Bridging the energy access divide for sustainable development in South Asia: policies and prospects in Nepal

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Abstract: Bridging the energy access divide is critical for meeting Nepal's social and economic development objectives. Under the assumption that there are fertile opportunities for linking energy policy and market prospects, this paper explores the central question: 'to what extent is the current policy environment in Nepal conducive to the uptake of solar energy at the household level?' The paper makes use of an exploratory research approach to data analyses in order to address the research question. The findings reveal that the country's renewable energy market is still in its infancy. Although donor-driven subsidy policy has been successful in promoting the uptake of solar energy, exclusivity of subsidy mechanisms coupled with the lack of cross-sectoral policy harmony are hindering the uptake of solar energy. The paper ends with a discussion on the need for a market-centric impetus to facilitate a renewable energy sector in Nepal.

Keywords: donor agencies; energy policy; Leximancer; renewable energy market; South Asia; sustainable development; Nepal.

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1 Introduction

The ever-increasing demand for fossil fuel amidst declining supply, as well as consensus on the urgent need to find ways to adapt to the changing climate, has catapulted the renewable energy (RE) sector to the centre of sustainable development strategies around the world. The basic premise behind the notion of sustainable development is that a centralised and fragmented emphasis on economic growth – at the expense of social and/or environmental costs – is eventually detrimental to the overall wellbeing of the local people [Dhakal, (2012), p.8]. It has been suggested that decentralised and coordinated initiatives in developing countries are likely to be more effective with policies that focus on increasing the uptake of RE, because adequate supplies of energy improve the quality of society and enhance the business and natural environment (Kaygusuz, 2012). REs broadly include energies sourced from: sunlight (solar); water (hydro); wind, biomass and marine (wave); tides (tidal); and geothermal heat. According to the International Energy Agency (IEA), REs accounted for about 13% of the world's total energy production in 2010 and included 9.8% from biomass, 2.3% from hydroelectricity and 0.9% from other REs. In terms of consumption, REs are predominantly used in the residential, commercial and public sectors (IEA, 2012). The United Nation's (UN) Advisory Group on Energy and Climate Change (AGECC) considers universal access to clean and affordable energy as critical for meeting local development objectives (AGECC, 2010; Martinot et al., 2002). The role of RE is crucial in mountainous countries like Nepal, where topography remains one of the major challenges to extending the national grid (Bhattacharya, 2012; Deshmukh et al., 2013) in

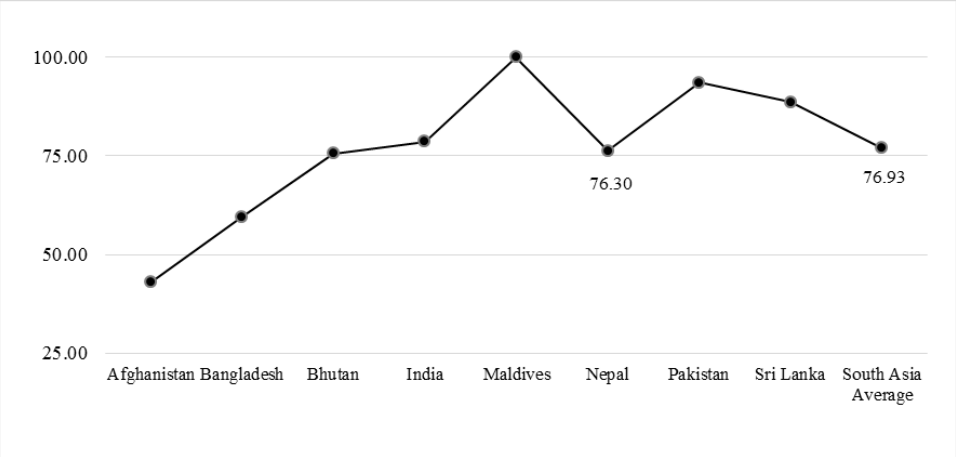
rural areas. Under the assumption that there are fruitful opportunities for linking energy policy and market prospects, this paper explores the central question: 'to what extent is the current policy environment in Nepal conducive to the uptake of solar energy at the household level?'

