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Digitalized Welfare for Sustainable Energy Transitions: Examining the Policy Design Aspects of the Cooking Gas Cash Transfers in India

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Abstract: This article examines the extent to which digitalized welfare harmonizes the socio-economic goals of economic reform and low-carbon energy transitions in an emerging democratic context. It analyzes digitalized welfare's effectiveness in facilitating sustainable energy transitions through market mechanisms using a centralized approach to welfare delivery. Using narrative analysis, this article describes the shift to the direct benefits transfers regime from a regime of indirect subsidies for cooking gas in India. It describes the design aspects of various government programs through which target populations are socially constructed, as part of the policy of cooking gas cash transfers in India. Further, it analyzes the role of the practices of communicative governance and digitalization in calibrating the key policy characteristics to strengthen policy legitimacy. The insights from this article contribute to the emerging body of the theory and practice of digitalized welfare for sustainable energy transitions.



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Keywords: sustainable energy transitions; sustainable public administration; digitalized welfare; technopopulism; policy design; citizen–state interactions; constructivism; interpretivism; narrative analysis

1. Introduction

The Sustainable Development Goal (SDGs) articulated by the United Nations Organization aspire to ensure access to affordable, reliable, sustainable, and modern energy for all by 2030 [1] (p. 81). Energy poverty refers to “the lack of sufficient alternatives and necessary conditions for access to adequate, economical, reliable, secure and environmentally sustainable modern energy services which help in achieving economic and human development” [2] (p. 1). More than 2.5 billion people in the world lack access to clean cooking fuels. Making clean energy accessible to all can prevent diseases and premature deaths.

Sustainable energy transition refers to the shift from fossil fuel use to clean fuels that are based entirely on self-sufficient and renewable energy resources. Given the adverse health consequences from solid fuel use, the transition to low-carbon fuels is a necessary and pragmatic step toward sustainable energy transitions. Residential coal and biomass consumption are key sources of fine particulate matter that lead to indoor air pollution (IAP) [3]. Widening the access to relatively cleaner fossil fuel sources such as liquefied petroleum gas (LPG) is a key strategy in many developing countries to mitigate the effects of IAP.

Digitalization can be understood as “a sociotechnical process of applying digitizing technologies to broader social and institutional contexts”, where digitizing refers to “a technical process of converting analogue signals into a digital form” [4] (p. 749). Digitalized welfare refers to the deployment of digital technologies within the processes of adjudication and delivery administration of welfare programs. As part of utilitarian strategies

to maximize the use of scarce public resources, governments target the deserving social groups and exclude those social groups considered undeserving.

Digitalization facilitates the strategies of regulatory welfare by interlinking the digital identity (digital ID) of policy targets with authentication mechanisms such as the Know Your Customer (KYC) systems, payment systems interlinked with sectoral delivery platforms, consent management systems, and so on. In doing so, they enable the government to interact with citizens in unprecedented ways and facilitate the creation of new and differentiated relationships with various social groups. The use of digital technologies within the public sector is part of the rationalizing trends within society aimed at addressing the problem of decoupling, which Bromley and Powell ([5], p. 483) argue is commonly (and incompletely understood) 'as a gap between policy and practice'. Instead, they suggest 'a more prevalent and consequential form of decoupling—a gap between means and ends'.

Scholars have engaged with the effects of IAP, the need for energy transitions, and the design of energy mixes [6]. However, there is a lack of in-depth analysis of the characteristics of the policy design and implementation aspects of public policy and the digitalization strategies and practices that have emerged in the last decade to facilitate sustainable energy transitions. There is also relatively less attention to factors relating to the domestic political economy [7] (p. 531), and the role of leadership in giving effect to sustainable energy transitions [8]. To address this gap, this article analyzes the policy design aspects of India's cooking gas cash transfers and their role in the social construction of target populations. It seeks to engage with the research question: How does digitalized welfare shape the policy design of sustainable energy transitions? This article will answer this research question using the case study of the Direct Benefits Transfers (DBT) policy for cooking gas cash transfers in India.

The goal of this article is to present an in-depth analysis of how digitalized welfare shapes sustainable energy transitions in the context of India. To this end, rather than providing a snapshot of outcomes, it describes and analyzes the processes of energy subsidy reform policy, the policy characteristics that facilitate the social constructions of target populations, and the dynamics of policy implementation that in turn lead to policy feedback [9]. While acknowledging that the representations of sustainability vary across global, national, and local settings, towards a shared understanding of the risks and opportunities inherent in using digitalized welfare to transition towards advancing sustainability, this article presents a single-country case study of the design of the digitalized welfare policy of cooking gas cash transfers in India [10].

The rest of this article is structured in the following manner: the second section outlines the key theoretical underpinnings that guides the policy analysis; the third section outlines the case study approach, interpretive methodology, and the methods of narrative analysis; the fourth section presents the case study of cooking gas cash transfers in India; the fifth section presents the analysis and discussion; and the sixth section presents the conclusions of the research.

2. Conceptual and Theoretical Underpinnings

2.1. Designing Policies for Attaining Sustainable Development Goals (SDGs)

Meta-concepts such as sustainability symbolically represent the perspective of the broader community and function like 'boundary objects' [11]. Boundary objects are those "which are both plastic enough to adapt to local needs and the constraints of the several parties employing them, yet robust enough to maintain a common identity across sites" [12] (p. 393). Syntactically, a boundary object "establishes a shared syntax or language for individuals to represent their knowledge"; semantically, it "provides a concrete means for individuals to specify and learn about their difference and dependencies across a given boundary"; and pragmatically, a boundary object facilitates "a process where individuals can jointly transform their knowledge" [13] (pp. 451–452).

According to Ansell [11], sustainability as a meta-concept has three distinguishing properties, namely (1) functioning as a boundary concept, (2) multi-vocality, and (3) ambi-

guity. As a boundary concept, sustainability links the concepts of environmental protection and economic development and seeks to morally bind those seemingly contradictory terms. Secondly, sustainability holds different meanings to different organizations. Thirdly and lastly, the ambiguity inherent in the concept of sustainability allows it to become an accepted point of reference, to evolve and be adapted to a wide range of situations, contexts, places, and times, allowing for different constituencies to rally behind the concept.

Ansell [11] acknowledged that the adjective ‘sustainable’ has become appended to a wide range of goals such as energy transitions and development. He observed ‘Whether sustainable development remains a “robust” concept or is added to the dustbin of conceptual history’ will depend on how it is put into practice. Therefore, a focus on public administrative practices is critical to assessments of sustainable development and sustainable energy transitions.

The 2030 United Nations (UN) agenda was adopted by all the UN member states in 2015. The SDGs contain a series of 17 core goals supported by 169 targets. Of these, SDG 7 refers to “affordable and clean energy”, and SDG 10 pertains to “reducing inequality” [1] (p. 81). For many developing countries seeking to improve access to relatively cleaner fuels, the fluctuations in global oil prices, the extent of foreign exchange reserves, and the relative strength of their own currency are key factors to maintain balance and not expand their fiscal deficit. On the other hand, they also must fulfil the imperative to expand affordable access to LPG and other relatively clean fuels to mitigate the risks from IAP.

