal producers to an intermediate level, they typically need technical training to improve the production process as well as basic business skills. Attention should be given to the specific needs of female producers.

B Intermediate, medium-scale producers drive the **pioneering market phase** while artisanal producers still represent a relevant share of production. Intermediate producers might be characterised by a larger workforce, a certain degree of division of labour (e.g., 3–7 workers) and higher sales rates of up to e.g., 1,000 stoves per month. Beyond the basic technical and business skill training, intermediate producers need to further professionalise and formalise their business activities and have to considerably invest in upgrading their production processes and facilities to reach business-class level.

C Emerging **business class**, large-scale producers indicate the **expansion market phase**. Business class producers are characterised by formal business structures and employment and relevant turnover (monthly sales e.g., beyond 1,000 stoves) They fulfil therefore the preconditions to

apply for commercial financing (loans) and are expected to further scale their production independently or with only limited external support (such as RBF or concessional loan facilities), as well as to take ownership of marketing and distribution chain development.

Clustering of stove producers in Kenya and Senegal

Based on consultations, the ICS producers were clustered according to monthly sales figures into the three categories of artisanal, intermediate and business class producers.

The minimum sales threshold to participate in the professionalisation support could accordingly be set at 30 ICS sales per month for artisanal producers, at 100 ICS sales per month for intermediate producers, and at 1,000 sales per month for business class producers.

| Final producer category | Production level | Monthly stove sales | Number of producers (Kenya 2017) | Number of producers (Senegal 2017) |
|--|--------------------------|---------------------|----------------------------------|------------------------------------|
| Artisanal (30-100 monthly sales) | Occasional or individual | Less than 10 | 56 | 77 |
| | | 10 to < 30 | | 69 |
| | Family or group | 30 to < 100 | 46 | 82 |
| Intermediate (100-1,000 monthly sales) | Small | 100 to < 300 | 23 | 23 |
| | Large | 300 to < 1,000 | 3 | 4 |
| Business class (Above 1,000 monthly sales) | 1 | 1,000 to < 1,500 | 1 | 0 |
| | 2 | 1,500 to < 3,000 | 1 | 0 |
| | 3 | 3,000 and more | 0 | 1 |
| Total | | | 130 | 256 |

The aim of the Professionalisation Approach is to build national stove markets able to cater to the large and growing household demand for ICS. Not all competitors will survive in a professionalising and consolidating market. Still, the successful ones will grow their business, increase their staff and thereby offer employment. To maximise employment impacts, the technical and business training provided should include units on equal opportunities and gender as well as on health and safety. A professionalisation of the production also creates new work profiles in administration, accounting and marketing, which are often more gender open compared to metal works.

ICS distributors

For the support of ICS distributor groups, a simple categorisation of existing distributors by monthly sales performance (see textbox below) can be used for offering standardised and performance-based support packages. If the expansion of the ICS supply chain into new (rural) areas is targeted, initial support of last mile distribution executed by independent entrepreneurs/sales agents and women groups is recommended. For the more aggregated market functions of regional wholesalers and market traders the support is instead provided indirectly by supporting ICS producers to build their regional and national retail networks.

Categorisation of stove distributors

Building on an assessment of the distribution chain and typical monthly turnover of key actors such as larger wholesaler or retailers and smaller last mile entrepreneurs, a simple categorisation by monthly sales can be implemented.

| Distributor category | ICS wholesalers/retailers (monthly ICS sales) | ICS Last -mile entrepreneurs (monthly ICS sales) |
|----------------------|--|---|
| Basic | 50 – 200 | 15 – 30 |
| Intermediate | 200 – 500 | 30 – 50 |
| Advanced | > 500 | > 50 |

Especially the support needs of LME should be assessed in more detail to develop respective support packages. While metal stoves (or ceramic stoves with metal cladding) can be free-mounted and do not require installation service, the purely

ceramic stoves need to be directly installed in the user's kitchen. Ceramic stoves therefore require some additional pottery or bricklayer skill by the sales agent who acts in this case also as stove installer.



??? Bildunterschrift, Bild und Schrift ???



3.2 Standardisation of support packages

Offering support packages consisting of technical and business training modules as well as large kits of materials and machinery to a great number of ICS producers and distributors requires a standardised approach. Standardised support packages are developed for all lines of activities to boost ICS production and ICS distribution.

Professionalization of ICS production

The professionalisation of ICS productions is implemented based on four support packages addressing

specific producer categories as presented in table 1 below. With increasing level of professionalisation, the number of (intermediate) producers decreases which enables certain tailor-made support elements such as workshop construction or modification, while tailor-made BDS is provided to the few producers reaching business class level to improve their access to finance.

Table 1: Support packages for professionalisation of ICS production

| Support package | ICS producers | | |
|---|--|---|--|
| | Artisanal Level 30-100 ICS/month | Intermediate Level <1,000 ICS/month | Business class level >1,000 ICS/month |
| 1. Professionalisation kit | Standardised base kit offered in different sizes (incl. hand tools, machines, electricity supply and electric machines, Tuck-tuck tricycle, safety equipment). | Standardised base kit in different sizes. Optional top-ups: <ul style="list-style-type: none"> • advanced machinery • workshop construction or extension • pick-up truck | |
| 2. Technical and business training | Use of equipment, improving technology, materials, production processes & work flow, health & safety at workspace, quality control & certification. | Similar as for artisanal producers, plus: <ul style="list-style-type: none"> • monitoring of stocks, • financial literacy and management, • ICS brand development and marketing. | Monitoring of stocks, financial literacy and management, ICS brand development and marketing. |
| 3. Distribution chain facilitation | | Facilitate business relations between ICS producers and ICS distributors (wholesalers, retailers, and LME incl. women groups), as well as collaboration with existing distribution infrastructure of other sectors. Support of marketing initiatives (market activation, branding and promotional events) for producers and distributors. | |
| 4. Access to finance | | | Development of a business and finance plan for (M)FIs and equity investors (market assessment, marketing strategy, IRR calculation). |

1. Professionalisation kits

Professionalisation kits are offered to ICS producers to facilitate their transition to a higher level of productivity (artisanal to intermediate level; intermediate to business class level). The **professionalization base kits** offered to artisanal and intermediate producers comprise a set of hand tools (e.g., pliers, hammer), manual machines (e.g., roller, jenny, cutting machine), electric machines (e.g., welding machine, compressor for spray painting), safety gears, workshop furniture, container (for storage) with hangar (for shade), transportation (e.g., tricycle/motorbike transporter), etc. This standardized base kit should be offered in different sizes to accommodate the specific requirements of different producers. The professionalisation kits are disbursed upon achievement of performance milestones (see following [chapter 3.3](#)). Producers need to contribute 20 % of the cost of the kit for each disbursement in advance. Orientation on the possible content of the professionalisation kit is presented in [chapter 4.1](#).