The paper begins with a brief review of the literature on the RE – sustainable development policy nexus in South Asia, followed by an introduction of Nepal and its energy profile. The methods used for data analyses, together with the findings, are presented next. The paper concludes after a discussion of two propositions on the need to change policy priorities to foster the RE sector in Nepal.

2 RE and sustainable development nexus in South Asia

The state of overall economic development in the South Asian region – Afghanistan, Bangladesh, Bhutan, India, Maldives, Nepal, Pakistan and Sri Lanka – is quite varied. Although these nations are collectively transforming into middle-income economies (see Dhakal, forthcoming), it is estimated that nearly half a billion people in the region lack access to electricity (World Bank, 2016a). Figure 1 shows that the population with access to electricity ranges from between 100% in Maldives and 43% in Afghanistan, with an average of 77% for the region. Cook's (2013) viewpoint that changes in policy priorities are necessary to bridge the energy access divide for sustainable development is nowhere more eminent than in South Asia.

Figure 1 Access to electricity (% of population) in South Asia



Source: World Bank (2016b)

The extant literature on RE policy revolves around four distinct priorities: increasing access, financing mechanisms, research and development (R&D), and cross-sectoral coordination. First, Schmid (2012) has shown that national- and state-level policies are instrumental in ensuring a greater participation of the private sector and in promoting the development of installed RE capacity in several Indian States. Buoyed by this policy success, India has recently unveiled an ambitious policy target to install over 200 GW of solar energy by 2030 and provide electricity access to over a quarter of its population

(da Costa, 2016; World Bank, 2016b). Second, Rahman et al. (2013) have demonstrated that innovative micro-credit financing mechanisms, rather than subsidy, can catalyse the uptake of off-grid solar at the household level in Bangladesh. In particular, partnership arrangements with non-government organisations have enabled millions of households to install solar systems with low down payment options (i.e., 15%) and service charges inclusive of system maintenance. Third, although the R&D component is crucial for fostering technological innovation and catalysing RE uptake, the aspects of R&D have been mostly overlooked in policy measures in the region. For instance, Ansari et al. (2013) argue that the growth in RE uptake in India has been adversely affected due to lack of appropriate and adequate investment in R&D. The authors consider this shortcoming as one of the primary barriers to the uptake of solar systems (p.167). Fourth, RE policy impetus is more likely to be fruitful when there is appropriate coordination with other developmental priorities. Rasul and Sharma (2016) contend that policy interlinkages amongst the water, energy and food nexus are vital for achieving sustainable development aspirations in South Asia. For example, Baruah (2015) has shown that policy coordination for energy access and women's empowerment in India can lead to favourable economic and social outcomes. These four priorities identified in the literature serve as a basis for exploring the linkages between energy and sustainable development policies in Nepal.

3 Nepal and its energy profile

Nepal is a small, landlocked South Asian nation located between two large countries, China and India. There are a total of 3,972 village development committees (the smallest political unit) in 75 districts and Kathmandu is the capital city, located in central Nepal. The latest census data indicate a total population of nearly 27 million people, of which less than two-fifths (17%) live in urban areas (CBS, 2012a). The country abolished absolute monarchy in 1990 but experienced a decade-long Maoist insurgency between 1996 and 2006. The insurgency clearly lessened the economic opportunities for its young workforce, resulting in a large-scale outward migration. The latest estimates suggest that over 10% of the workforce is gainfully employed outside the country (CBS, 2014). Consequently, while rural areas have witnessed a significant decline in the economically-active population, the country has been able to make notable socio-economic progress in rural areas because of a remittance-driven flow of financial capital (Lokshin et al., 2010; Wagle, 2012). For example, the overall poverty rate has been reduced to around 25% and the per capita gross national income (GNI) is now about $730. The average life expectancy is over 68 years and the primary school enrolment rate has increased to 97% (World Bank, 2015). Nonetheless, Nepal is one of the least-developed countries, ranking 145th out of 187 countries in the world in terms of the Human Development Index (HDI) (UNDP, 2014). Given that the country has received nearly US$11 billion in various types of foreign aid over the last 20 years – of which nearly 10% was spent on the energy sector alone (AMP, 2015) – the HDI standing implies that the country will continually need significant donor contributions into the foreseeable future in order to achieve broader sustainable development objectives.

