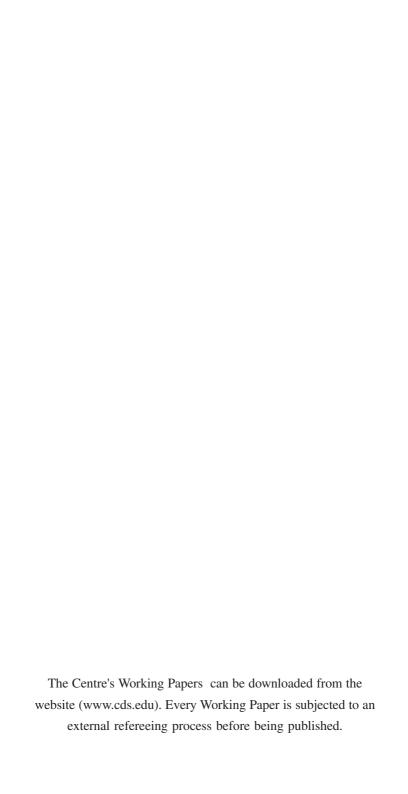# TRANSFORMING STATE-CITIZEN RELATIONS IN FOOD SECURITY SCHEMES:
THE COMPUTERIZED RATION CARD MANAGEMENT SYSTEM IN KERALA

Silvia Masiero

TRANSFORMING STATE-CITIZEN RELATIONS IN FOOD SECURITY SCHEMES: THE COMPUTERIZED RATION CARD MANAGEMENT SYSTEM IN KERALA

Silvia Masiero

December   2012

ABSTRACT

In this paper we look at the application of ICTs to the improvement of state-citizen relations in a developing country context. Our argument is that, to maximise responsiveness of the government, ICTs need to target the structural problems in state-citizen relations, from which unresponsiveness of the state to citizens is generated. Failure, as portrayed here, arises from the fact that ICTs, rather than being used for tackling the causes of issues in government responsiveness, tend to be conceived and utilised primarily as a means for acquiring political consensus. This argument is illustrated through a case study of computerisation of the ration card procedure in the southern Indian state of Kerala, where a typical problem of state unresponsiveness – mirrored by a burgeoning amount of unattended ration card applications – is matched by a typical e-government solution, i.e. digitalisation of the process of document release. Our case study reveals that, while the structural problems of the process of ration card delivery in Kerala lie within two crucial nodes, namely poverty status determination and verification of applications, the digital solution devised by the government addresses predominantly the front-end, politically appealing node constituted by citizen application for a ration card. This strategy, which leaves untouched the crucial nodes of state unresponsiveness, turns out in citizen dissatisfaction on the long run. Implications are both theoretical, as a cause for failure is identified and deconstructed in the domain of ICT4D, and practical, as an orientation to structural problems is recommended for policymakers that engage in ICT-based government reform.

Keywords: e-governance; food security; public distribution system; ration card; computerization; Kerala

JEl Classification: O20, O33; O38

Introduction

Information and communication technologies (ICTs) have been plied to a plethora of objectives, among which the construction of a better government, that maximizes the state's capacity of serving its citizens through the public sphere, is paramount. Many scholars (see, for example, Heeks 2001; Chadwick and May 2003; Bhatnagar 2004; Dunleavy et al. 2006; Bekkers and Homburg 2007) focus on the multiple ways in which digital technologies can act as instruments of government amelioration, as they enhance effectiveness and accountability in the framework of public service provision. The logic behind this argument is powerfully stated by Bovens and Zouridis (2002): by automating the interaction between public officers and recipients, ICTs remove the discretional power retained by street-level bureaucrats, and are, therefore, instrumental in eliminating the inefficiencies and leakages derived by the human management of this relation. This idea, over the last decades, has been largely applied to the domain of less-developed countries (LDCs), characterised, in general lines, by the challenges of institutional frailty and flawed accountability structures between the state and its citizens (Chambers 1997; Brett 2003; World Bank 2004).

In this paper we look, indeed, at the application of ICTs to the improvement of state-citizen relations in a developing country context. Our investigation starts from the idea of *governmental technologies* stated by Rose and Miller (2010), according to which problematics of government are to be analysed not just in light of the political rationalities behind them, but also in terms of the technologies of rule through which

these rationalities are enacted. Grounding our work on a contextualist approach we observe, with Corbridge et al. (2003a, 2003b, 2005), that the key dimension to create well-functioning technologies of rule, in the Indian institutional setting, lies in enhancing the capacity for citizens to "see the state", i.e. properly access it for satisfying their needs and solving their problems. In our view, achieving this dimension implies maximizing the *responsiveness* of the state to citizens: which means, optimising the capacity of the state to match the requests of citizens with proper responses, in a timely manner, without hidden costs.