Intermediate producers get access to the same base kit⁴ but also benefit from an extended support offer. The rationale is to support intermediate producers to not only reach higher sales but also legalise and formalise their business and build an asset base which increases their acceptability as loan-clients of the finance sector. Intermediate producers which already have contributed their 20 % cost share to the base kit can therefore choose from three additional top-ups:

- To get advanced machinery not included in the base kit, provided they are willing to pay their 20 % cost share.
- The establishment of a proper workshop building either as custom-made construction or by pre-fabricated/ container-based elements. Total cost of such constructions can reach EUR 35,000 and even a 20 % cost contribution is far beyond the investment capabilities of intermediate producers. Instead, qualified producers need to secure land (by purchase, long-term lease, or other legal arrangement) as own contribution.

- The procurement of a pick-up truck to facilitate transport of construction materials and finished stoves. Due to high costs in the range of EUR 10,000, the producers' cost contribution was set at 10 %, as 20 % proved to be unfeasible even for intermediate level producers.

These highly desired and costly assets should be subject to performance-based support and target intermediate producers with high potential to achieve the business class level (see [section 3.3](#)).

2. Technical and business training and supply chain facilitation

The professionalisation of ICS producers is going beyond the offered kits for access to machines, tools and materials. To really reap a benefit from the professionalisation kit, the producers need both improved technical skills as well as to change their business mind-set, which is facilitated by the provision of technical and business training.

- **Technical trainings:** producers and their teams must learn how to use the new devices correctly, safely, and efficiently. New equipment often requires a re-organisation of tasks within the team of workers, as well as the spatial organisation of the workshops. Producers also need to understand the importance of quality control & certification, social standards, health and safety precautions, and the needs of environmental management as part of their growth process.
- **Business trainings:** Success is not only related to production, but also to sound business and financial management. For artisanal producers, this is limited to basic business skill training. For intermediate and business class producers, this also includes modules on monitoring of stock and supplies, financial bookkeeping, staff management, marketing and development of own ICS brands.

⁴ An exception would be the case that artisanal graduate to intermediate producers and participate in subsequent calls, for which they cannot receive the same base kit again.

The exact composition of technical and business training should be based on the needs assessment. Training content and procedure should follow a gender sensitive approach and it is recommended to prepare a Gender Assessment and a Gender Action Plan as part of any stove intervention, for further information see the programmes Gender Action Plan (GIZ 2019) and EnDev's Operational Guidelines for mainstreaming Gender (EnDev 2023a; 2023b).

Technical and business training offered in Kenya and Senegal

For the pilot projects in Kenya and Senegal, the following types of trainings were offered to artisanal stove producers:

- Technical trainings on operation and maintenance of advanced tools and machines.
- Improving workshop-organisation, production processes, quality control, health & safety, and environmental protection at workspace (including dedicated trainings for women).
- Basic entrepreneurship/business management trainings (under consideration of specific training needs for women).
- Support producers to achieve quality certification of their products according to national or international standards.

Intermediate producers received the same basic training modules but benefited also from individual business coaching and additional training modules:

- Advanced entrepreneurship/business management training (financial literacy, monitoring of stocks and finances, business skills).
- Marketing training to develop own stove brands with product name, logos, and display of quality certification.
- Requirements of the finance sector for loan application regarding quality and completeness of loan documents.

3. Distribution chain facilitation

To scale not only production but actual sales, producers need to develop sales strategies, identify distribution channels, and build their own distribution network. To this end producers are supported to establish business relations with ICS distributors, as well as to collaborate with existing distribution infrastructure of other sectors. This may also include support of marketing initiatives such as promotional events, e.g., at rural trade fairs. In case of a dedicated support package on expansion of distribution and retail chains (see [next chapter](#)) the linkage of these new distribution network to the existing producers is facilitated as well.

4. Access to finance

To address the access to finance barriers, the approach is not to first change the conditions offered by commercial banks to reach the (mostly informal) ICS productive sector, but rather to change the nature of the ICS sector through its progressive formalisation and professionalisation so that it can ultimately successfully approach the financial sector (or other finance providers). This is an integral part of the sector transformation objective of continuous and sustainable sector growth beyond ODA-support and part of the exit strategy. The support is therefore focussed on ICS producers who have reached business class level displaying both the ambition and the means to further invest into scaling their stove business.

The access to finance support includes capacity building for business class producers to engage proactively with the financial sector (or financial providers) to obtain commercial financing to sustain the steep growth path supported by the professionalisation approach.

The project will work with the business class producers to:

- further improve and detail their business plans based on realistic market assessment and marketing strategies;

- identify investment needs and profitability and risks based on cash flow projections and IRR calculations;
- develop business case documents for loan applications considering requirements of the finance sector (quality and completeness of documents, finance language etc.).

The technical assistance will be designed in partnership with local financial institutions. In parallel, (M)Fis will be educated about ICS sector specifics, including the nature, type and value of production assets, and will be supported to design new financial products, which better suit the ICS sector.

Expansion of distribution and retail chains

The development of a commercially viable ICS supply chain is paramount for the sustainability and exit strategy of the professionalisation approach. Priority is therefore given to the support to ICS producers to develop their own distribution networks and marketing strategies (see above). While producers are supposed to independently maintain linkages with regional wholesalers and retailers, massive investments into the development of last-mile entrepreneur (LME) networks, especially into not yet covered rural areas cannot be tackled by ICS producers alone. Therefore, it is recommended to provide additional support to professionalise last-mile distribution.