Massey [1] (p. 80) perceptively noted that the achievement of all other SDGs is contingent on SDG 16, which refers to “peace, justice, and strong institutions”, and SDG 17, which deals with the “partnerships to achieve the goal”, both of which together embody the need for good governance. The liberalization of economies in the late twentieth century has led to the embracing of the new public management (NPM) paradigm, which embodies a cluster of ideas such as collaborative governance, change in the public sector’s role as an enabler, and information and communication technologies (ICTs) to accomplish the digital transformations. Since the gradual embrace of NPM practices in the 1980s, governments have faced the challenge of coordinating policy goals across a diverse set of governance actors. Sustainable public administration refers to the broad set of policy and administrative practices advanced by governance actors to realize sustainable development goals.

The conceptualizations of policy design vary among scholars depending on whether they view politics and policy design as “discrete fields of activity in the policy process” or whether they consider that politics is a “way of acting that permeates policy design itself” [14] (p. 40). There are a broad range of approaches and disciplinary perspectives that guide the study of policy design [15]. Although scholars have moved away from treating politics as strictly separate from policy design, depoliticized approaches that support technocratic problem solving continue to inform the study of policy design.

In contrast to such technocratic approaches, this article builds upon the constructivist perspective on policy design [16], which focuses the attention on the contingent processes through which target groups are created in policy design. Drawing from the work of Barbehön ([17], pp. 107–108), it analyzes policy instruments as packaged forms of knowledge and focuses on the practices through which policies are enacted. To assess the feedback effects of policy on different target groups, it draws from the work of Campbell [18].

2.2. Digitalized Welfare and the Transformation of Social Policy

In recent times, scholars have theorized the effects of digitalization in the transformation of welfare delivery and social policy. Digitalization has led to greater centralization in the functioning of public organizations, the reduction of discretion for frontline bureaucrats [19], and enhanced the ability of governments to govern by stealth [20]. The centralization of policymaking and implementation has reduced the role of frontline agents and other local intermediaries.

By utilizing the disintermediating affordances of digital technologies, governments are increasingly adopting communicative governance, i.e., the integration of ‘the logic

of old and new media into the making and implementation of public policies' [21]. In many countries, this has led to the emergence of technopopulism as "an organizing logic of electoral competition based on the combination of populist and technocratic discursive tropes and modes of political organization" [22] (p. 20). In this context, it is important to understand how digitalization shapes the design and implementation of policies to advance sustainable development goals.

In the last decade, many countries have launched projects to issue a digital biometric identity (digital ID) to its citizens and residents. This has facilitated the linking of interests, identities, forms of knowledge, and resources—a phenomenon that Esmark ([23], p. 502) characterized as connective governance. By utilizing the affordances of advanced digital technologies, in the last decade, many governments have launched digitalized welfare policies. There is relatively less research in the global South, where digital technologies are often deployed in the absence of adequate regulatory safeguards to advance policy goals. In their recent report, the Center for Human Rights and Global Justice at New York University noted that across the globe, a "specific model of digital ID is being promoted, which draws heavily on the Aadhaar system in India as a source of inspiration" ("Paving a Digital Road to Hell? A Primer on the Role of the World Bank and Global Networks in Promoting Digital ID", [24], p. 6). The examination of the Aadhaar-centric digitalized welfare being implemented in India would contribute a broader understanding of the potential and risks associated with such a model of digitalized welfare.

2.3. Policy Design Characteristics and Their Feedback Effects

Scholars have theorized that policy design produces the social construction of public policies, i.e., "the cultural characterizations or popular images of the persons or groups whose behavior and well-being are affected by public policy" ([25], p. 334). Similarly, drawing from policy feedback scholarship, Wichowsky and Moynihan [26] called for attention to citizenship outcomes: the effects of policy design and implementation on individual civic capacities and dispositions and on social bonds of civic reciprocity and trust. The effects of policy design and implementation can be understood in terms of policy feedback effects. Drawing from the work of Pierson [27], Mettler [28] (p. 352) differentiated policy feedback into resource effects, i.e., "how the resources and incentives that policies provide shape patterns of behavior" and interpretive effects, i.e., "the meanings policies convey about citizens' standing in the eyes of the government".

According to Campbell ([18], pp. 338–341), the policy characteristics that generate feedback include (a) the size of the benefits, (b) visibility and traceability of government benefits, (c) diffusion of beneficiaries (proximity and concentration), (d) benefits duration, and (e) program administration. Digitalization has enhanced the ability of modern governments to shape policy feedback effects through invisible and subtle forms of authoritative interventions such as nudges. The communicative nature of governance in the current era that utilizes digital technologies has fundamentally transformed how the characteristics of policy design can be calibrated to shape policy feedback. For this reason, digitalization creates new opportunities and challenges for policymakers in shaping citizenship outcomes for different social groups. In doing so, digitalization supports the shift from universal to targeted welfare delivery that is already underway.

A growing body of scholarship has drawn attention to the exclusionary effects of welfare targeting. Research by Watson [29] has shown that welfare conditionality reduces civic membership and the belief that ordinary people can influence what the government does. Latino immigrants in the United States were disproportionately affected by red tape, thereby reducing their participation in the political arena [30] (p. 68). In contrast to the evidence from Anglo-Saxon countries, in Zambia, a low-capacity democracy, Hern [31] found that, compared to citizens without any access to public services, those with even marginal access to services are more likely to report higher levels of political engagement and political participation.

Policy design shapes not just the participatory behaviors of citizens but also their perceptions of procedural justice and policy legitimacy. Procedural justice refers to the notion held that the processes of citizen–state interactions as being characterized by “neutrality, lack of bias, honesty, efforts to be fair, politeness and respect for citizens’ rights” [32] (p. 7). Transparency is a key element in fostering perceptions of procedural justice. Similarly, Kaufmann and Tummers [33] found that a higher level of red tape is associated with lower procedural satisfaction. Digitalization has the potential to enhance governmental transparency and strengthen the ability of public organizations to discreetly regulate the access to welfare and public services. Therefore, assessments of digitalized welfare should pay attention to the contextual deployment of the affordances of digital technologies and how they shape citizenship outcomes.

Policy legitimacy, according to Tyler ([32], p. 375), “is a psychological property of an authority, institution, or social arrangement that leads those connected to it to believe that it is appropriate, proper, and just”. Such policy feedback is mediated by “the experience with the institutions that deliver the policies, and the images put forth by the interests that support or oppose the policies” [34] (p. 431). Governments increasingly use digital technologies to buffer their central position, i.e., nodality in the information network, the ability to exercise state power (authority), the ability to control finances (treasure), and to organize the relationships between social actors (organization) [35]. In this context, a policy analysis of the role of digitalized welfare in reconciling the goals of sustainable energy transition and economic development can be a useful guide to practice.

Policy feedback refers to the ways “policies, once enacted, restructure subsequent political processes” ([36], p. 58). Academic scholarship has focused more on positive feedbacks relative to negative feedback. In contrast to positive feedback, according to Weaver ([37], pp. 137–140), negative feedback refers to “the consequences of policy that tend to undermine rather than reinforce the political, fiscal or social sustainability of a particular set of policies”. He theorized that negative feedback is considered as ‘bearable irritants’, and their effect on a policy regime may not be long-lasting. Negative policy feedbacks lead to policy regime decay only if they persist for a long time [38]. This discussion about negative feedback needs to be further contextualized by evidence from Hern [31] that in a context characterized by an expansion of welfare or service provision in low-capacity democracies, even partially effective policies can produce positive feedback. A focus on policy feedback can reveal how policy design mediates citizenship outcomes.