Although over three-quarters of the country's total population now have access to electricity, less than two-thirds (63%) of rural people have access compared to about 95% of urban residents (CBS, 2012a), indicating the divide in energy access. Nepal's national

electricity grid provides electricity to more than 95% of the urban population but reaches only 5% of the rural population. The overall energy consumption pattern in Nepal is negligible and dominated by traditional biomass-based generation of energy (Bhandari and Stadler, 2011). Per capita electricity consumption is around 80 kilowatts per year and the residential sector consumes approximately 90% of the total energy (WECS, 2010). Nepal has a total installed power capacity of 609 MW, of which 9% is thermal power and 91% is hydropower. Hydropower is clearly Nepal's main energy source and has the potential of reaching 83,000 MW (Pokharel, 2001; WECS, 2010). However, out of the 42,000 MW that can be technically harnessed, only 1% of hydropower has been tapped so far (Malhotra, 2010). Because of its inability to develop mega-hydropower schemes, and consequently expand the national grid, Nepal is increasingly dependent on imported fossil-based energy sources and also faces constant power shortages (Nepal, 2012). In order to increase energy access in rural areas as well as increase the demand, policy impetus towards developing a decentralised, affordable and efficient off-grid RE such as solar has been considered a country-appropriate way forward (Mainali and Silveira, 2012). The government plans to increase the share of RE, which is currently around 1% of the country's primary energy supply, to 10% by 2030 (CIF, 2012) to foster sustainable development. This paper adopts an exploratory approach in order to analyse the energy policy environment, as well as explore the state of solar energy uptake at the household level in rural Nepal.

4 Data sources and analyses

The central research question that this paper addresses is: 'to what extent is the current policy environment in Nepal conducive to the uptake of solar energy at the household level?' Since this study is an attempt to crystallise RE issues in Nepal it utilises an exploratory research approach to explore the state of RE in the country. Exploratory studies are often informed by the grounded theory and one of the key distinctions between the confirmatory approach and exploratory approach is that the former aims to test theoretical assumptions while the latter aims to develop informed postulations (see Davies, 2006). The exploratory approach is often appropriate in new areas of inquiry 'where the objectives of the research are: to scope out the magnitude or extent of a particular phenomenon, problem' [Bhattacherjee, (2012), p.6]. In addition, while the outcomes of exploratory investigations may not always impact the decision-making processes immediately, they do have the potential to offer significant policy insights and research directions into the future (see Dhakal and Mahmood, 2014). This paper utilises a two-pronged exploratory approach informed by grounded theory to assess the existing public policy challenges and, more importantly, develop propositions for the emerging issues.

First, Collins (2005) emphasises the significance of content analysis of policy documents in order to identify gaps and suggest improvements. However, although a variety of qualitative techniques exist to analyse the content of textual data the analyses themselves are often subjected to limitations, including (but not limited to) time, human coding and biased interpretations. This paper uses Leximancer-based automated content analysis of Nepal's overarching *Rural Energy Policy* (GNMEST, 2006) in Nepal. Leximancer software provides a quantitative approach to the standard content analysis, and identifies themes and concepts based on the word frequency and co-occurrence of

families of terms (Smith and Humphreys, 2006). The software uses its own algorithms to analyse the meanings within passages of text by extracting main themes based on the most prominent concepts in a cluster of concepts (Reyneke et al., 2011). In Leximancer, the themes are displayed in heat-maps to indicate the level of importance, meaning the most important theme appears in red (hottest) and the next hottest in orange and so on, according to the colour wheel. In addition, the visual representation of theme size is based on the number of 'concepts' grouped underneath each theme (Leximancer, 2011). Several studies have validated the usefulness of Leximancer as a policy analysis tool by comparing stability, reproducibility, and correlative and functional tests (Povey et al., 2013; Mahmood et al., 2014).

Second, an exploratory approach assists researchers to develop a familiarity with the topic and enables them to identify new patterns and postulations (see Kothari, 2004) within currently available secondary data. This paper utilises various publicly available reports with:

a household-level solar uptake data (dependent variable) reported in the *Environmental Statistics of Nepal 2011* (CBS, 2012b)

b district-level HDI1 figures reported in the *Nepal Human Development Report* (UNDP, 2014)

c district-level development projects funded by donor agencies reported in the *Development Cooperation Report* fiscal year 2011–2012 (GNMF, 2013)

d district-level demographic attributes, such as household ownership status, population density, economically-active population (i.e. employed or those seeking employment) reported in the 2011 census (CBS, 2012b).