Table 2: Support packages for the expansion of ICS distribution and retail chains

| Support Package | ICS wholesalers/retailers | ICS Last -mile entrepreneurs |
|-----------------------|---|---|
| Distribution training | Technical and entrepreneurship training on ICS distribution and retail | Tailormade technical and entrepreneurship training on ICS sale and installation Specific business training for women(groups) |
| Distribution kits | First tranche with generic promotion materials, T-shirts, caps, bags. Additional tranches based on sales performance including parasol, overalls, vinyl banner, display stand, stove models, branding of materials, local media spots, trade fair participation, and a tuktuk tricycle. | |

The supply chain facilitation activities are based on the mapping of the current ICS supply chain (see [section 2.1](#)) starting from the ICS producers. As the ICS producers expands into new markets/regions, the cost and effort to establish sales structures and to conduct marketing activities and training of last mile sales agents increases steeply.

While ICS producers already benefit from material support including means of communication and transport (smart phone, tuck-tuck tricycles/pick-up truck, see previous section), additional support packages are employed to kick-start and incentivise professionalisation of LMEs and women groups, which again are linked to ICS producers, wholesalers or market traders (see also table 3 above):

- **Technical and entrepreneurship trainings** are offered to new and existing (refresher trainings) LMEs, with a special focus on business training for

women(groups). Wholesalers and retailers might be included in business or even general technical trainings to increase familiarity with the product.

- **Performance-based distribution kits** help to incentivise the professionalisation of LME. Different items are offered depending on the monthly sales performance starting from small promotion materials like flyers, T-shirts, caps, bags for basic level; stepwise increasing to more valuable support for higher sales performance. Unlike for stove producers, distributors are not requested to contribute to these (mainly low-cost) performance-based reward with exception of the tuktuk tricycles offered to top performers, for which a 20 % cost-contribution is requested.
- **Tailormade support** such as branding of materials and local media spots, as well as the offer of a tuktuk tricycle should be used as a reward for best performing distributors.

The offer of technical and entrepreneurship training for LME can be institutionalised by conducting trainings of trainers at formal training institutions (youth polytechnics and Vocational Training Centres (VTC) who will offer these trainings in the future at local affordable fees. Adoption of training curriculum by

public training institutions requires approvals from regulatory bodies which may take several months or even years and respective follow-up needs to be included in the activity planning.



3.3 Performance-based support

To maximise the market transformation impact of the Professionalisation Approach, the support should be focussed on producers and distributors who show a significant motivation and potential to develop their business activities. Safeguards for a performance-oriented support of stove producers are built into the Professionalisation Approach at several levels:

During **application stage**, the performance track-record of the producer is a key criterion to determine the respective support category and the individual ranking of the application to be included into the support scheme. For this ranking, verified data for at least six months should be available. If such data is not available or not reliable and cannot be produced during a pilot phase, optional milestones (see 3.) should be used to split support at least into two disbursements.

For **implementation**, a cost contribution of 20 % is requested as advance payment from the producers (see above for exceptions on workshop construction and pick-up trucks). As this represents a significant amount, producers need to show their commitment to invest own funds into their business. In the case, producers struggle to provide their cost contribution, disbursement might be split into two steps.

1. Safety equipment has been provided without the requirement of a cost contribution to ensure that financial constraints do not limit the improvement of safety practices for which also technical training is provided. Once safety procedures have

been established and the production is professionalised and growing in scale, it is expected that producers are willing to invest in maintenance and replacement of such equipment.

2. For distributors, a cost contribution of 20 % is only requested for the tuktuk tricycle.

All producers and distributors need also to confirm with their signature in a handover-document that they cannot and will not sell the materials of the kit for at least two years. Producers or distributors who comply right from the start with their milestones for the 2nd or 3rd step of disbursement can directly benefit from multiple simultaneous disbursements provided, in the case of producers, they are able to contribute the required advance payment on their cost contribution.

Optional – 2-step disbursement of support packages

In the case no reliable data on sales performance is available, or to further increase the performance-based character of the support, a 2-step disbursement might be considered with the 2nd disbursement being made upon achievement of specific sales milestones to be defined for each producer and distributor type (see table 5 below). The rationale for two disbursement steps is that the value of the material support provided e.g., to a single intermediate producer can accumulate beyond 50,000 EUR. To ensure that such an investment is only made for highly motivated, capable and in the end successful producers, it is not enough to define milestones



Three members of the Gassama womens cooperative are preparing the clay mixture for the ceramic inlays of the ICS in Koalack, Senegal.

on the use and application of the support such as a business plan developed, staff employed and trained, or even number of ICS produced. The only results that fully captures the commercial success of a producer or distributor is the number of ICS commercially sold over an extended period of time.

The advantage of two disbursement steps is two-fold:

- 1.** For the project, it reduces the risk of losing assets to non-performing producers or distributors. Whoever does not increase production according to expectation based on receiving one tranche of the kit is not eligible to receiving the next step.
- 2.** For the producer, the step-wise approach facilitates a reduction of the investment barrier, as also the own cost contribution is split into several smaller amounts for each disbursement.

The disadvantages and risks of two disbursement steps are:

- 1.** Increased cost of logistics (storage and transport of materials)
- 2.** The need for specific materials and machinery might differ for each producer, but individualised sequencing would even further increase cost of logistics.
- 3.** Slower implementation possibly limiting the manageable number of support windows (see below)
- 4.** Delayed impacts as producers cannot make full use from the support right from the start.

Against this background, the decision on splitting disbursement into two steps should be based on a careful consideration of the specific circumstances of the intervention.

If disbursement is divided into 2 steps, the milestones need to be adapted to each category of stove producers and distributors. Table 5 below presents the milestones planned for the Kenya and Senegal pilots. The content of the specific tranches is defined in [chapter 4.3](#).

Table 3: Exemplary sales milestones for each producer and distributor category based on the Kenya and Senegal pilots

| Sales milestone (Average monthly ICS sales over 6 months period) | Artisanal ICS producers (30-150 ICS/month) | Intermediate ICS producers (< 1000 ICS/month) | ICS wholesalers / retailers | ICS Last-mile entrepreneurs |
|--|--|---|--------------------------------|--------------------------------|
| 1 st disbursement | 30 | 150 | 50 | 15 |
| 2 nd disbursement | 100 | 500 | 300 | 40 |

To receive a disbursement of their support packages, producers and distributors have to demonstrate reaching the threshold of their respective milestone based on average monthly sales records over the

past 6-month period. For this also seasonality as well as religious or other festivities should be considered since these can have a major effect on sales numbers.