3. Methodology

In the context of energy politics in India, Powell [39] argued against ‘technocratic analyses and projections based on simulation models that dominate the academic literature’ and called for a theoretically informed analysis that directs ‘focus on political and economic power relations at the national, regional, and domestic levels when tracking poor outcomes of energy choices and policies’. This article adopts a constructivist point of view in which scientific work is considered a social practice of knowledge production [17] (p. 113). Given its emphasis on “meaning making” and knowledge-seeking about “how human beings, scholars included, make individual and collective sense of their particular worlds” [40] (p. 46), this article adopts the interpretive methodology and the narrative analysis method to explain the design of digitalized welfare policy for cooking gas cash transfers in India and its feedback effects.

The narrative analysis is an interpretive method suited to unpack the practices of governance in terms of the beliefs that shape them. As Bevir ([41] p. 283) noted that a narrative analysis rests on the assumption that analysis needs to treat data as evidence of beliefs or meanings. Accordingly, the evidentiary sources are used to understand the actions of both the governance actors in terms of policy design and policy feedback effects by policy targets and other stakeholders. This research is informed by evidence from published reports, firsthand news reports, academic articles, and publicly available data

regarding the design and implementation aspects of the cooking gas cash transfers policy in India.

4. Case Study: Cooking Gas Cash Transfers in India

This case study section is structured as follows. It begins with an overview of the state of access to clean cooking fuels in India. The second sub-section of this case study outlines the key policy initiatives by the Indian government to affect a technocratic shift from welfare policy from indirect subsidy of cooking gas to direct benefits transfers. The third sub-section then briefly discusses the targeting mechanisms used by the government and their limitations. The fourth sub-section elaborates how governments use the attributes of nodality, authority, treasure, and organization to advance the policy goals of reconciling economic development with sustainable energy transitions. The analysis and discussion of the case study in the fifth section engages with how sustainable public administration unfolds in practice in the Indian context.

4.1. State of Clean Cooking Fuel Access in India

In India, there has been a gradual progress in the transition of households in urban and rural areas to clean cooking fuels. While 46.9% of households in urban and 5.1% of households in rural India used clean fuel for cooking in 1999, the percentage has increased to 88.6% of households in urban India and 42.3% of households in rural India in 2021 (Figure 1). This shows that the strategy of expanding access to cooking gas since 2013 has achieved considerable progress in mitigating the dependence on solid fuels.

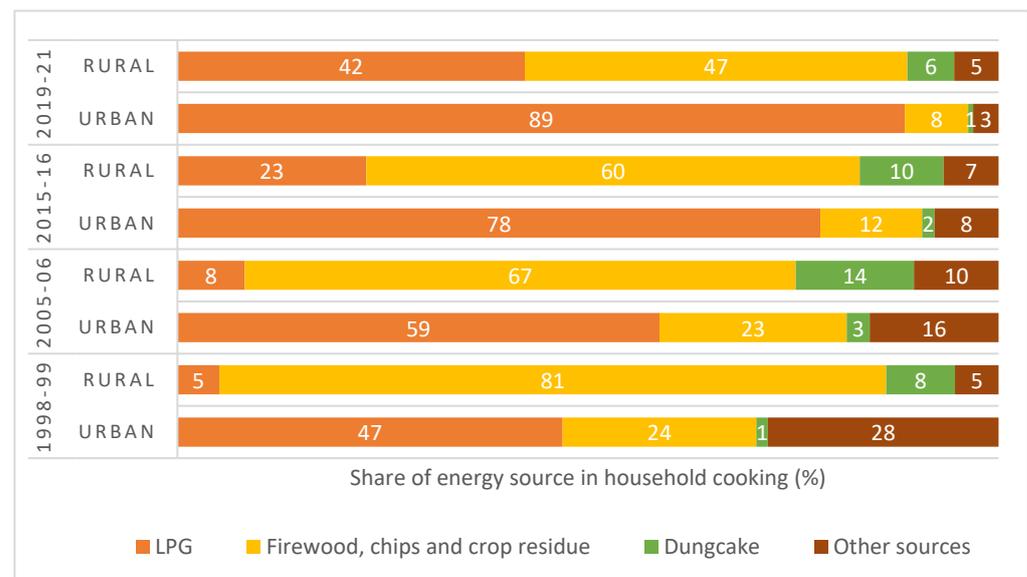


Figure 1. Source of energy for household cooking in India. Source: National Sample Survey (various rounds) [42]; National Family Health Survey (NFHS), 2021 [43].

Historically, the spatial distribution of reductions in energy poverty was skewed towards the relatively large and wealthier states in India and towards urban and semi-urban areas relative to rural areas. According to Clarke ([44], p. 3), in the financial year 2012–2013, ten Indian states, namely Maharashtra, Uttar Pradesh, Tamil Nadu, Andhra Pradesh, Karnataka, West Bengal, Gujarat, Rajasthan, Delhi, and Kerala, had together accounted for over 75% of total domestic LPG subsidy transfers. The Indian government had focused its targeting policies on overcoming this regional inequality in access. Even today, the state-wise LPG coverage reveals that in east and northeast India, access to LPG/PNG continues to be low as compared to the southern and northern states (Figure 2).

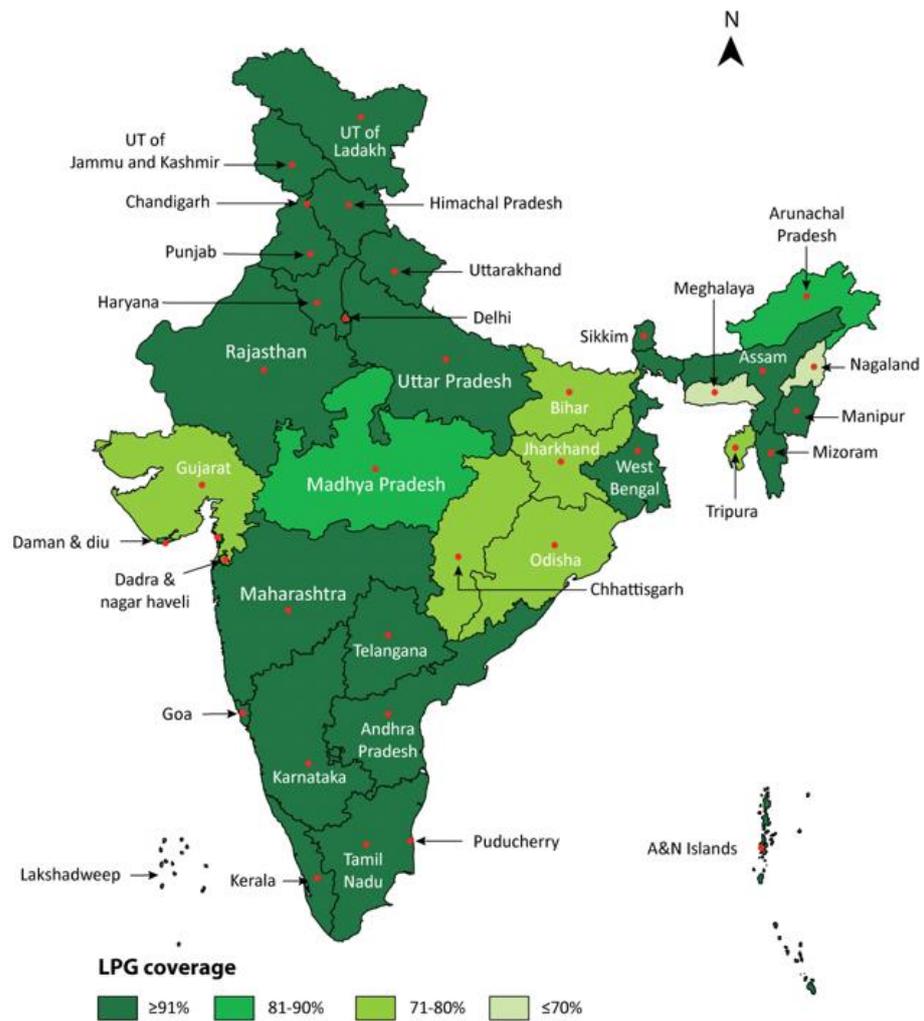


Figure 2. Distribution of states based on percentage of population with access to LPG/PNG. Source: Ministry of Petroleum and Natural Gas, Government of India (MoPNG, GoI), 2021 [45].