In order to establish statistical associations between the uptake of solar energy at the household level and independent variables, a Pearson's Correlation test was carried out. Correlation characterises the existence of a relationship between variables. Correlation itself only indexes the degree of a relationship; the statistic that represents this index is called correlation coefficient '*r*' (Williams and Monge, 2001). Correlation coefficients describe how closely two variables are related (Cohen and Lea, 2004). According to the guidelines of Cohen et al. (2007), correlation coefficients can be interpreted as weak (0 to ±0.1), modest (±0.1 to ±0.3), moderate (±0.3 to ±0.5), strong (±0.5 to ±0.8) and very strong (±0.8 to ±1.0).

5 Findings

5.1 Policy environment

Off-grid energy production and distribution responsibilities in Nepal rest with the Ministry of Environment Science and Technology (MEST). In order to promote rural electrification through RE, MEST, in partnership with donor agencies (i.e., Danish, Norwegian and German governments), introduced an energy subsidy program to encourage the uptake of solar home systems in the 1990s. The scheme, known as the Solar Energy Support Programme, was one of the primary components of the Energy Sector Assistance Program, nested within the Alternative Energy Promotion Centre

(AEPC). AEPC was established in 1996 under MEST, with the purpose of promoting and coordinating the development and promotion of renewable/alternative energy technologies in Nepal (AEPC, 2015a). Two of the flagship schemes are the National Rural Energy Programme (NRREP) and the Central Renewable Energy Fund (CREF) (AEPC, 2015b, 2015c). While NRREP is a program modality for promoting and delivering all off-grid REs of less than 10 MW, CREF is a vehicle to mobilise both subsidy and credit funds for the entire RE sector. The role of CREF is particularly significant for the approval and disbursement of the subsidy and is deliberated later in this section. Although it is clear from the recent annual report that over two-thirds of AEPC initiatives are driven by donor interests/funds (AEPC, 2014a, 2014b), the 2006 *Rural Energy Policy* is the overarching government framework relevant in the context of bridging the energy access gap. This policy primarily aims to reduce dependency on traditional energy sources, conserve the environment and increase the living standards of the rural population by increasing access to clean and cost-effective energy (GNMEST, 2006). Because of its significance for providing directions in bridging the energy access gap the content of the policy was analysed using Leximancer software.

Figure 2 Leximancer-generated thematic map of the 2006 *Rural Energy Policy* (see online version for colours)