Implementation of a stepwise approach in light of contextual challenges

Due to the effects of the Covid-19 pandemic, the inception phase, in particular the stakeholder consultations and subsidiary agreements, took longer than originally planned. Further delays occurred due to challenges in the international procurement of materials and machines, which have not been available in the required sequence of the disbursement tranches. This resulted in significant delays in the disbursement of the ICS professionalisation kits. These delays required a greater flexibility for the disbursement of subsequent tranches.

To speed up implementation and resulting market impacts, support kits have been delivered independent of the milestones for average monthly sales. Whenever items were ready for delivery and the own contribution of the producer was secured, the items were delivered. This flexibilization was possible as especially the selection of producers in the first support window (see [chapter 4.2](#)) had been based on a track-record of 24 months of sales and even earlier promotion activities. Therefore, the risk of non-performing producers was manageable. In case such track-record does not exist, it is recommended to split support at least into two disbursements even in case of external challenges and delays.

The intermediate professionalisation kit includes optional top-ups. These top-ups are of high value and highly desired by the producers. It might therefore be considered to link their disbursement not only to the prior advance payment for the professionalisation base kit, but also to the achievement of performance-based milestones for the 2nd disbursement. Such a condition might increase motivation of producers to achieve performance results. Furthermore, the advanced machinery as well as tools are a key element to increase production while a pick-up truck might enable to increase coverage of the distribution network thus enabling the producer to reach the envisaged production level. Advantages

and disadvantages of delaying such strategic investments by another 6-9 months should therefore be carefully weighted.

Linking optional top-ups to the second disbursement step is easy for the advanced machinery and the pick-up truck, as the procurement is straight forward and only dependent on the payment of the cost contribution by the intermediate producer.

The construction or extension of a proper workshop building is a far more complex activity and the required permits, procurement, and construction will take considerable time. It is therefore recom-



Ousmane Thiam, an ICS fabricator in Senegal, is shaping the cut metal sheets into an ICS shell in Dakar, Senegal

mended to start the planning process directly with the 1st disbursement and to require that producers need to secure land (by purchase, long-term lease, or other legal arrangement) in advance as their own contribution. Concerning the secured plot of land, a number of requirements need to be met:

- the land must be suitable (e.g., not flooded in the rainy season; soil condition allows for the construction of workshop; location allows production of stoves [e.g., noise, emissions]; there must be a permit for the construction of the workshop for this plot; accessible by a truck);
- the right to use the land for ICS production has to be secured at least for 5 years (e.g., by ownership, lease contract, allocation of user rights from local government etc.);
- the size of the land is sufficient for the planned construction of the workshop.

Piloting one workshop construction before the first application window

For the pilot projects in Kenya and Senegal it was decided to pilot one workshop construction on a site of an intermediate producer already during the preparation phase in order to gain experiences on possible challenges and to develop the specifics of the tender process. For the selection of this pilot, only eligible intermediate producers were considered who already possessed a suitable construction site (size, condition, usability for productive purposes). If different construction approaches are considered (e.g., based on transport containers versus local construction) both options might be tested and compared.

Sequenced funding windows

It is recommended to offer at least two if not even three application windows for the support. The underlying rationale is that the first application window usually gives an advantage to producers who already benefited from past support or have better access to information while other producers might not be able to comply with the first submission deadline or might not qualify for participation due to insufficiently documented sales. In other words, offering two or three application windows increase the equal access for all producers as well as provides access for producers that are more hesitant at the beginning. It also provides the opportunity to advanced artisanal producers to increase sales to the intermediate level and submit a respective proposal

for the 2nd window, or for advanced intermediate producers to participate in the business class category.

However, the combination of 2-3 application windows, as well as the optional two disbursements per window (based on intermediate monitoring of 6-monthes of sales) has implications for the required implementation period. The illustrative Gantt chart presented in table 6 below shows, that with a project duration of three years, a maximum of two application windows each with one disbursement is feasible, while three application windows with two disbursements each require a full five-year implementation timeframe. It needs to be taken into account that this scenario depends also on other factors like procurement timelines.

Table 4: Illustrative Gantt chart for staggered disbursement

| | | 1st year | | | | 2nd year | | | | 3rd year | | | | 4th year | | | | 5th year | | | |
|---|-------------------------------|----------|----|----|----|----------|----------|----|----|----------|----------|----|----|----------|----------|----|----|----------|----------|----|----|
| | | Q1 | Q2 | Q3 | Q4 | Q1 | Q2 | Q3 | Q4 | Q1 | Q2 | Q3 | Q4 | Q1 | Q2 | Q3 | Q4 | Q1 | Q2 | Q3 | Q4 |
| Project ste-up and preparation of support | | | | | | | | | | | | | | | | | | | | | |
| 1st Window | Call, selection & contracting | | | | | | | | | | | | | | | | | | | | |
| | Kit disbursement & trainings | | | | | | 1. Disb. | | | | 2. Disb. | | | | | | | | | | |
| | Monitoring company sales | | | | | | | | | | | | | | | | | | | | |
| 2nd Window | Call, selection & contracting | | | | | | | | | | | | | | | | | | | | |
| | Kit disbursement & trainings | | | | | | | | | | 1. Disb. | | | | 2. Disb. | | | | | | |
| | Monitoring company sales | | | | | | | | | | | | | | | | | | | | |
| 3rd Window | Call, selection & contracting | | | | | | | | | | | | | | | | | | | | |
| | Kit disbursement & trainings | | | | | | | | | | | | | | 1. Disb. | | | | 2. Disb. | | |
| | Monitoring company sales | | | | | | | | | | | | | | | | | | | | |



4 How to implement the Professionalisation Approach

Charity Njeri the founder of Charity Production Centre based in Muranga, Kenya is forming the clay for the ceramic body of the stove in the mold.

