

# **ENERGY EFFICIENT COOKING STOVES AS A CONTRIBUTION TO THE SUSTAINABLE USE OF FUEL WOOD IN PASTORALIST SOCIETIES IN ETHIOPIA: CHALLENGES, OPPORTUNITIES AND LIMITATIONS**

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The natural environment, consisting of an intact ecosystem and its services, is crucial for human well-being and the sustainable development (socially, ecologically, and economically) for present and future generations (Brundtland Report 1987; Agenda 21). However, humans have changed ecosystems more rapidly in the past 50 years than in any comparable period of time in human history (Millennium Ecosystem Assessment, 2005). Conservation mechanisms using the knowledge (incl. indigenous knowledge), innovation and education to build a culture of safety and resilience at all levels are often not yet part of national priorities, in spite of their recognition as contributing to sustainable development. Globally, almost 3 billion people rely on biomass (wood, charcoal, crop residues, and dung) and charcoal as their primary source of domestic energy. Exposure to indoor air pollution from the combustion of solid fuels is thus an important cause of disease and mortality, particularly in developing countries such as sub-Saharan countries. The aim of the present study is to assess opportunities and limitations in supporting pastoralist societies in Ethiopia to use energy efficient cook stoves to meet their daily energy needs for cooking in a most sustainable way. Complex factors contributing to fuel scarcity in arid and semi-arid lowlands (ASAL), the traditional use of natural resources; behavioral adaptations to a changing environment; coping strategies, gender related responsibilities and opportunities to strengthen the position of women are also discussed. The study attempts to analyze strategies to convince pastoralist men and women to ease daily subsistence activities (e.g. fuel wood collection) and to contribute to a sustainable rangeland management by reducing biomass consumption. In Ethiopia household biomass combustion using energy inefficient traditional cook stoves (e.g. three-stone-fires) represents an underestimated health threat and a public health challenge, which is responsible for roughly 5% of the Disease-Adjusted Life Years (DALYs) for the entire country, and hence, a severe burden for the environment through the overuse of the ecosystems. The Government of Ethiopia is committed to reduce greenhouse gases through a national program of fuel efficient cook stoves that offers various entry points, provided cook stoves meet the required standards (e.g. low cost, good transportability, weight and energy efficiency) for a sustained introduction (using the Berkeley Darfur Stove® as a current gold standard). Entry points to motivate pastoralist households include: (i) involvement (for subsequent dissemination) of traditional decision making bodies, (ii) a direct involvement (targeting) of pastoralist women with a customary role in natural resource value chains, (iii) the national health system, and (iv) incentives for the private sector to produce and market energy efficient cook stoves. This may positively influence traditionally defined roles and responsibilities of pastoralist men and, particularly women. However, the impact of a successful introduction of novel household technology on gender relations and on their traditional decision making processes remain open key questions that require careful monitoring. Scaling up the use of energy efficient cook stoves in rural Ethiopia will not only reduce potentially harmful emissions, it will also offer significant additional benefits with respect to the sustainable management of the environment and the economic development of households, and thus, may improve social conditions; create new jobs; assure enhanced safety, and improve health. To achieve these goals, substantial changes in the behavior of the population involved will be urgently required, with strong emphasis on reducing gender imbalance. The use of improved cook stoves helps to address at least seven of the ten Millennium Development Goals (MDGs) of the United Nations and contributes to the human well-being for present and future generations. To secure the benefits of the introduction also for a sustainable use of the environment, educational and awareness training needs to complement the new technology initiatives.