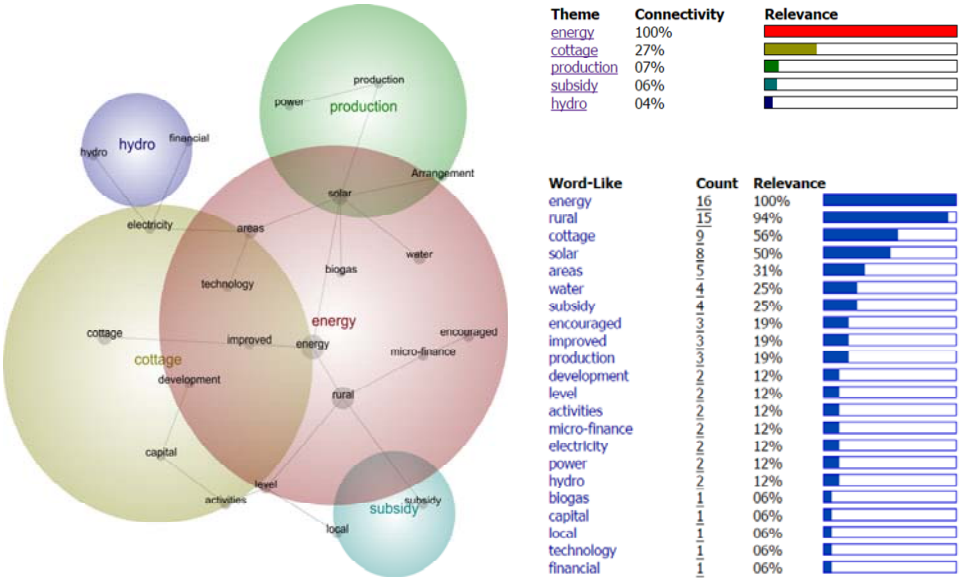


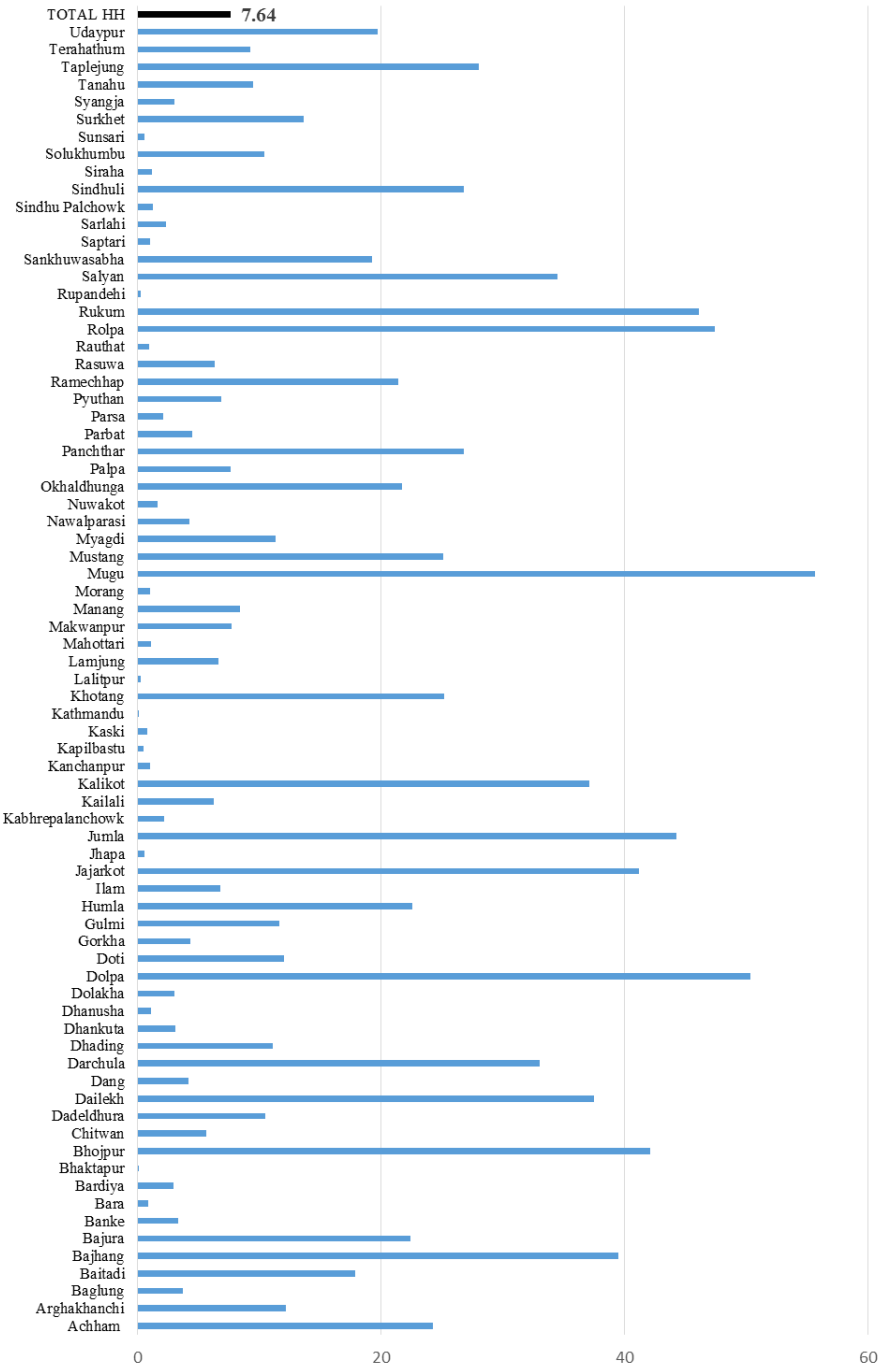
Figure 2 depicts themes and concepts generated by Leximancer. The five themes that emerged in the analysis were: energy (100%), cottage (27%), production (7%), subsidy (6%) and hydro (4%). These are also the areas of emphasis within the policy document. For instance, a policy focus on the hydro theme is only rational because of the country's immense micro-, medium- and macro-hydropower generation potential (Pokharel, 2001). As expected, Energy is the most important (red) theme, followed by cottage. Cottage refers to home-based small and medium enterprises ('cottage industry') in Nepal. Encompassed by the energy theme are words such as 'biogas', 'solar', 'water', 'rural' and

