



Rural energy planning remains out-of-step with contemporary paradigms of energy access and development



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ABSTRACT

Billions of people around the world remain without access to modern energy services, the majority of whom live in rural locations. To support the deployment of these critical services, energy planners must consider complex interdisciplinary factors in the process of evaluating and deciding upon locally appropriate energy solutions. A key mechanism for navigating such complexity is to engage relevant local stakeholders in the process. In this study, we apply a systematic review to analyse process-oriented energy planning literature published over the last 35 years to explore the extent that past and present practices reflect current paradigms on energy access and development. The results indicate that the typical approach to evaluate appropriate energy solutions is siloed, disciplined in focus and non participatory. This paper highlights the need for a greater dialogue on participatory practice in the energy agenda to bring closer alignment with contemporary development thinking, and introduces an analytical framework as a way to reflect on this.

1. Introduction

The aim of this work is to determine the extent that rural energy planning in both developing and advanced economies is informed by contemporary paradigms of energy access and development. Two specific objectives are defined. First, to determine to what level human centred criteria are considered in the planning process of rural development, and second, to determine the level and type of participatory process engaged by rural energy planners.

This study is driven by an appreciation that current theory is not always reflected in common practice. Evidence to support this suggestion is presented herein. Unless significant effort is made to translate theory into practice, changing paradigms specifically regarding participation will remain largely academic with minimal real world impact. As a result, the status quo of excluding the energy impoverished from the planning process, whether intentional or otherwise, may well persist.

In 2012, 1.1 billion people remained without access to electricity, while 2.9 billion people continued to rely upon harmful fuels such as solid biomass and animal dung as their primary cooking fuel [1].¹ An overwhelming majority of the energy impoverished live in rural areas – representing 78% and 85% of the population who lack access to

electricity and clean cooking facilities, respectively [2].

Progress to address global inequality between urban and rural modern energy use continues to lag dramatically behind international ambitions [1]. This is despite recognition that energy plays an important role in the progression of human development and the alleviation of poverty [3–8]. The launch of the United Nation's Sustainable Energy for All (SE4All) initiative in 2012 aimed to focus political attention and mobilise action towards achieving universal access to modern energy services by 2030. The UN General Assembly declared 2014 the beginning of the 'Decade of Sustainable Energy for All', symbolising heightened momentum and the call for a coherent, integrated approach to energy issues and synergy across the global energy agenda [9].

However, these ambitious global targets will not be easily achieved. Projections by the International Energy Agency (IEA) in 2012 indicate that despite reducing the fraction of those without access to electricity by 20%, close to 1 billion people will remain without access in 2030 (Fig. 1) [10]. Similarly, projections also indicate that around 2.6 billion people, a little more than 30% of the global population, will still remain without access to modern cooking fuels in 2030. This represents a 25% improvement in relative terms, taking into account population growth and urban migration over the period. These projections are based on

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¹ The authors acknowledge the shortcomings of reporting energy access based on the binary definition of having access or not, and support the movement toward a multi-tier measurement framework that captures an affordable, reliable and meaningful level of energy access.

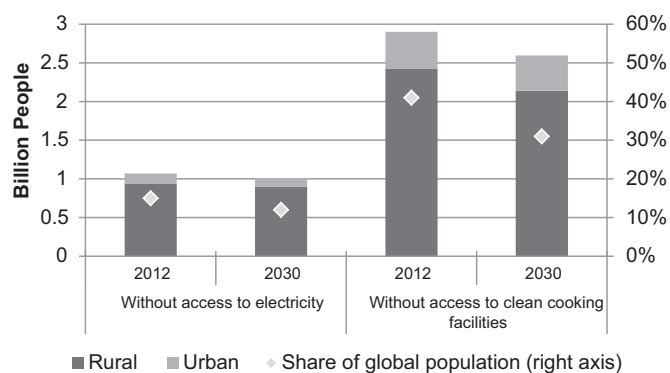


Fig. 1. Number and global proportion of people without access to electricity and clean cooking facilities in urban and rural areas, 2012 data and 2030 projections.

Source: Based on [1] and projections presented in [10].

the IEA's central 'New Policies Scenario', which accounts for existing policies in addition to the implementation of new commitments made by governments.

