



Review

Of pilferers and poachers: Combating electricity theft in India

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ABSTRACT

Electricity theft is a growing problem worldwide. India, like many other developing countries, is in the grips of electricity theft. To address this challenge, the country introduced various technological solutions, which failed to realize their promised potential. Despite little success, majority of theft-combat interventions continue to emphasize technology and downplay psycho-social factors. The latter calls for deep exploration as power-utility employees have been found to connive with consumers in majority of electricity thefts. Though, employee theft has been explained by distinct perspectives like sociology, psychology, criminology, organizational science etc., none describes the phenomenon completely. In order to gain a holistic understanding, it is imperative to integrate the said perspectives. That's precisely what this paper attempts- It proposes an integrated conceptual framework of the psycho-social factors that predispose employees to collude with consumers in electricity theft.

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1. Introduction

Electricity theft is a pervasive scourge. It is estimated that power utilities worldwide lose over USD 25 billion every year due to electricity theft (Overview of power distribution cited in Depuru et al. [34]). In developing countries, up to 50% of electricity is acquired by theft [7]. The situation in many South Asian and African countries is particularly worrisome [34]. In India, a major chunk of the commercial losses is attributed to electricity theft [13,66]. In Nigeria, many households have been found involved in different forms of electricity theft and tampering of meters [36]. Electricity theft has impacted developed countries too – in the US, 80% of the commercial losses stem from theft or metering defect [86]. In the UK, it is estimated that electricity worth GBP 173 million is obtained dishonestly every year [110].

Electricity theft not only affects the institutional organizations of the sector, but countries too. The losses resulting from electricity theft prevent countries from- a) reducing tariffs paid by customers, b) subsidizing electricity consumption of socially sensitive users, c) extending access to electricity to the unserved population (the poor and socially unprotected) [7]. Therefore, elimination of these losses becomes the top priority for any country for improving the quality of life of its citizen. Driven by the magnitude of the problem, countries look for solutions in the advanced technologies such as smart grid. But, the fact that theft and losses are showing an uptrend in an era of technological-means like metering [14] suggests that technology alone is not sufficient to nail the menace. It has been demonstrated that electricity theft is possible even in Advanced Metering Infrastructure System [85]. Still, power utilities obscure the problem to push for technical solutions like new technology, additional investments and subsidized financing that are politically convenient [58]. Power utilities need to realize that an intervention for combating electricity theft can only be successful if it looks beyond technology and brings-in behavioral changes in employees engaged in management of distribution network and electricity consumers [98]. Above all, they need to understand how to introduce behavioral changes which are not perceived overtly controlling [113].

Exploration of the employee aspect becomes all the more important, given that the power utilities lose big revenue due to connivance of its employees and consumers [2,14,58]. Since, electricity theft by consumers with the assistance of utility employ-

ees constitute a dominant form of commercial losses, it is called employee theft [2]. The literature is replete with multiple and distinct perspectives on employee theft, which have origin in sociology, psychology, criminology, organizational science etc. [55]. Though, each perspective contributes to the understating of employee theft, none paints a complete picture [52]. Accepting the idea that each perspective may carry truth, it becomes important to consider all [55], hence there is a need to integrate the existing perspectives for developing an effective intervention to check employee theft. That's precisely what this paper attempts to achieve, with Indian power distribution system as the backdrop. India's ongoing struggle to reduce high electricity theft, despite having introduced many reforms and advanced technologies, makes it a worthy case. Though, the paper puts India under spotlight, yet its findings are applicable to other developing countries in South Asia, Africa and beyond. In the end, the paper suggests an integrated conceptual framework of the psycho-social workplace factors that predispose employees to connive with consumers in electricity theft.

The rest of this paper is structured as follows- Section 2 presents the status of Indian power sector, and Section 3 its constituents. Sections 4 and 5 detail the financial, and Aggregate Technical and Commercial (AT&C) losses, respectively. Section 6 throws light on electricity theft, Section 7 on the measures to combat it, and Section 8 describes the limitations of technology in combating electricity theft. Section 9 details the role of employee in electricity theft and Section 10 equates connivance of employees with consumers in electricity theft with employee theft. Sections 11 and 12 discuss various perspectives on employee theft and the need to integrate them, respectively. Section 13 suggests the integrated conceptual framework, and conclusion is presented in Section 14.

2. Status of Indian power sector

Like any other developing country, India too is largely dependent on power sector for sustained growth [98]. The demand for power in India is assumed to grow at 5% per annum through 2030 [121]. The Government of India too realizes that an efficient, resilient and financially robust power sector is a necessity not only for growth, but also for poverty reduction [87].

The Indian power sector has traversed a long way since liberalization of Indian economy (over two decades ago) and enactment

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