'microfinance' and so forth, suggesting topics around the way the word 'energy' is mentioned in the policy context. For instance, the policy states that: "… AEPC will carry out activities related to formulation of rural energy policy and programmes, studies and researches, subsidy disbursements, technical assistance, selection of companies and organisations installing rural energy systems, donor coordination …" [GNMEST, (2006), p.9]. The figure also shows the count and relevance of key words within the policy document: 'energy' and 'rural' were the topmost relevant words. Since the *Rural Energy Policy* (GNMEST, 2006) envisages cottage enterprises and subsidy as two key drivers of solar uptake at the household level, a closer scrutiny of the 2009 *Subsidy Policy for Renewable Energy* (GNMEST, 2013a) was deemed relevant for the purpose of this paper. The subsidy policy determines the amount of household subsidy for a solar system installed, disbursed through AEPC based on the socioeconomic status of the village development committee, ranging from about US$75.00 to $150.00 per household. In addition, the policy offers a rebate for solar systems installed (up to 75% of the cost but not exceeding US$1250.00) in community-based institutions, such as schools or local health centres.

The subsidy policy also acknowledges the significance of subsidies for strengthening the cottage industry's role in the development and uptake of solar energy. For instance, there is a provision for AEPC-certified RE enterprises (except mini- and micro-hydropower enterprises) to receive a subsidy amount of 30% of the total investment cost for energy conversion and processing equipment, and/or hardware as part of the enterprise/business. However, the certification (in order to be eligible for subsidy), subsidy application, approval and disbursement process is quite bureaucratic and lengthy. On the one hand, the business certification process can take at least three months. On the other, in order for a business to access the subsidy it needs to be first recommended by AEPC's district-level energy unit. In addition, a multi-staged/departmental assessment process can take up to six months for the CREF to release 90% of the subsidy (GNMEST, 2013b). The remaining 10% subsidy is tied to another layer of after-sales service assessment that can be paid only after 12 months from the installation and further AEPC verification. Consequently, businesses generally do not expect to receive the 10% subsidy (SNV, 2015).

If the government is serious about using RE as a vehicle for rural sustainable development the need to coordinate between RE and the cottage enterprises sector is eminent. Cottage enterprises are largely under the jurisdiction of the Ministry of Industry. However, despite RE policy acknowledging the role of cottage enterprises in increasing rural electrification, policy accord between the energy and industry sectors remains absent. For example, the 2010 *Industrial Policy* identified RE-oriented enterprises as a priority sector [GNMI, (2010), p.91] and, yet, the policy is silent on financial and technical support mechanisms specific to RE cottage enterprises. Recognising this gap, AEPC recently signed a memorandum of understanding with the Federation of Nepal Cottage and Small Industries (FNCSI) to foster cottage enterprises mediated uptake of RE in rural Nepal (AEPC, 2014a). Nonetheless, the lack of synchronisation at the policy level means AEPC essentially has a monopoly over subsidy programs, leaving room for manipulation and a mismatch of priorities (see Rai, 2004). For instance, there are only a total of 77 enterprises across the entire country that are considered eligible (certified) to install solar systems and receive the subsidy through AEPC (2015d). The implications of these findings are discussed in the next section.