Our argument is that, to maximise responsiveness of the government, ICTs need to target the structural problems in state-citizen relations, from which unresponsiveness of the state to citizens is generated. Failure in this field arises, in our view, from the fact that the solution to structural problems, affecting interaction between the state and citizens, is not necessarily a politically appealing objective, whereas ICTs tend to be conceived primarily as a means for acquiring political consensus. Mistargeting of ICT policies, towards politically popular objectives and away from structural problems, lies at the root of citizen dissatisfaction with ruling powers on the long run, and prevents ICTs from achieving the objective of a better government for those in need.[1]

To demonstrate this thesis, we focus on an information system devised by the government of Kerala, southern India, to deliver ration

---

1   Throughout the paper, we use the semantic domain of "structure" of state-citizen relations, to mean the underlying essence of these interactions – which is constitutive to them, and does not change with contingencies. In doing so, we rely on the conceptualisation of Kooiman (2003: 30-32), who classifies interactions according to two levels: an "intentional" one, which is predicated upon the specific circumstances in which people interface with each other, and indeed a "structural" one, that depends on the nature of interactions, and speaks about the way in which they systematically occur. As noted here, our focus is on structural issues between the state and its citizens: in practice, this indicates a set of problems whose solution is paramount, not just to solve difficult situations on a contingency basis, but to deal with the issues that lie at the root of government malfunctioning.

cards to citizens. A ration card is the document needed, in all India, to access subsidised food and supplies under the Public Distribution System (PDS), the biggest anti-poverty programme of the whole nation. In designing and implementing this digital system, the government of Kerala has invested on automatising front-end services, but it emerges from our work that structural problems, with ration card delivery, lie at other levels: firstly, they are embedded in the determination of poverty status of households, as this is carried out entirely to the discretionality of street-level officials. Secondly, problems are deeply ingrained in application management, because the verification process that precedes delivery is still awkwardly designed and untouched by automatization. The consequence is that citizens are, by and large, dissatisfied with the application in point, because the government, instead of using ICTs for addressing structural problems, has focused on a politically appealing objective, namely amelioration of a single, front-end component of the process.

Implications of our argument arise at two macro-levels. In the domain of theory, having noted that the field of ICT4D focuses more on the consequences of failure than on its roots (Heeks 2006), we deepen the analysis of a likely cause for failure, namely the usage of ICTs for targeting politically attractive objectives rather than structural problems. This thesis confirms, furthermore, the argument of Avgerou (2001, 2004), according to which technological innovation needs to be associated with its context of action: indeed, every single context is characterized by its own structural problems, for which specific information systems are to be designed and implemented. In the domain of practice, operational suggestions are elaborated for policymakers and technology professionals in the LDCs: if problems in state-citizens interactions are to be solved, politically popular moves should be relegated to a secondary level of relevance, while the elaboration of solutions to structural problems needs to be set as the primary objective of ICT usage.

This paper is structured as follows. First, we review the three domains at the basis of our work, namely those of e-government, ICT4D, and the use of ICTs to improve state-citizen relations in the LDCs. From insights in this review we extract our theoretical perspective, based on the use of ICTs for producing government technologies that enable fruitful encounters between the state and its citizens. Then, we look at the Keralite experience with TETRAPDS-RCMS, an information system which, by computerising the procedure for obtaining a ration card, arises as a paradigm of technology usage for maximising responsiveness of the state to disadvantaged citizens. In our discussion of the case, we deconstruct the procedure behind ration card delivery, and the role of technology at each stage of this process: it emerges that, while application for a new ration card has been fully computerised in Kerala, TETRAPDS-RCMS has been unable to target the structural nodes of the process, i.e. the determination of poverty status and the verification of applications. We conclude, therefore, by remarking the contribution of this case to theory, as a cause for failure is identified and deconstructed in the domain of ICT4D, and to practice, as an orientation to structural problems is recommended for policymakers that engage in ICT-based government reform.

E-Governance and Development: A Theoretical Perspective

In this paper, we look at the usage of ICTs in a specific domain, i.e. the improvement of state-citizen relations in a developing country context. To lay out the theoretical ground for our assertions, we need to review three spheres of literature, regarding, respectively, ICT as a state-citizen mediator, ICT as a development maker, and ICT as a maker of "good government" in the LDCs. The underlying assumptions on which our research is grounded will be identified in each of these domains.

ICT as a State-Citizen Mediator

The vision of ICT as a mediator, in the multiple relations between the state and its citizens, is at the basis of the broad field of study which

is subsumed under the name of e-government. In this field, of which Heeks and Bailur (2007) provide a comprehensive literature review, academic work proliferates, and studies look mostly at the practicalities of informatisation in the public sphere. But, as noted by the same authors (2007: 260), the field is largely flawed by its a-theoretical nature: indeed, most pieces in e-government outlets do not clarify the epistemology underpinning their arguments, nor the definitions of concepts utilised across the elaboration of ideas. Hence, more work is needed in terms of identifying the meaning of theoretical constructs, out of which e-government pieces are elaborated and devised.