Since the shift towards cooking gas cash transfers in 2015, the access to cooking gas has improved from 149 million households in 2015 to 370 million, as shown in Figure 3. Most of this expansion has occurred in states where solid fuel consumption was previously high. The contributory factors for the expanded access are detailed in the next sub-section.

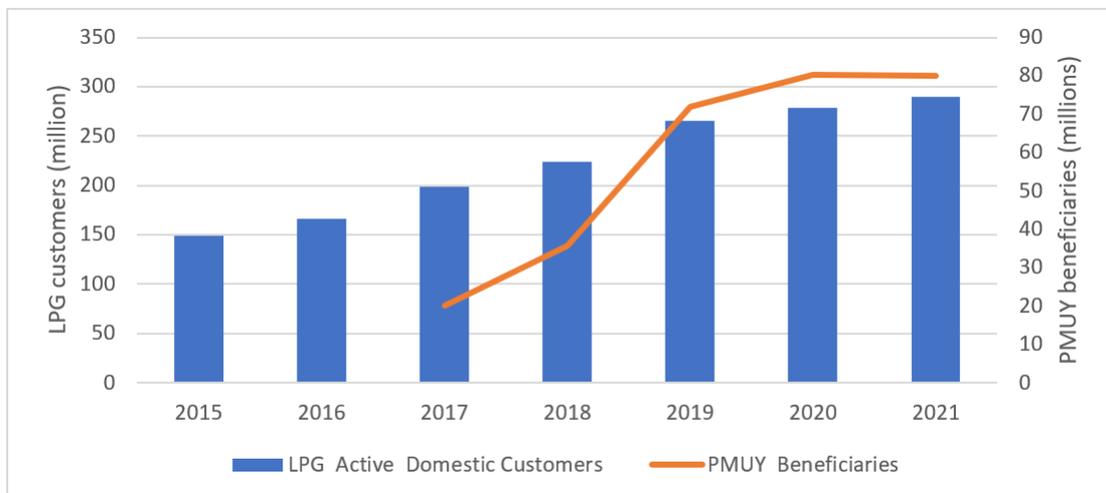


Figure 3. Households with access to LPG connections (in millions). Source: MoPNG, 2021.

4.2. Policy Initiatives for Expanding Access to Clean Cooking Fuels

India is a lower-middle-income country that is characterized by inequalities in access to public goods and services. Dabadge et al. ([46], p. 69) observed that IAP is identified as four of the top five causes of mortality and morbidity in India. Clean cooking fuels are a highly cost-effective health intervention. As an oil-importing country, India must balance the imperative to facilitate low-carbon energy transitions with the implications of a high oil import bill for its overall economic development.

The advances in digital technologies and India's ongoing efforts to utilize them motivated policymakers in the twenty-first century. In 2012, the committee headed by Vijay L. Kelkar submitted its report on the 'Roadmap for Fiscal Consolidation' to the Indian government [47]. The report recommended the use of Aadhaar, India's 12-digit biometric identity number 'as proof of identity (POI) and proof of address (POA) for banking, financial services, LPG, and various other Government services at the Central, State, and Local Government levels' and a shift to what has come to known later as the 'Direct Benefits Transfers' or DBT in order to 'ensure the transfer of Government benefits to the intended beneficiaries, while curbing expenditure on fakes, duplicates, and ghosts'.

The Indian government appointed Nandan Nilekani, the former head of the Indian Information Technology (IT) company Infosys as the chairman of the Unique Identity Authority of India (UIDAI). He was appointed, as the head of committees on the 'Technology Advisory Group for Unique Projects' [48] and the 'the Task Force on Direct Transfer of Subsidies on Kerosene, LPG and Fertiliser' [49]. The recommendations from those committees eventually culminated in the launch of the Direct Benefits Transfer for LPG (DBTL) in June 2013. The DBTL marked the first integrated efforts toward digitalized welfare in twenty-first-century India.

Digitalized welfare in the Indian context simultaneously signaled a change in policy from indirect to direct subsidies, from in-kind subsidies to cash transfers, and towards the use of Aadhaar digital biometric identity as a common identifier for public services and welfare access to make the citizen visible to the state. In response to an interim ruling by the Indian Supreme Court, the Indian government, in March 2014, ordered the scheme to be 'held in abeyance' and appointed a committee headed by the former Chief Justice S.G. Dhande to review the implementation of DBTL and suggest changes. The Dhande committee recommended that the consumers have faced hardships and suggested changes in 'scheme design' to overcome challenges in the implementation of DBTL [50].

A study by Barnwal [51] based on evidence gathered through quasi-experiments, had found that welfare targeting through the Aadhaar-centric DBT had reduced the diversion of cooking gas subsidies. The report of the Comptroller and Auditor General of India on Implementation of PAHAL (DBTL) Scheme (Pratyaksh Hanstantrit Labh Yojana) also reiterated the findings but noted that 'the risk of diversion of nonsubsidised domestic LPG to commercial consumers still remains' [52]. Further, the CAG report noted that the estimated savings from the shift towards DBT is lower than Indian government's claims.

Under the newly elected government headed by Indian Prime Minister Narendra Modi, the DBTL program was renamed and launched through a series of three inter-linked schemes or programs to give effect to cooking gas cash transfers:

1. PAHAL (Pratyaksh Hanstantrit Labh or DBT in Hindi) is the renamed version of the DBTL program, and it was relaunched in January 2015.
2. Give It Up: In March 2015, the Indian Prime Minister launched a massive publicity campaign called 'Give It Up', urging the cooking gas consumers from the relatively better-off sections of the society to voluntarily surrender their cooking gas subsidy so that their benefits can be directed toward poor families. On 28 December 2015, the Indian government notified the restriction of cooking gas benefits to only where the consumers or his/her spouse had a taxable income of less than Indian Rupees (INR) 1,000,000 (~12,603 USD) during the previous financial year [53].

PMUY/Ujjwala: In May 2016, the Modi government launched a scheme called the Pradhan Mantri Ujjwala Yojana (literally known as the Prime Minister's Brightness Program

in Hindi. PMUY is hereafter referred to as *Ujjwala*), which sought to distribute 50 million LPG connections to women from Below Poverty Line (BPL) families. The *Ujjwala* program functions as a gateway for BPL households to shift from solid fuels to the PAHAL/DBTL cooking gas cash transfers by subsidizing the one-time installation expenses of a cooking gas connection.

Together, the PAHAL, Give It Up, and *Ujjwala* programs are geared towards affecting a technocratic shift towards targeting cash subsidies through digitalized welfare.

4.3. Targeting Mechanisms

India does not have a centralized list of households below the poverty line. The designation of the categories of above poverty line (APL) and below poverty line (BPL) is often a subject of political contestation [54]. As part of efforts to address this issue, the Indian government relied on the Socio-Economic Caste Census conducted in 2011 (SECC-2011). Retired bureaucrats [55] and academics [46] acknowledge that even the use of SECC-2011 data is prone to exclusion errors.