Figure 3 Percentage of households with solar uptake across Nepal's 75 districts (see online version for colours)



Source: CBS (2012a)

5.2 Solar systems uptake at the household level

It has been estimated that Nepal receives solar radiation that varies from 3.9 to 5.1 kWh/m^2/day, and the sun shines for an average of 6.8 hours per day (Shrestha, 2009). Consequently, it has been argued that the proper exploitation of solar energy can play an important role in fulfilling energy demands in Nepal (see Gurung et al., 2012). For example, the country has over 2,100 MW of potential solar energy waiting to be harnessed (WECS, 2010). Although about 12% of the population has access to electricity through RE sources (GNMEST, 2013a) a very small proportion has been harnessed – 12 MW (0.57%) of the total solar energy potential. Nonetheless, the 2011 *Environmental Statistics of Nepal* (CBS, 2012b) indicate that nearly 200,000 households across 75 districts are utilising some form of solar energy (Figure 3). This uptake amounts to nearly 8% of total households in the country. In order to explore the association between solar uptake and socio-economic variables Pearson correlation tests were carried out between five socio-economic variables:

a total number of household with solar systems

b HDI

c economically-active population in the district

d population density

e number of foreign aid projects running in the district.

Correlation tests unravelled several significant associations, both positive and negative.

As Table 1 indicates, the only 'modest' positive association was between solar systems installed and foreign aid projects running in the districts. Given that the RE promotion is largely fuelled and funded by donor agencies this link is not surprising. Negative 'modest' associations were detected between solar system installations and population density, house ownership and economically-active population as well as 'moderate' negative relationship between HDI and the uptake of solar systems. Given that nearly one and half million rural households in Nepal do not have access to electricity (CBS, 2012b), and are unlikely to be connected to the grid in the foreseeable future, the implications of these findings cannot be ignored in the context of off-grid solar energy and are discussed in the next section.

Table 1 Pearson correlation test between the district's profile and solar system installations

	HHS	*HDI*	*EAP*	*HHO*	*POD*	*FAP*
Households with solar systems *(HHS)*	1					
Human Development Index *(HDI)*	*–.375***	1				
Economically-active population *(EAP)*	*–.260**	.353**	1			
Household ownership *(HHO)*	*–.292**	.171	.724**	1		
Population density *(POD)*	*–.271**	.344**	.225	.479**	1	
Number of foreign aid projects *(FAP)*	*.263**	–.253*	.422**	.279*	–.016	1

Notes: n=75; **correlation is significant at the 0.01 level; *correlation is significant at the 0.05 level

6 Discussion

The content analysis of the *Rural Energy Policy* reveals that the cottage industry and AEPC-managed subsidies are central to bridging the energy access gap. The statistical analyses indicate that socio-economically disadvantaged districts are the highest adopters of solar energy. AEPC's role has been generally lauded by the government as well as donor agencies in the country. For instance, Gurung et al. (2012) point out that the uptake of RE in the country has significantly increased because of the schemes run by AEPC. Although the fact that nearly one-tenth of the total households have adopted solar energy shows the extent of impact of energy policies and institutional arrangements, the donor-driven, AEPC-centric, and somewhat exclusive subsidy schemes, remains problematic. It is in this context that the following two policy propositions are discussed.

6.1 Proposition 1: subsidies can no longer be the overarching RE policy priority

This proposition is founded on an examination of energy policies within the context of Nepal. First, as KC et al. (2011) observed, the government's main focus has been on AEPC-led dissemination of the proven technologies through subsidy rather than establishing an RE-related R&D institution that is compatible with rural sustainable development priorities. Second, while the donor-driven agenda and funding is a norm in the South Asian region (see Dhakal and Mahmood, 2014; Mirza et al., 2009; Uddin and Taplin, 2008), the availability of donor funds is neither sustainable nor predictable, and that is why policies that support market-centric approaches as much as – if not more than – donor-dependent subsidy initiatives are needed. As has been pointed out, while continuing subsidies are necessary for the poorest of the poor in Nepalese society, subsidy policies by themselves are unlikely to help the growth of the RE sector (Barnes and Halpern, 2000; Kojima, 2013; Martinot et al., 2002). Third, just as Khare et al. (2013) point out that centralised and uncoordinated approaches between various government agencies stifle the RE sector, policy synchronisation between the Ministry of Industry and Ministry of Environment, Science and Technology is necessary to enable RE-specific cottage enterprises at the local level. Fourth, as reported by SNV (2015), the majority of promotion, installation and after-sales services in rural areas are carried out by non-certified companies. The fact that only an extremely limited number of companies are qualified and eligible to receive RE subsidy cannot be seen as inclusive and encouraging the private sector, as envisaged by the 2006 Rural Energy Policy.