This consideration holds, in particular, for the key concepts in this domain, among which the idea of "good government" is paramount: papers in e-government, indeed, differ largely in the degree of precision with which the idea of "good government" is operationally defined. As noted by Cordella (2007), the field is increasingly pervaded by an underlying postulation, that equates the objectives of governments with those of organisations operating in the private sector. This is, by and large, a consequence of the emergence of New Public Management (NPM), a philosophy that aims to ameliorate public administrations along the guidelines of the private sector (Hood 1991; Osborne and Gaebler 1992): a whole stream of literature assumes, without problematising this idea, that ICTs constitute a mere instrument at the service of NPM, finalised to dismiss the inefficiency implicit in the heavy fabric of bureaucracy. Having noted this tendency, Cordella (2007: 266) problematizes this conception at its very basis, identifying the bureaucratic organisation as the only real guarantor of equity and impartiality in the public sphere: hence, ICTs should be used to purport the values implicit in bureaucracy, not to reform the public sector along the shape of private organisations.

From the work of Cordella, our research takes up a paramount assertion: given the deep, inherent differences between the public and

the private sector, the objectives of the public machine are to be seen as specific, and should not be equated to those that private organisations set up for themselves. On the one hand, private organisations belong to the domain of the market, and lead their existence with the purpose of maximising the profits that they generate. As remarked by Ciborra (2005: 263), the mechanisms regulating the market are inherently different from those acting at the state level, for at least two reasons: first, the market is made out of a plethora of organisations, among which customers can shift according to the quality of services provided. Nothing similar happens with the state, which often monopolises the sets of services that it offers. Secondly, the behaviour of private organisations is reflected by variations in the prices of services, something that the state – due to its propensity towards a monopolistic position – does not contemplate in its interaction with citizens.

On the other hand, government organisations want to generate *public value* for the local communities in which they are inscribed (Cordella and Willcocks 2010), not private profits for the individuals that invest in them. To identify key objectives in the public sphere, we rely primarily on the work of Unsworth (2005: 10): in her view, the pursuit of good government implies striking a balance between *effectiveness* in state control and capacity to act, and *accountability* of the state for its actions. Hence, it is not enough for governments to serve citizens promptly, but mechanisms should be in place for public administrations to become reliable, and for responsibility for actions to be traced back to the specific officers who performed them. Starting from this idea, a plethora of studies has focused on the ways in which ICTs can be plied to this purpose: namely, creating a better government, oriented to the simultaneous pursuit of internal effectiveness and accountability to recipients.

How can ICTs guarantee the pursuit of these objectives, and become, by doing so, a valuable mediator between the state and citizens?

The main mechanism at work here coincides, in our view, with automatization, as it is outlined in the work of Bovens and Zouridis (2002). As these authors observe, ICTs allow the public machine to make the transition from the form of street-level bureaucracy, in which officers enjoy a high degree of discretional power, to that of system-level bureaucracy, where automatised processes constrain the action of human clerks. This transition, obtained through digital technologies, allows for the law to be perfectly implemented: the underlying assumption, in this respect, is that the root of government malfunctioning lies in the discretionality of paper-based processes, which allows for delays in operations and for malpractice due to the pursuit of the officers' personal interest. The capacity of ICTs to automatise processes, thereby infusing effectiveness and accountability in the public sphere, is at the root of the rationale that underlies the field of e-government in its entirety.

Our starting point, therefore, is that, for government processes to work properly, non-discretional mechanisms of interaction should be enabled between citizens and the state bureaucracy. To operationalise this idea, we ground on the theorisation by Rose and Miller (2010: 174): according to them, problematics of government are to be analyzed not only in terms of political rationalities, but also in the light of their governmental technologies, i.e. the mechanisms through which authorities seek to give effect to governmental ambitions. These technologies, by their very nature, enable spaces of interaction between citizens and the bureaucracy: ICTs, as they can make procedures work by automatisation, can create fruitful encounters at the state-citizen level. This leads us to spell out the main assumptions on e-government, on which our research in this paper is grounded: first, "good government" is operationally equated with a public sphere that pursues not just effectiveness, but also accountability to the citizens. Second, to enable the pursuit of "good government", ICTs need to enable powerful technologies of rule, in which automatisation produces equal and fruitful encounters at the state-citizen level.