This global agenda to accelerate the provision of energy access has driven a desire to streamline and standardise the energy planning process [11]. However, contemporary literature suggests that to effect a sustainable change, this standardised process must account for localised conditions, uncertainty and the social and cultural complexity that this challenge demands [12–15]. For rural energy planners in particular, the complexity and uncertainty inherent in the energy supply challenge has never been greater. Rapid change in energy technologies and costs, population growth trends in low income economies coupled with mounting pressure to navigate delicate trade-offs between environmental, social and economic objectives (climate change perhaps the most obvious example here), are just some of the emerging concerns adding to the complexity of the energy planning challenge. Despite these calls for a greater emphasis on human factors dealing with localised social and political context, social science disciplines and methods that could help to inform this agenda typically remains under-represented in the broader field of energy research [16].

In part to overcome such local complexity, participatory approaches have become mainstream in development projects over the past decades for practitioners and donor organisations. The advantages (and critiques) of a participatory approach relative to a centralised, hierarchical process to decision making and planning in complex environments have been discussed extensively in the literature (see for example, [17–19] and [20]). Recognising the complex nature of the challenge and the importance of stakeholder participation are two concepts firmly embedded in the new paradigm of energy access and development. But to what extent does this contemporary thinking on energy access translate to rural energy planning practice? Here, we provide a critical analysis of the past and present state of rural energy planning practice by means of a systematic review of published literature between 1979, the earliest cited article, and 2016. We introduce an analytical framework as a tool to achieve this analysis, through a lens of participation. We also map patterns and trends of energy planning processes over time, to determine whether these trends have kept pace with changing paradigms related to energy access and development.

2. Context

2.1. Participation in development

The participatory discourse has developed on the assumption that through an inclusive process of decision making and the engagement of stakeholders, a sense of ownership and empowerment can be achieved leading to a more sustainable social impact. Development economists

have also argued that ownership and participation are key ingredients of a successful development strategy and explain why effective change cannot occur through external impositions [21]. As a result, an explosion of participatory methods, tools and frameworks have emerged in the literature since the 1980s [22]. Combined, these various methods give impetus to participatory reform of rural development practice, grounded in the recognition that local participation helps to bring closer alignment between development assistance and its intended beneficiaries [23]. From a governance perspective, the theory behind democratising the decision making process particularly in planning, emerged from recognising the limits of power and influence of governments to effect sustained change.

Considering participation in the context of development, 'participatory development' therefore is defined by the World Bank as "...a process through which stakeholders influence and share control over development initiatives, and the decisions and resources which affect them" [24]. In this article, we consider 'stakeholder' to refer to all groups, institutions or individuals who hold an interest in a project or programme, including both winners and losers, those ultimately affected (primary stakeholders) and intermediaries (secondary stakeholders).

The participatory discourse as it relates to development has not gone unchallenged, in many respects contributing to the continued refinement and expansion of methodologies. Mansuri and Rao [23], for example, argue the importance of recognising the difference between participation which is organic (endogenously driven social and ground level movements) and induced (extrinsically promoted and managed bureaucratically by governments and institutions), and how this transpires to differing outcomes. Other critiques of participatory processes relate to the concept of civil society failure as a third and often neglected dimension of common failures alongside market and government failure [23]. Civil society failure refers to the inability of society groups to self organise, hold government and business accountable and participate in activities that promote the collective benefit [23]. These criticisms remind participatory development advocates of the dangers of misaligned or poorly implemented processes and the need for critical reflection and improvement of practice and theory.

Broadly speaking, the principles underpinning participatory development and its family of methodologies reflect a paradigm shift commonplace in the development theory – away from the traditional industrial development model and towards a people centric and participatory mode of development [25].

2.2. Participation and energy access: three paradigms

In a similar fashion to distinct trends in development practice related to complexity and participation, we also observe distinct shifts in the approach toward energy access and development. One author [26] recently articulated three main paradigm shifts in energy access and development, which we adapt here in Table 1. As can be seen from the table, a distinction can be drawn between the donor-gift paradigm of the 1970s and 1980s and the market creation paradigm of the 1990s and early 2000s.

The former period of the 1970s and 1980s was characterised by policy and project instruments administered predominantly by single central agents such as governments or large multilateral donor organisations. This state-led approach typically favoured large scale energy systems with the objective of technology transfer under a donor-gift relationship. This paradigm saw little local participation in the technology driven, often centrally planned process [27].

Thailand's highly successful rural electrification program which began in the early 1970s represents an exception to the donor gift era, which is otherwise criticised for the inefficient and unsustainable provision of energy services. Much like many other energy development programmes in the era, Thailand's transition was driven by a central (often monopolistic) role of government and public utilities.

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