6.2 Proposition 2: the RE policy priority needs to be based on emerging evidence rather than antiquated donor assumptions

This proposition is founded on an examination of correlations between the uptake of solar systems and socio-economic attributes at the district level. Although statistical association alone does not necessarily convey the causality, the significant relationship between the level of solar systems uptake and socio-economic attributes of districts does reflect on broader socio-economic issues in Nepal. Since rural districts (with less numbers of people) are likely to be outside the national electric grid the negative relationships are clearly rooted in the context of the poverty and foreign aid nexus. For instance, donor agencies have traditionally focused on socio-economically disadvantaged

districts in Nepal, where the economically-active population has often migrated to urban areas or even outside the country (Paoletti et al., 2014; Bhattarai, 2007), and who are unlikely to have outright ownership of their dwellings. These observations are therefore consistent with qualitative analysis that the targeted RE-specific subsidies driven by donor interests are driving the solar energy uptake across rural Nepal (IFC, 2012). The offshoot of a declining, economically-active population because of increasing labour migration from Nepal is that the volume of remittance flows in rural Nepal has significantly increased in recent years (Sapkota, 2013). Consequently, the rural population has greater access to financial capital and are willing to invest in off-the-grid RE, such as solar systems (see Mainali and Silveira, 2012). It is evident that these changing socioeconomic characteristics of rural Nepal challenge the age-old donor assumption that equates rural with poverty. More importantly, these changes need to inform the future RE policy adjustments that are grounded in unfolding evidence and market opportunities rather than the antiquated donor mentality. Only then can RE policy posit increased solar uptake, not only as a way to bridge the energy access divide but also as a vehicle for broader sustainable development.

As with any empirical studies there are limitations to this analysis. First, this is an exploratory research study that relied on secondary data analysis techniques. Second, the earthquake that struck Nepal in April 2016 claimed nearly 9,000 lives, injured over 22,000 people and damaged or destroyed 850,000 homes (NDRR, 2015). This study used pre-earthquake data, as the extent of the earthquake's impact on households with installed solar systems is unavailable as yet. Future studies could build on this analysis and explore the implications of the earthquake on the RE sector as well as how RE policy and the market has evolved in the post-earthquake environment.

7 Conclusions

This paper began by highlighting how REs have become more important in the context of meeting sustainable development challenges of South Asian nations. Nepal was identified as of special interest as it is a developing country with a mountainous terrain and, as such, is particularly suited to local off-grid energy solutions. It further identified the low contributions of REs towards fulfilling the country's mostly residential energy needs. The paper primarily examined the current energy policy environment in Nepal and the uptake of solar energy at the household level. The quantitative data analyses reveal that the uptake of solar systems has spread to nearly one-tenth of the country's households. Socio-economically disadvantaged districts in the rural parts of the country are the highest adopters of solar energy, at least partially because of foreign aid projects, making donor agencies critical players in overcoming the energy access challenge. The qualitative analysis of the policy environment reveals that RE-related flagship programs, including a subsidy mechanism, are largely dependent on donor agencies driven by obsolete assumptions. In accordance with the recommendations of the Global Conference on Rural Energy Access (UN, 2014), it is necessary to address the urban–rural electricity divide in order to achieve the sustainable development aspirations. In this regard, rural electrification in Nepal, and particularly the role of REs, will increasingly become crucial in the post-earthquake scenario. Nepal's RE sector, especially the solar segment, is clearly in its infancy and, other than 77 qualified enterprises, the segment is yet to broadly benefit from existing policies and mechanisms. There is no doubt that the role of

AEPC in policy development and implementation has been encouraging, particularly with the support of donor agencies. However, excessive reliance on a donor-driven and funded subsidy mechanism is deemed problematic, because when donors' interest withers AEPC may no longer be able to afford to operate/promote solar energy. In order to facilitate the uptake of RE in rural Nepal as a way to bridge the energy access gap this paper contends that policy priorities that take into consideration the changing rural socioeconomic realities and support market-centric approaches – as much as, if not more than, donor-centric subsidy initiatives – are needed.

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Notes

1 The HDI is a tool developed by the UN to measure and rank county-wise socio-economic development based on the criteria of: a) life expectancy at birth b) mean years of schooling c) expected years of schooling and d) GNI per capita (UNDP, 2014).