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Increasing the sustainability of household cooking in developing countries: Policy implications

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ABSTRACT

Although 40% of the global population relies on traditional biomass use, mainly firewood and charcoal, for cooking, traditional biomass has received very little attention in the current biomass debate, because of its considered primitive and unsustainable nature. In this review, we discuss how the sustainability of household cooking in developing countries can be improved.

Indoor air pollution due to incomplete combustion of traditional biomass causes the death of 1.45 million people every year, mainly of women and children, who also carry the heavy burden of fuelwood collection. In addition, charcoal production and combustion is responsible for very high greenhouse gas emissions per unit of energy. On the other hand, fuelwood production and trade is of vital importance for local economies and serves as safety net for the poorest people. Moreover, fuelwood collection is not a driver of deforestation and global fuelwood shortage will not occur, despite local problems of fuelwood provision.

There are two distinct policy alternatives to increase the sustainability of cooking in developing countries. The first option is to climb the energy ladder and to switch from solid fuels to fossil fuels (LPG or kerosene), biogas or electricity. As this largely avoids the severe health damages of traditional biomass use, this option is considered the most desirable by numerous countries and by international organizations. However, as most developing countries are far away from meeting the necessary requirements, related to infrastructure, economics and local culture, expecting a large-scale switch to liquid fuels or electricity is unrealistic.

In that case, the second policy option, increasing the sustainability of the current traditional biomass system, must be considered. This can be realized by an integrated approach, in which national and regional fuelwood policies are adapted, improved systems for charcoal production are implied and improved stoves, in combination with chimneys, are distributed.

Contents

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1. Introduction

In 2007, 1031 Mtoe (Million tons of oil equivalent) or 12.9% of the total energy consumption was derived from biomass [1], comparable to the amount of energy consumption from electricity or gas [2]. In contrast to public perception, only 3% of the biomass consumption came from liquid biofuels in the transport sector. Traditional biomass use for cooking and heating accounted for 74% of the total biomass energy consumption and was more than 22 times as important as liquid biofuels.[1] Most scenarios say that at least until 2030, traditional biomass use will remain more important in terms of energy consumption than "modern" biomass use in the industrial and transport sectors [4].

Nevertheless, traditional biomass use has received remarkably little attention in the current biofuel debate, for it is considered unsustainable and primitive [5]. This attitude ignores the reality that traditional biomass use is and will remain extremely important for the global energy management and in particular for the poorest people. Hence, increasing the sustainability of traditional biomass use could have a tremendous effect on the sustainability of the global energy consumption.

In this paper, we will focus on policy interventions to increase the sustainability of wood-based traditional biomass use, with an emphasis on wood, the dominant fuel for traditional biomass use, in developing countries.

2. Historical overview: fuelwood crisis, re-appraisal and current policies

2.1. 1970s – Mid 1980s: fuelwood crisis

It wasn't until the mid-1970s that the total amount of fuelwood consumed for traditional biomass in developing countries was estimated. This lead to a first appraisal of the important socio-economic role of traditional biomass use [6]. In addition, future projections of fuelwood consumption were made, though based on inelastic models incorporating future population and assuming constant future fuelwood demand per person [5,7]. These projections showed that future fuelwood requirements were much larger than the annual regrowth in forests, which fuelled the widely accepted idea that fuelwood collection was a major cause of deforestation [8]. It was projected that by 2000, 2.4 billion people would suffer from a lack of fuelwood [9]. As this "fuelwood gap" was expected to cause an "other energy crisis" [6] with large socio-economic consequences for the poorest people, the international community responded with large development programs. These programs consisted of a large number of incentives to bridge the fuelwood gap, either by increasing the fuelwood production or by increasing the efficiency of fuelwood conversion. This last aspect was obtained by introducing improved cooking stoves and improved charcoal kilns and by replacing solid fuels with liquid fuels such as LPG and kerosene [10]. The emphasis of the programs was on fuelwood provision, which was mainly done by establishing government-controlled woodlots [8].

2.2. A reappraisal of the fuelwood crisis

Although based on good intentions, it became clear in the mid-1980s that the large majority of the development programs had failed. Even in urban regions, people did not switch massively to improved stoves or to liquid fuels [8]. Yet, the expected fuelwood gap was not observed [3,11–13]. It became clear that fuelwood is not a major driver of deforestation, partly because fuelwood is collected mostly outside forests. This gradually led to a better understanding of the fuelwood issue and to a reappraisal of the fuelwood crisis.

Due to huge shifts in international politics, in combination with the absence of the fuelwood gap and the limited success of the fuelwood programs, the attention of the international community for traditional biomass use gradually imploded [14]. In the 1990s and 2000s, the number of development programs was cut

[1] Traditional biomass use was estimated as 765 Mtoe, based on the available number of 2002 [2] and taking the common assuming that this has remained roughly the same in the years afterwards [3].