This chapter presents guidance on the **technical implementation** of the Professionalisation Approach. It includes elements for an operation manual with focus on the ICS supply chain development. Key implementation steps are the preparation of the standardised support packages (4.1), the competitive selection of producers and distributors (4.2), and the performance-based implementation of support activities (4.3).



4.1 Preparation of support packages

Building on the stakeholder consultations during project preparation (see [section 3.1](#)), implementation starts with a detailed needs assessment of the targeted stove producers and distributors which informs the compilation of the support packages. The needs assessment might build on desk-based reviews, but should at its core involve individual interviews or focus group discussions with a representative sample of stove producers and distributors at different degrees of professionalism. The needs assessment should cover both material needs and demand for technical and business trainings and informs the elaboration and standardisation of the offered support kits as well as of the technical and business training modules. Already at this stage it is important to manage expectations of producers and distributors by emphasising the competitive and performance-based approach of the programme.

The support packages for producers and distributors consists of professionalisation kits and accompanying technical and business training. For both elements, the key approach for the procurement of materials and services should be decided early on:

- If a larger number of stove producers and distributors are supported, the logistical effort for storage, handling, and delivery of a large number of materials should not be underestimated and **sub-contracting of procurement and delivery** to a professional service provider should be considered at an early stage.
- Early procurement of **framework contracts** with trainers or service providers can increase flexibility of implementation and ensures a fast start of activities once the training and coaching needs have been defined and the selection of beneficiaries ([chapter 4.2](#)) has been completed.

Support package for stove producers

The support package for stove producers comprises the handover of professionalisation kits accompanied by technical and business training as well as access to finance coaching as presented in [chapter 3.2](#).

Professionalisation kits

For the professionalisation kit, a generic list of items and their possible costs should be identified early during the needs assessment. As materials and tools required for the production of ICS are to a certain

extent independent from the target country, the list developed for the pilot projects in Kenya and Senegal can be used as orientation but must be adapted to the requirements of the supported stove designs and updated with local prices (see table 5 on the following page). The actual composition of the base kits, optional advanced machinery, and the quantities of items required, can be selected from this list in consultation with the beneficiaries and in consideration of a maximum cost threshold which also considers the willingness to pay 20 % of the kit's cost by the stove producers.

Cost and logistic effort of procurement are strongly influenced by the target countries' contexts. While in Kenya, materials could be locally procured, in Senegal many items required international procurement adding to the costs and most of all the time required for the procurement. To prevent implementation delays, the time for (international) procurement should therefore be considered at early stage of the implementation planning and procurement should start as early as feasible.

ICS production support in the Senegal pilot

Artisanal (family business) producers in Senegal all started from a similar baseline of assets. They have one or two set(s) of hand tools and no mechanical or electric machines for production. They operate at their homes outside their houses, on communal land (roadside) or under a shelter on a market place. They only produce on demand (and payment in advance) and sell at their product only to the end client at their workshop. The investments need to lift them to professional level are rather uniform: a workshop structure, better hand tools, (mechanical) machines, workshop furniture, safety gear, transportation and communication equipment. Based on more than 5 years of experiences of EnDev Senegal, standardised support packages consisting of a "professionalization kit" and related technical and business training for artisanal ICS producer have been designed in 3 sizes from 7,000 to 9,500 EUR. As producers had to contribute 20 % of the cost, most artisanal producers only selected the basic kit. Once the support package helped to increase the average monthly sales from baseline (minimum 40) to 150 ICS per month the entrepreneurs can apply as intermediate producers in a later support window, but in this case, they can only receive the additional materials and trainings not already included in the artisanal support package.

The 25 intermediate producers active in Senegal in 2019, on the other hand, had more diverse baseline assets. Some of them used more machines than others. Some of them had workshop structures while others still worked open air. It was initially assumed that providing a standard "professionalization kit" would lead to inefficiencies. Accordingly, the producers were assisted by a business consultant to develop a reliable investment plan suited for their individual situation which also included the desired items for the professionalisation kits. Results suggest that it can be feasible also for intermediate producers to offer standardised kits if their current production level and respective staff size is taken into account by offering differently sized kits. The resulting cost of the kits has been in the range of 14,000 to 16,000 EUR.

Table 5: Generic list of possible items for the professionalisation kits⁵

| Category | Cost estimate (small/large) in EUR | Category | Cost estimate (small/large) in EUR |
|--|------------------------------------|--|------------------------------------|
| Hand tools | | Workshop Infrastructure | |
| Hammer, chisel, punch, saw, engravers, number and letter punch sets, pliers, hand shears (for metal straight/left/right), riveter, anvil, rail, bench vice, surface plates, dividers and scribes, square, callipers, tape, spirit level, tapered tubes, mallets, sieves, spade, hoe, metal basin, clamps, screw-driver (set), spanner (set), toolbox, grease gun, steel rule, wire brush (welding), chip hammer (welding), files (set) | set of items 600/1,000 | small kiln with capacity of 120 stoves | 500/1,000 |
| | | medium kiln – capacity of 300 stoves – either constructed (half orange) or fabricated | 1,500/1,700 |
| | | Large kiln with capacity of up to 1000 stoves either constructed (half orange) or fabricated | 2,000/3,000 |
| Manual machines | | Work benches (and seats) | 200/300 |
| Roller | 200/450 | Work tables-metal | 200/300 |
| Sheet Metal Plain Cutter | 100/500 | Ladder-metal | 50/100 |
| Sheet Metal Shear Cutter (e.g., for curves) | 200/400 | Racks/Shelving | 250/350 |
| Jenny | 160/500 | Water Tank | 250/400 |
| Metal Clamps | 50/70 | Water pump (including delivery piping & fitting) | 150/300 |
| Spray gun | 40/50 | Ventilator | 100/150 |
| Mixer | 100/150 | Workshop lighting system (e.g., portable lamps) | 50/150 |
| Kneading machine | 200/300 | Used Container | 2,000/3,000 |
| Moulds | 150/200 | Modification of container (door, window, hangar roof/shade etc.) | 1,000/2,000 |
| Drill | 30/50 | Electricity supply | |
| Tap and die set (for threading) | 100/300 | Grid connection and inhouse wiring | 250/500 |
| Moulding machine | 200/500 | Solar-PV system | 2,000/5,000 |
| Sheet metal press | 150/300 | Transportation | |
| Chain block/hoists | 100/300 | Wheel barrow | 40/60 |
| Electric/motorized machines | | Hand Cart | 130/150 |
| Mixer | 1,290/2,000 | Trolley | 50/100 |
| Kneading machine | 1,790/2,150 | Platform/ pallet truck | 100/400 |
| Pulveriser/grinder | 800/1,300 | Tuktuk tricycle | 1,100/5,000 |
| Potters mill | 100/200 | Communication | |
| Jenny | 2,000/4,500 | Smart phone | 100/250 |
| Rolling machine | 1,700/2,500 | Laptop/desktop computer | 300/600 |
| Cutting/shear machine | 200/400 | Safety equipment | |
| Drill (corded or cordless percussion, drill bit set) | 200/500 | First aid kit | 20/100 |
| Vertical fixed drill (for heavy duty drilling) | 500/1,500 | Fire extinguisher | 20/100 |