The government's rules mandate that a beneficiary should be selected from the list of poor households under SECC-2011. They exclude those who fulfil the high-income criteria of INR 1,000,000 (~12,603 USD). Further, policy targets are required to possess an Aadhaar-linked bank account and a mobile number. The eligibility of policy targets is determined using algorithms that verify their identity. Meeting these criteria requires policy targets to enroll and interlink themselves using a common digital ID across multiple databases. Such a requirement imposes substantial barriers to policy compliance.

4.4. Policy Characteristics of Cooking Gas Cash Transfers

In the context of universal versus means-tested programs, some early studies have concluded that universal programs may enhance the incorporation and participation of recipients while means-tested programs were more likely to depress full citizenship and political engagement [56].

However, Bruch et al. [57] showed that Head Start, a means-tested program in America, increased engagement because it promoted participant involvement, whereas policies with a paternalistic design, such as the Temporary Assistance to Needy Families (TANF) program, discourage political and civic participation. This shows that the nature of the social construction of target populations is crucial for the success of sustainable energy transitions.

4.4.1. Size of Benefits

The size of welfare benefits has a direct bearing on the resource effects generated by a policy. Campbell [18] states that the large size of the benefits can enhance political participation. In the US, the large payments to retirees under the social security program were found to have facilitated income-driven political participatory acts such as campaign contributions. At the same time, programs such as the Temporary Assistance to Needy Families (TANF) offer low benefits, often leaving the beneficiaries below the poverty line.

At the early stages of the implementation of cooking gas cash transfers, there existed an indirect subsidy on the market price. Consequently, the cash transfer amount provided for the households as part of PAHAL was as low as INR 252 per cylinder (~3 USD). At that time, the media characterized the benefits that relatively better-off sections had to forego with the headline 'It's just one pizza that the government is denying you' [58].

In India, the indirect subsidy on the domestic cooking gas market price is gradually reduced over a prolonged time frame and eliminated. The market price of a gas cylinder was gradually increased to phase out the indirect subsidy. While this price increase has only affected the better-off households who pay the market price, the government provides cash transfers to poor households to partially defray the costs of purchasing a gas cylinder at the market price. As shown in Figure 4, the total domestic LPG subsidy has increased from INR 220 billion (~2.7 billion USD) in 2015–2016 to INR 326 billion (~4.1 billion USD) in 2020–2021.

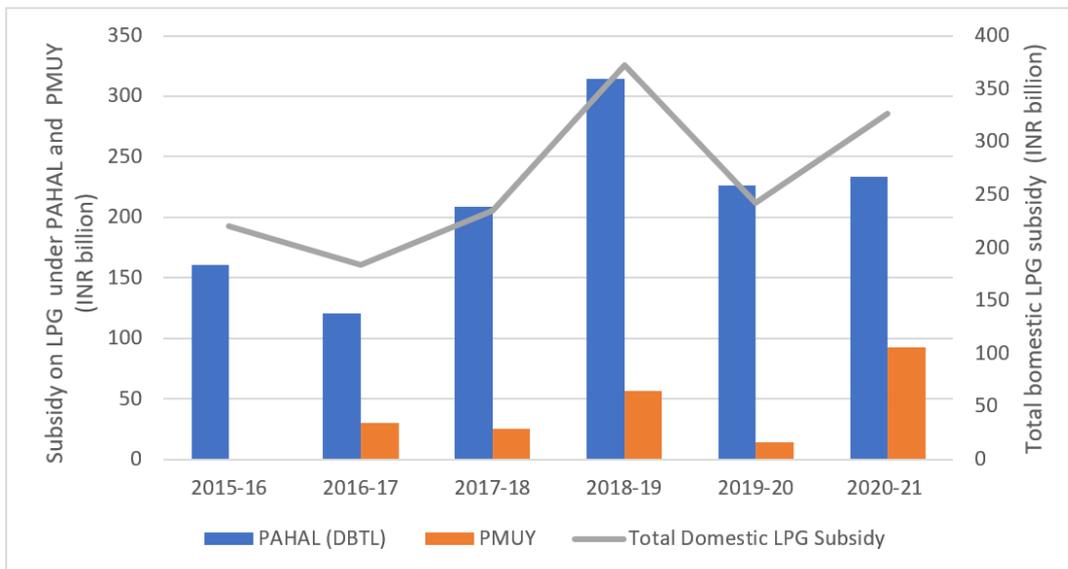


Figure 4. Fiscal subsidy on domestic LPG (in INR billion). Source: MoPNG, 2021.

4.4.2. Traceability/Visibility

This policy characteristic pertains to the fact that benefits that can be traced to the government are more likely to generate positive effects [59]. The vast publicity campaigns surrounding cooking gas cash transfers have increased the visibility of the benefits provided by India's central government. The Indian government issued 'certificates of recognition' and created a 'scroll of honor' to those who voluntarily gave up subsidies as part of the 'Give it Up' program. It also set up a website that showed the name of the poor persons who benefited from such acts of benevolence by the better-off citizens. These communicative governance practices have strengthened the policy legitimacy of the shift to DBT. The details about the amount of cash transfers provided to the individual policy targets relative to the market prices of LPG cooking gas are not easily accessible to the public, thereby making it difficult for those outside the government to assess the extent of welfare support. At the same time, the Indian government has spent vast sums of money on conducting information, education, and communication (IEC) activities for the promotion and release of PMUY connections as well as in organizing safety clinics/camps and LPG Panchayats to promote the safe usage of LPG (see Figure 5). The substantial investment on outreach activities has led to greater attribution of the policy benefits for the central government.

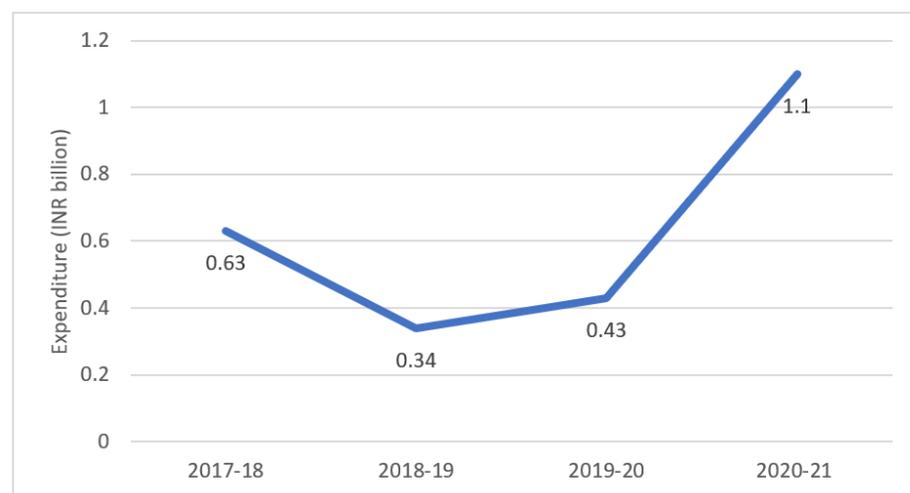


Figure 5. Expenditure (PME & IEC—Project Management Expenditure & Information Education and Communication) under PMUY (in INR billion). Source: MoPNG, 2021.

4.4.3. Proximity and Concentration/Diffusion of Beneficiaries

Geographically proximate beneficiaries “can more easily exchange information and band together for political action”, i.e., concentration, or vice versa, when those who are distant to each other may not believe the program is relevant for them, i.e., diffusion [18] (p. 340).

The Indian Prime Minister has organized regular virtual events to interact with program beneficiaries, where the health benefits of using cooking gas have been discussed and reinforced. Further, he organized a radio program called ‘*Mann ki Baat*’ (‘my thoughts’ in Hindi) in which, in the style of F.D. Roosevelt’s *Fireside Chats*, he communicates directly to the policy targets. At the grassroots level, local officials were asked to organize group events that coincided with these virtual broadcasts. These concerted efforts had contributed to the personalization of welfare programs, leading to a high level of attribution of a government policy to a central leader.

4.4.4. Duration of the Benefits

The Indian government has followed an approach of gradually and non-coercively weaning the relatively better-off sections from availing of cooking gas cash transfers. However, it ensured that the poor households who can meet the eligibility and documentary requirements are provided continued welfare support to defray the costs towards payment of the full market price of the gas cylinders. In doing so, they have created a new constituency of poor households who are protected from the deregulation of cooking gas prices.

4.4.5. Program Administration

Cooking gas is provided to customers through a network of cooking gas distributors. They work under the supervision of the public sector oil marketing companies (OMCs) that work under the policy direction of the Ministry of Petroleum and Natural Gas (MOPNG) of the central government. Unlike India’s Public Distribution System (PDS), which is operated by the state governments, cooking gas connections are considered a commercial service rather than a welfare benefit, and therefore marketed through the OMCs.

The shift to DBT has been accompanied by a substantial expansion of the cooking gas distribution network across rural India and the use of last mile service providers to expand access to bank services. The program administration is regularly monitored at the national level through meetings at the Prime Minister’s Office. These steps are key determinants in the successful expansion of the access to cooking gas connections and cash transfers. To realize this goal, the Indian government has expanded the LPG marketing infrastructure. Specifically, LPG distributors who supply the gas in rural areas have been increased, from 10,541 in 2011 to 25,083 in 2021, as shown in Figure 6.

India’s Public Distribution System (PDS), which is used to provide food rations to the citizens by the governments at the state level, is among the most common channel of welfare delivery. The sale of cooking gas canisters, however, is a market activity undertaken by the public sector oil marketing companies (OMCs) with a pan-India presence. The OMCs and the public sector banks that disburse cash transfers are directly under the control of the central government, thereby making it possible for the central government to initiate DBT reforms for energy subsidies pertaining to cooking gas without the full support of the government at the state level.

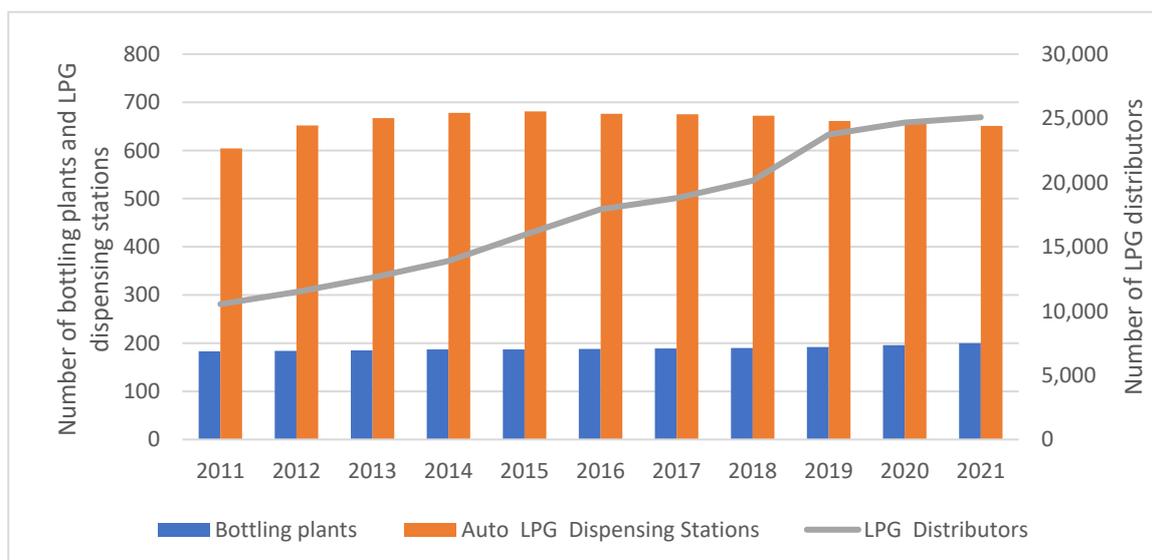


Figure 6. Growth in LPG market related infrastructure. Source: MoPNG, 2021.

5. Analysis and Discussion

Scholars have cautioned that the risk of decoupling emerges due to the increased opacity in the means–ends relationship [5] (p. 484). They attribute decoupling to the increase in the complexity of internal organizational structures, the perpetual state of reform, and the diversion of resources from the core goals. The shift to cooking gas cash transfers involves the risk of decoupling of the means (the efficient delivery of government subsidies) with the goal (the reduction of energy poverty). For this reason, care should be taken to ensure that the means are fully aligned with the pursuit of end goals.

Cooking gas cash transfers in India, which were initiated as a technocratic reform, have spurred the creation of new technological arrangements to give effect to digitalized welfare [60]. It enabled policy conversion, which as Hacker ([61], p. 46) characterized, involves “the deployment of existing policy levers in new ways, rather than the revision of those policies through normal procedures of collective political decision making”. The decade from 2004–2014 witnessed the embrace of a ‘social rights agenda’ by the United Progressive Alliance (UPA). In contrast, the period from 2009 onwards, when the Aadhaar initiative was launched, marked the “shift towards regulatory welfare state that applies and extends rule making, rule monitoring, and rule enforcement either directly or indirectly” with regard to welfare goals [62] (p. 608).

Digitalization and communicative governance are instrumental in facilitating the shift from a universal rights-based approach towards an approach of welfare targeting of particular social groups. The former Chief Economic Advisor of the Modi government had observed that the traditional welfare approach of the governments focused on the ‘supply of public goods such as basic health and primary education’. In contrast, he argued that the ‘new welfarism’ pioneered by the Modi government is ambivalent about the expansion of the social safety net. It focused on the ‘subsidised public provision of essential goods and services, normally provided by the private sector, such as bank accounts, cooking gas, toilets, electricity, housing, and more recently water and also plain cash’ [63].

Populism and communicative governance play an integral and complementary role in the implementation of these technocratic reforms. The National Democratic Alliance (NDA), headed by Prime Minister Narendra Modi, is widely credited with the effective implementation of the cooking gas cash transfers in India since 2015. Since then, the DBT mechanism has been expanded to many other policy areas. As elaborated in the previous section, the high level of personalization of policy implementation had transformed the *Ujjwala* program into a technopopulist intervention owing to the calibration of the key characteristics of policy design. The implementation of the cooking gas cash transfers was

carried out through government schemes rather than by enactment of primary legislation, thereby giving the government greater flexibility and less accountability to both the citizens and other stakeholders at lower levels of subsidiarity in India's federal polity.