⁵ The list is based on the needs assessments conducted in 2019 for the pilot countries Kenya and Senegal, cost estimates are based on local prices at that time.

| Category | Cost estimate (small/large) in EUR | Category | Cost estimate (small/large) in EUR |
|--|------------------------------------|---------------------------------|------------------------------------|
| Spray gun 800ml | 100/150 | Helmet | 15/30 |
| Compressor with spray painting equipment | 300/700 | Gloves-welding | 15/30 |
| Welding machine | 400/600 | Gloves-metal work | 15/30 |
| Extruder | 1,300/2,500 | Goggles-spraying | 20/40 |
| Jigger-Jolly | 250/350 | Goggles-welding | 20/40 |
| Angular grinder (incl. grinding stone) | 250/350 | Ear muffers | 20/40 |
| Bench grinder (incl. grinding stone) | 150/350 | Masks-dust | 10/20 |
| Mould | 300/1,000 | Masks-spraying | 20/40 |
| Sander/polisher | 100/200 | Heavy duty shoes (safety shoes) | 40/100 |
| Jig saw (including blades) | 100/300 | Overalls- welding | 30/50 |
| Band saw (metal cutting) | 300/500 | Overalls- general duty | 30/50 |

Technical and business training modules

It is recommended to early procure technical and business consultants and coaches with flexible framework contracts covering the following range of assignments to be detailed out later on:

- based on the results of the needs assessment and the items selected for the professionalisation, standardised technical and business training packages need to be developed including training curriculum and implementation schedules;
- evaluation of applications of intermediate and business class producers;
- Implementation of technical and business trainings.

Access to finance facilitation

To improve access to finance, training, coaching and facilitation are provided. The technical assistance should be designed in partnership with local financial institutions, who in parallel will be educated about ICS sector specifics, including the nature, type and value of production assets, and will be supported to design new financial products, which better suit the ICS sector. Early procurement of framework contracts with trainers or service providers increases flexibility of implementation and ensure a fast start of activities once the selection of beneficiaries ([chapter 4.2](#)) is completed.



Moussa Ba is welding the main body casing of the ICS metal cladding in Saint Luis, Senegal

Support package for stove distributors

Beside the support provided to stove producers to build their individual distribution networks, the support package for stove distributors comprises the handover of distribution kits accompanied by technical and business training as presented in Chapter 3.2.

Distribution kit

For the distribution kit too, a generic list of items has been established during the needs assessment for Kenya and Senegal and can be used and adapted (see table 6 below). The actual composition of the distribution kits and the quantities of items required can be selected from this list in consultation with the beneficiaries.

Table 6: Possible items for the distribution kit⁶

| Category | Cost estimate (small/large) in EUR |
|---|------------------------------------|
| Generic promotion materials | |
| Leaflets, brochures, posters, pamphlets, pens (100-200 pieces each) | 80-160 |
| Bags, T-shirts, caps, aprons, umbrellas (30-60 pieces each) | 420-700 |
| Professional clothing | |
| Overalls, dustcoats, reflector jackets (5-10 pieces each) | 100-200 |
| Professional display | |
| Stove models (set) | 140 |
| Parasol, vinyl banners, display stands, signages (1-2 pieces each) | 660-1,300 |
| Increased outreach | |
| Tuktuk tricycle | 1,100-5,000 |

In general, distribution materials are less sophisticated (compared to tools and machines for stove production) and national procurement should be feasible in most cases (however, the large number of items will require even large vendors to reorder). While the number and volume of materials per distributor is smaller compared to the professionalisation kit, the total number of LMEs supported might be significantly higher resulting in a similar logistical challenge for storage, handling, and delivery. Therefore, also in this case, sub-contracting of these logistical tasks might be considered at an early stage.

Technical and business training modules

Based on the results of the needs assessment as well as considering the items selected for the distribution kit, standardised basic technical and business training packages need to be developed in terms of training curriculum or content and respective ToR to contract trainers.

In the Kenya and Senegal pilots, both technical (on characteristic of different stove types, ceramic stove installation) and entrepreneurship trainings were offered for new and existing LMEs, with specific modules targeting women LMEs.

⁶ The list is indicative only and based on local prices in Kenya in 2022.



Modou Gamou is bending the metal for the metal cladding of the main body of the ICS in Sokone Kaolack, Senegal

4.2 Selection of beneficiaries

The professionalisation approach is focussing on the ICS supply chain and main beneficiaries of the support activities are ICS producers and ICS distributors. As the approach involves the hand-out of significant in-kind subsidies (professionalisation and distribution kits), the selection of beneficiaries must be organised in a most transparent and inclusive way, while applying and communicating competitive and performance-based selection criteria.

Selection of ICS producers

The focus of the professionalisation approach is to promote strong, capable and motivated ICS producers to higher levels of productivity and sales. The support kits and training shall therefore be allocated to producers with a good track record and high business potential. To keep the selection process efficient, a number of eligibility criteria should be clearly communicated with the public call for

proposal. Eligibility criteria should be relevant and easy to access. They should ensure that the limited amount of support kits and measures result in the strongest market impact by reducing the number of underperforming producers. Recommended criteria are:

1. Minimum (and maximum) average monthly sales of ICS over a 6-month reference period (per category),
2. Quality and thermal efficiency of ICS (based on CCT or the new ISO 19867-1&3 if feasible),
3. Membership in a sector association can be a useful requirement depending on country context in terms of existence and structural capabilities of such associations).

Additional eligibility criteria might be selected depending on programme objectives and requirements.

Eligibility criteria used in the Kenya and Senegal pilot projects:

Average monthly sales of ICS over reference period:

The threshold was set at 30 for artisanal producers and 100 ICS for intermediate producers, business-class producers with more than 1,000 stoves per month did not receive any material support kits but received business training and coaching.

Quality of ICS:

A sample of stoves produced has been tested via a controlled cooking test (CCT) to compare the fuel saving of the new stove with the baseline technology. Firewood stoves must save 40 %, the charcoal stoves 30 % of fuel compared to baseline. During implementation, product quality was a key subject of the technical training provided on improved tools, machines and production processes and compliance was checked by quarterly inspection visits over the implementation period.

Membership in a sector association:

Membership in sector associations or, e.g., in cases where no sector specific association exists, with the chamber of crafts has been required. On the one hand, membership improves sector organisation and development, on the other hand sector association or chamber of crafts have been implementation partners for the collection of the producers 20 % contribution to the value of the professionalisation kit.

(Non-)Affiliation to other programs funded by ODA or carbon markets

As the pilot projects in Kenya and Senegal were co-financed by the GCF, it was required that the ICS produced (and their GHG emission reduction effect) are exclusively reported to the EnDev/GCF project. In the case that a stove producer participating in the programme sells a limited number of ICS to a carbon project, these stoves must be reported to the EnDev/GCF project and are not reported under the project's results figures and mitigation impact.

The call for proposal for each funding window should be presented in regional information meetings. Producers should be informed about these meetings through government services, associations, media or any other channel found suitable to assure adequate access to the information for the relevant target group. During the meeting, the participants should be informed about:

- about the ICS market scaling programme and the support packages offered;
- about the conditions under which the support is available;
- what producers are eligible and what the next steps are for those who are eligible;

- that not all eligible producers will receive a kit (competitive selection);
- if and when there will be a subsequent application windows, and what an ICS producer who did not qualify for the first window must do in order to be eligible for a subsequent window;
- the benefits of the program for all producers (even those that will not receive a kit).

During these meetings producers learn how they can express their interest for receiving the support and which information they need to provide to the project in order to be assessed for selection. In case there are more applicants than kits available, the project should select best scoring producers.

ICS producers need to provide the following information in their Expression of Interest:

1. That he/she is interested to receive a professionalisation kit and accompanying trainings;
2. A documentation of her ICS sales over at least a six months period;
3. That he/she is aware and will be capable of providing in advance her own contribution of 20 % for each disbursement step of the kit (amount will be mentioned in the template);
4. In case of the optional support offered to intermediate producers: the requested 'optional top-ups'.
5. That he/she will be using the assets provided by the kit to increase monthly ICS productions and sales; acknowledgement that assets provided cannot be sold for a minimum of 2 years
6. The type and models of ICS that he/she will be producing (incl. available quality certification);
7. The geographic area where he/she is intending to increase his/her ICS sales to;
8. That he/she will provide over the project period all necessary information for the monitoring and reporting.

For the **intermediate producers**, a technical expert and/or business specialist should visit the producers' workshops to evaluate their needs as expressed in their Expression of Interest and to verify the claimed level of monthly sales and if the intermediate producer is seriously interested to become a business class producer. The technical expert and/or business specialists will also advise on optional equipment and the extend and cost of required construction measures to improve the workshop premisses. In case that any applicant already fulfils the sales threshold for business-class producers, a business specialists should identify the needs for individual support to facilitate access to finance.

The evaluation of the expression of interest consists of two steps:

1. **Validation of eligibility criteria** (monthly sales, product quality and membership in sector associ-

ation) and in case of intermediate producers also involve the cross-check by the technical experts and/or business specialist. Expression of Interest that do not comply with eligibility criteria are rejected.

2. **Separate ranking of artisanal, intermediate, and business-class producers** based on sales figures and in the case of intermediate and business class producers based on the report of the visiting technical expert and/or business specialist. Additional ranking criteria might be applied to reflect specific project objectives such as regional targeting, gender or LNOB. However, any such modification should be considered with great care as it will interfere with the overall performance-oriented focus of the approach.

The gender approach of the Kenya component

During implementation, the Kenyan project team put a special emphasis on reaching out to women led stove producers and motivated them to participate in the performance-based support programme. Starting with the regional sensitization sessions, female owned/female managed ICS business were especially encouraged to attend. Once deemed eligible, specific training support was provided to female led/managed businesses on entrepreneurship/business management, financial literacy, and requirements of the finance sector for investment application. As a result, nearly 50 % of the artisanal producers participating in the programme are women led.

For example, one of them is Charity's business. Charity has been able to scale up her ICS business to producing 1,000 to 3,000 ceramic liners as well as stoves a month. Also, as a new business model she included the installation of the stoves within the household.

The selected producers will be offered to participate in the professionalisation activities and must sign an 'Expression of Intent' in which they confirm their ambition to use the professionalisation kit and accompanying trainings for the benefit of increasing their ICS production and sales. In the case of intermediate producers, they confirm their commitment to implement their investment plan and realize the targets for expanding their production and distribution network up to the performance milestone for the last disbursement step.

Selection of ICS distributors

Depending on the market assessment and the resulting intervention strategy, distribution support might exclusively focus on areas with so far weak supply chains or also target regions with established distribution networks to further boost sales. Considering the informality of LME, eligibility criteria are limited to a minimum monthly sales threshold for LME as well as for wholesalers/retailers documented for a six-month reference period. Sold stove types need to be eligible and be procured from

qualified producers. Sales claims and data of these producers can be used to crosscheck on sales claims of distributors.

For distributors, a less formal application process is recommended which uses regional information meetings to inform about the support offer as well as to collect the expression of interest for participation. ICS distributors need to provide the following information in their Expression of Interest:

1. That he/she is interested to receive a distribution kit and accompanying trainings;
2. A documentation of ICS sales over at least a six months period including name and contact details of their stove supplier;
3. An indication of type and models of ICS that he/she will be distributing;
4. The geographic area where he/she is intending to increase his/her ICS sales to;
5. That he/she will provide over the project period all necessary information for the monitoring and reporting.