In the context of Europe, Levy ([64], p. 240) theorized about the "vice into virtue approach" in which politicians target the vices in the existing welfare systems "to soften or obviate the supposedly ineluctable trade-offs between equity and efficiency". Even in the context of an expanding welfare state, the National Democratic Alliance under the leadership of the Prime Minister Narendra Modi had managed to affect a shift away from a universal approach to welfare by foregrounding the concerns about fiscal constraints and the need to direct public spending away from relatively better-off households to poor households. An effective media campaign orchestrating the public case for the relatively better-off sections to give up gas subsidies was launched, which declared that every connection they give up will be used to provide a new cooking gas connection to a poor family [65]. The concerted year-long 'Give it Up' campaign in 2015 led to more than 10 million customers (~5% of the active customer base) voluntarily giving up subsidies. Those numbers are significant in that they indicate a level of middle-class support for the policy of welfare targeting to achieve efficiency without sacrificing either social equity or effectiveness in reducing energy poverty.

Welfare targeting, in this case, is accomplished by socially constructing the better-off sections of the society as a group that voluntarily exited from a welfare program rather than by framing them as 'undeserving of benefits'. Such an approach has legitimized the expansion of the DBT mechanism to regulate access to more public services and welfare programs. The Indian Prime minister had also personalized the implementation of the *Ujjwala* program through speeches and publicity campaigns, thereby making credit attribution easier. For example, Chhibber and Verma ([66], p. 139), based on survey data from National Election Studies (NES) 2019, found that the *Ujjwala* program provided the highest credit attribution to the central government.

The communicative governance approach was effective in increasing credit attribution to India's central government at the expense of state governments. Foreseeing such a possibility, prior to the launch of the DBTL program in 2013, the then Chief Minister of the Indian State of Tamil Nadu had objected to the implementation framework arguing that the arrangements for DBTL violate 'a basic tenet of sound administration that authority, responsibility, and accountability have to be fused together at the same level to ensure effectiveness and efficiency' [67]. However, given that state government machinery has no direct role in the provision of subsidies for cooking gas, the concerns of the state government were not heeded. Since then, the expansion of DBT reforms to India's public distribution system has faced opposition from the state governments [68].

The available evidence thus far shows that the effectiveness of targeted welfare through DBT reforms is mixed. The early evaluation reports of DBTL reform have pointed out the high levels of administrative exclusion [69]. Although these concerns about exclusion have initially stalled the reform progress, subsequent evaluation reports commissioned directly by the government [50] and through external agencies [70] have been supportive of further expansion after suggesting several corrective steps. Despite such technocratic consensus behind cooking gas cash transfers reform, its effectiveness can be assessed only in terms of reduction in energy poverty in the long term.

Welfare targeting is accompanied by the decontrol of subsidized prices of cooking gas and subsequently, there has been a gradual calibrated increase in the market price of cooking gas cylinders since 2015. Early evidence shows that the high market prices have dampened the uptake of cooking gas cylinders. Evidence also shows that, on average, the *Ujjwala* program beneficiaries use only three cylinders (14.2 kg) a year, whereas the national average for LPG consumption is 6.3 cylinders (14.2 kg) (Figure 7).

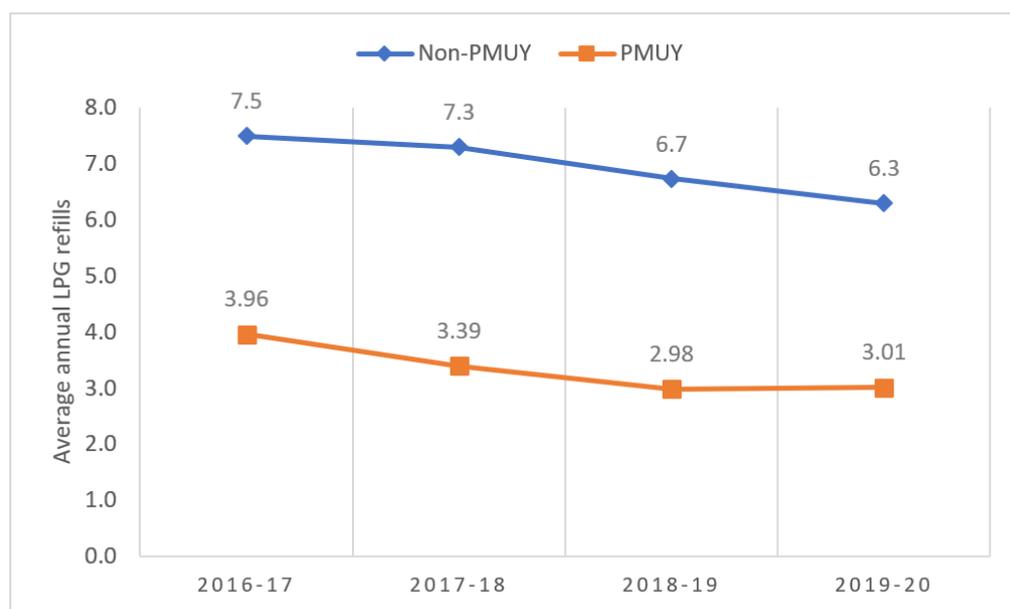


Figure 7. Average annual refill consumption for PMUY and non-PMUY consumers. Source: CAG, 2019 [71].

Further, the analysis of State/Union Territory (UT)-wise details of the number of consumers who opted for refill under the PMUY scheme indicates that 54.2% of total PMUY consumers consumed up to three cylinders in a year or more and 24.6% of beneficiaries never came back for a second refill (Figure 8). The states of Chhattisgarh, Jharkhand, Tripura, and Telangana have less than 40% of PMUY consumers who came for three or more refills. These data indicate that the use of digitalized welfare to advance sustainable energy transitions is not always an effective strategy. The reduction in LPG refill consumption shows waning resource effects of cooking gas cash transfers.

The early evidence also shows the limitations of the use of market mechanisms of price discovery and the efficacy of DBT or cash transfers in facilitating sustainable energy transitions. Despite the efforts of the Indian government, the distribution of banking network in India is still uneven, thereby affecting the ability of policy targets to access the benefits. In any case, the small size of the benefits is barely sufficient to overcome the challenges of energy poverty for many households. Although the barriers imposed by digitalized welfare disproportionately affect the most vulnerable social groups, considering that most of rural India still relies on solid fuels, there is considerable scope for expanding access to cooking gas. The central government's publicity campaigns, combined with cash transfers to facilitate affordable access to cooking gas, have provided a pathway out of energy poverty for many rural households. Because many additional rural households who were previously dependent on solid fuels now have access to welfare benefits, the negative feedback effects due to administrative burdens in policy implementation are somewhat attenuated.

Further, despite these challenges in facilitating sustainable energy transitions through digitalized welfare, it needs to be acknowledged that the state efforts towards the expansion of LPG distribution network and banking networks have made private merit goods such as cooking gas newly accessible to citizens and the economically backward states in India, especially in rural areas. For this reason, like in other developing countries with a weak state capacity [31], the expansion of cooking gas cash transfers has created positive policy feedback because it is 'better than nothing'.

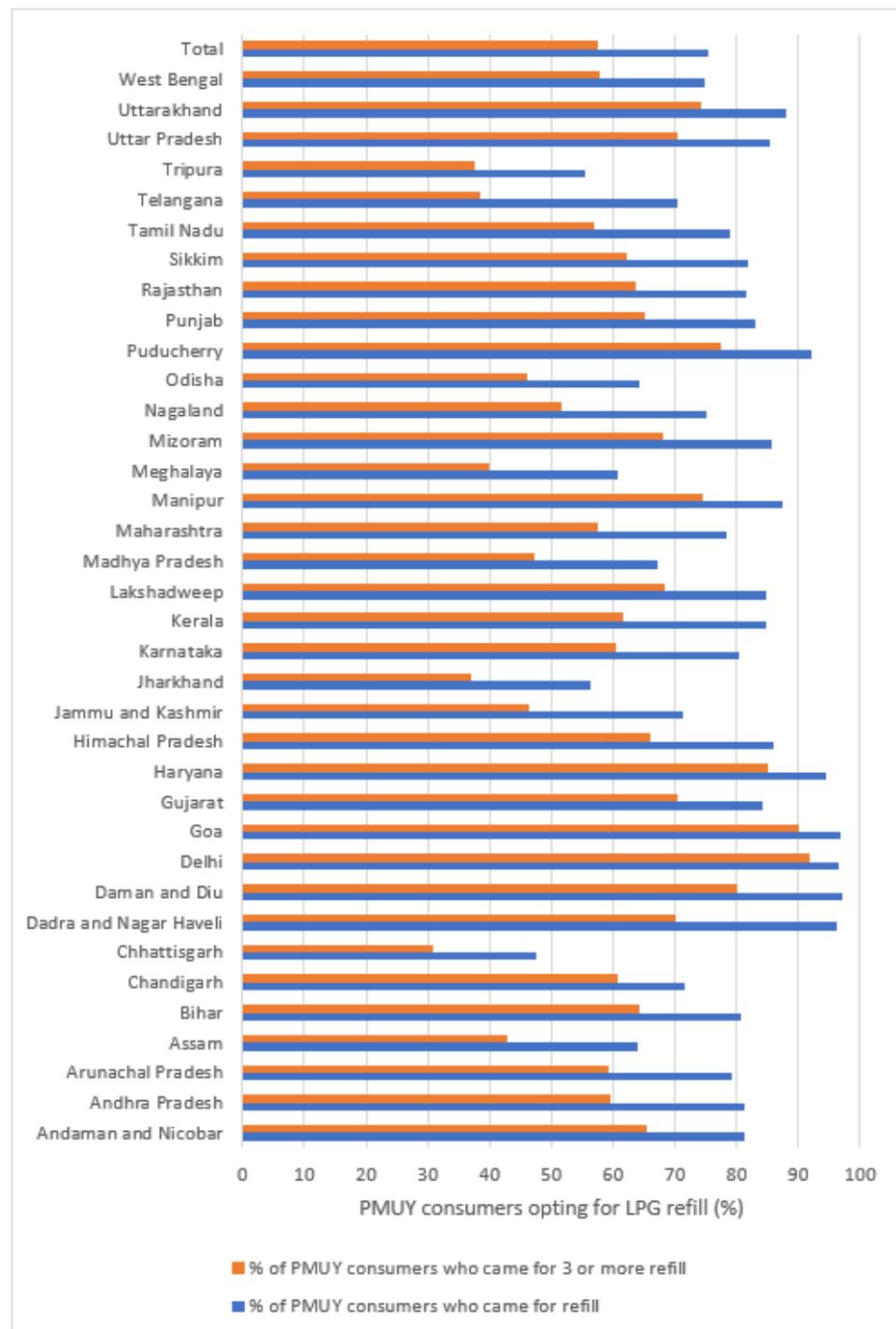


Figure 8. State/union territory-wise percentage of LPG consumers who opted for refill under the PMUY scheme. Source: PRS, 2021 [72].

However, there are several risks in the path to realizing sustainable energy transitions through digitalized welfare. Because digitalized welfare and the reform of energy subsidies are integral to larger macro-economic goals of fiscal management, governments must manage trade-offs between the efficient delivery of public and welfare services and the need to secure public values such as individual privacy and the minimization of harms to vulnerable groups. In the decade from 2012 to 2022, the Indian government had arguably prioritized the efficient delivery of welfare to the relative neglect of other public values such as equitable and reliable access to cooking gas. At the same time, the calibration of

policy design characteristics ensures public support for such technopopulistic policies. The lack of procedural justice and transparency has prompted criticism that citizens are being reduced from the holders of rights to ‘*labharthis*’ (beneficiaries in Hindi)—the receivers of government benefits through cash transfers. Critics suggest that such an approach turns active citizens who participate in the affairs of the state into passive subjects [73] who are beholden to a charitable state [74].

There is a shared technocratic consensus across academia, think tanks, and policy-makers concerning India’s shift towards a more centralized approach to welfare delivery. Such a view stems from a belief that politics at lower levels of subsidiarity is prone to politics, corruption, and electoral populism. Implicit in such a belief system is the faith the programmatic delivery through digitalized welfare creates opportunities for “upper-level politicians and parties to make their major welfare schemes more effective and then reap a larger share of the political benefit when they are effective by communicating directly with voters” [75] (p. 16). However, contrary to the claim that ‘new computer, smartphone, and universal ID technologies are reducing the incentives for political clientelism in the delivery of social programs in India’, a case could be made that the nature of political clientelism has been updated through digitalized welfare in India.

Digitalized welfare had made “individual programme recipients and voters legible and reachable to upper-level party officials—and persuadable by them—as never before” [75] (p. 16). This makes it possible to signal efficient implementation of public programs even as the programs themselves take on a more populist and clientelist character. Many state governments have now launched similar technopopulist interventions targeted at particular social groups by leveraging the ability of governments to micro-target voters [76].

In the long term, there is a risk that the goal of sustainable energy transition will be sidelined by technopopulism on the lines of Brazil. In Brazil, the “Auxílio Gás” program was launched in 2002 to provide a “gas allowance” for poor households through cash transfers towards cooking gas subsidies. The very next year, the program was integrated into one common program called “Bolsa Família”, as part of which households received one common conditional cash grant towards offsetting the costs of the poor towards school education, nutritional support, food security, and clean cooking gas [77]. As central and state governments embrace minimum income cash transfers, it is likely that, as in the case of Brazil, the removal of explicit gas allowances may ultimately lead to a decrease in consumption of cooking gas and a reversion to traditional solid fuel consumption [78] (p. 1092). These aspects need to be fully considered in assessing the further refining of the policy characteristics of the digitalized welfare delivery.

6. Conclusions

This article contributes to the knowledge base on sustainable energy transitions in several ways. Firstly, it foregrounds how the affordances of digitalization are deployed to calibrate the characteristics of policy design. Secondly, it elaborates how such a digitalized policy design can aid technopopulism in ways that decouple with the advancement of the sustainable energy transition goals. In doing so, it draws attention to the need for greater attention to how social actors shape the affordances of digital technologies in the context of public administration. Thirdly, it draws attention to how the characteristics of policy design shape the way policy feedback is generated in a weak state capacity context.

This article builds on the emerging body of scholarship on digitalized welfare [79], sustainable energy transitions [8], policy design [25], and policy feedback [18]. However, it has several limitations. This analysis of the operational dimensions of digitalized welfare is limited by the availability of data. For this reason, it mainly engages with the policy design aspects, based on publicly available information. As more data concerning reductions in energy poverty become available, future research can systematically study the effects of DBT on the use of cooking gas.

Despite these limitations, this is one of the first articles to engage with the design of digitalized welfare to facilitate sustainable energy transitions in India. Given the growing

centrality of digital IDs in welfare delivery, the policy analysis in this article is a useful guide to practice in other emerging democracies where digital IDs are now being used as part of efforts to move towards digitalized welfare. The insights into policy design in the digital era can contribute to a common body of knowledge about the best practices in using digitalized welfare to accomplish sustainable energy transitions.

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