4.3 Implementation of performance-based support

Once the selection of supported stove producers and distributors is done and contracts (expression of intent) are signed, a process will start for awarding and providing the support packages (kits and trainings) to the ICS beneficiaries.

For the implementation of performance-based support in two steps (see [chapter 3.3](#)) it is important to ensure a quick implementation of the first disbursement of kits and accompanying trainings. This will facilitate a swift start of the 6-month monitoring of sales performance required to release the second disbursement.

Procurement of the professionalisation and distribution kit should start as early as possible, based on the total number of applications received and even before the first application window is completed. In the case that not all producers qualify for support, kits might be used for subsequent windows.

Collecting the producers' contribution

As it is usually difficult for project implementers to collect and manage financial contributions. Two options for the advance payments of the producers' contributions were tested in the pilot implementation (see [table 7](#) below). Both options avoided that the implementing organisation has to directly handle the financial contributions of the producers.

Table 7: Options of procurement and of collecting producers' contributions

| Professionalisation kits | Option 1 | Option 2 |
|--------------------------|---|---|
| Procurement | 20 % of items bought by ICS producers, 80 % of items bought by the project | 100 % of items bought by EnDev/GCF project |
| Own contribution | Verification of items bought by producer before handing over of items procured by the EnDev/GCF project | Cash payment into the account of the producer's association to be verified before handing over of items |
| Handover of items | (a) directly to producer, (b) indirect through government entity | |

Managing financial contributions of the stove producers in the pilot project

In **Kenya**, not all participating producers were members of the Improved Stoves Association of Kenya (ISAK) which is an association of ICS entrepreneurs (producers, distributors, installers and marketers). Therefore, **Option 1** was tested. For each step of the professionalisation kit, the ICS producers had to procure a share of items of the kit locally themselves as agreed upon. These items should represent 20 % of the overall value of the respective tranche and represent the own contribution of the producer. In some cases, local materials might be considered (e.g., kiln construction) and monetized based on the bill of quantities of construction plan multiplied by the local value of the material based on a quick market assessment. After confirmation of the quality, quantity and value of the purchased items, the project procures their 80 % cost share of the assets of the respective disbursement step. The items are handed over either directly to the ICS producer or indirectly through a government partner.

Option 2 was tested in **Senegal**: The project procured 100 % of the assets of the kit. However, before the kit (divided in disbursement step 1, 2, and 3) was availed to the ICS producer, he/she needed to pay the own contribution (for each of the 3 steps) into the account of his/her ICS producers association. After verification of the availability of funds, the assets of step 1,2, or 3 were availed to the producer. The funds that the producer pays into the account of the association remain with the association as an institutional subsidy grant and are used to pay for investments into developing the ICS sector, e.g., marketing events, or to cover operational costs.

Handover of the professionalisation kit

Items can be handed over to the producer or distributor either (a) directly by the project staff/ a contracted logistic partner or (b) indirectly through a government partner of the project. However, in both cases, the following aspects need to be assured:

- Validation and documentation of delivery based on a standard hand-over document either signed

by producers/distributors or by the partner institution; in the latter case followed by a handover from the partner institution to the final recipient as beneficiary of the project.

- In case of a government partner a mutual agreement needs to be signed, which includes a paragraph regarding the handover of assets to stove producers.
- An inventory of all equipment handed over to beneficiaries needs to be maintained.

Risk mitigation

The provision of professionalization and distribution kits on a largely grant basis entails the risk that some

kits may not be used to the full benefit. Several types of risks should be considered and as far as possible mitigated, as presented in table 8 below.

Table 8: Exemplary risk mitigation table based on pilot experiences

| Type of risk | Gravity of the risk | Likelihood of the risk | Mitigation measures |
|--|---|--|--|
| Less than expected producers apply and/or qualify for the professionalisation support or qualified producers do not pay in time/at all their own contribution | Cumulative sales may not increase as projected unless the fewer large producers grow stronger than anticipated. | Small if a robust base of ICS producer already exists in the targeted market and unless major economic shocks appear. | Preventive: Conduct comprehensive stakeholder consultations and needs assessment of stove producers. Reactive: Analyse and consider reasons for the second application window. |
| Procurement – local/international and delays associated as well as handover of assets delays | Initial delays will reduce the time for subsequent disbursement steps and application windows. | Relevant in case of international procurement and complex procurement regulation of the implementer. | Preventive: Consider contracting of an experienced logistic partner. Start procurement directly after the needs assessment is completed and the kits are compiled. |
| Tools and assets of the professionalisation kits are used for other purposes | The productivity will not increase to the full extent in case there is unserved demand. This has not been much observed in the past implementation. Larger producers are more specialized on ICS and do not accept other work. Not very likely to appear in large numbers. | | Preventive: Recipient of kit must sign charter/contract in which he/she commits to use materials for ICS production; Reactive: The provision of the assets of the next step is depending on the production level and the proper handling of the assets. If the regulations of the charter/contract are violated, the project may decide to refuse the next tranche. |
| Assets are sold to someone else | No further growth of production. | This was only observed in very few cases where the producer died or emigrated to another country. | Preventive: Signing of the charter/contract; Reactive: If the regulations of the charter/contract are violated, the project may decide to stop further support. |
| Companies provide falsified information / sales data | Resources might be disbursed to underqualified producers with low productivity increase. | Most relevant for artisanal producers during application stage if no previous support history and monitoring data exist. | Preventive: Plausibility checks, clear communication that future sales will be closely monitored. Reactive: Exclude producers from any further support. |
| Some ICS producers may not perform well enough to trigger the second or third disbursement | Producers will not develop as strong as anticipated according to the simulation of market development | External events may undermine initial growth assumptions. | Preventive: Selection of the most active and strong ICS producers, create awareness and demand for ICS, facilitate distribution chain development. Reactive: Provision of additional material, advice or training; reallocation of funds for further assets for professionalisation to other producers. |
| ICS producers die | Often this means the end of the enterprise | It did happen in rare cases | None |

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