ICT as a Development Maker

If the field of e-government is the subject of proliferating academic work, the field of ICT for development (ICT4D), in which digital technologies are conceptualized as potential or actual agents of development, is also the focus of a burgeoning amount of literature. Our reading of ICT4D draws on the domain of Information Systems (IS), and is therefore concerned with IS research conducted with respect to developing countries: this domain is powerfully captured by several literature reviews, primarily those from Walsham and Sahay (2006) and Avgerou (2008). The former is essentially concerned with addressing key challenges in the field, revolving in particular around the role of technology in managing the processes of the development sector. In the latter, the focus is more on the discourses through which the field of ICT4D is treated: literature is classified into three macro-discourses, as technology-based intervention is seen, respectively, as a process of knowledge transfer, as socially embedded action, and as a route to techno-organisational transformation.

The late 1990s have witnessed the rapid diffusion of enthusiasm towards ICTs, in their newly-acquired role as a development agent to improve quality of life in the LDCs. The World Development Report 1998/99, one of the first programmatic documents in this respect, asserts that knowledge lies at the heart of economic prosperity: consequently, problems affecting the LDCs are to be sought primarily in informational asymmetries, which can potentially be solved by the implementation of proper ICT infrastructures (World Bank 1999: 7-18). Similarly, the Human Development Report 2001, programmatically entitled "Making New Technologies Work for Human Development", spells out the benefits of informatisation for the developing world: these are largely ascribed to the open configuration of ICTs, that should lead to participation of people in the direct management of their own development (UNDP 2001: 36-38). These lines of reasoning, taken to their extreme, have led

to the onset of a deterministic conception, that views ICTs as a sort of panacea for the totality of problems afflicting the poor and disadvantaged that inhabit the developing world.

Yet, over time, ICT4D has become increasingly preoccupied with failure. As noted by Avgerou and Walsham (2000), after the initial big spurt of determinism, work has started to proliferate around cases where ICT implementation has turned into costly investments, with little or no return in terms of development outcomes. The increasing pervasiveness of failure in the field is powerfully summarised by Heeks (2005: 3), when he notes that, in the arena of ICT4D, "at least one-third of such projects are total failures and one-half are partial failures": success, in the reality of facts, seems to be linked more to positive conjunctures than to a mechanistic rule. The contrast between deterministic theories, and the increasing prevalence of failure empirically observed on the field, has generated the onset of a wave of skepticism that pervades the whole domain of ICT4D.

This skepticism, grounded in actual experiences of failure, is paralleled by another wave of skeptical accounts, whose root is grounded, conversely, in a more theoretical line of reasoning. The philosophy guiding this view starts from an extreme conception on the discourse that Avgerou (2008) qualifies as knowledge transfer: more specifically, the pursuit of this objective through ICT4D is equated to outright imposition of Western cultural systems over recipients in the developing world. A key proponent of this type of skepticism is Dagron (2001), who purports telecentres, otherwise conceptualised as a basic means for social inclusion through ICTs (see for example Oestmann and Dymond 2001 and Madon 2009), in terms of a tool for imposing Western knowledge over the LDCs, whereas local knowledge is dismissed as ignorance. Another, radical proponent of outright theoretical skepticism is Wade (2002): in his view, not only are ICTs unable, *per se*, to generate and sustain positive development outcomes, but they are configured as

the key instrument of a "new form of dependency" for the developing world, in which LDCs are forced to adapt to the standards set out by providers in the industrialised nations.

As we structure our perspective in this research, we are implicitly called to spell out our theoretical position in the domain of ICT4D. In our view, analyses in this field should go beyond deterministic visions, in terms of both over-enthusiasm and outright skepticism on the developmental potential of digital technologies. Our point of view conforms, instead, to the critic set out by Avgerou (2003), against the tool-and-effect view that automatically links ICT adoption in the LDCs with outright success or failure. It is our vision that success depends, instead, on the coherence of specific information systems with the context of action in which they are proposed: ICTs should act, consequently, as generators of locally relevant content for their recipients, in order to solve the specific type of problems that each particular environment presents (Madon 2005). Hence, our position is one that "suspends the judgement" on the general effect of ICTs on development, and prefers to examine *specific* information systems, embedded in *specific* contexts, by tracing the mechanisms that flow from adoption of technology to development effects.

Finally, a problematic point affecting the field of ICT4D should be observed. Indeed, despite the high and increasing preoccupation with failure in this domain, causes of failure in ICT-based intervention are not conceptualised in a clear and systematic way. It is true that, in this academic arena, the *consequences* of failure are examined through several prisms, including waste of economic resources (Heeks 2005), incapacity of generating social inclusion through ICTs (Mercer 2006), and systematic dismission of local knowledge in technology-based interventions (Dagron 2001). Yet, as observed by Heeks (2006: 125), the field lacks a good conceptual foundation for analyzing the *causes* of failure: anectodal evidence in this respect prevails, and reflection on

the roots of negative experiences is ultimately neglected and overlooked. This piece, by closely observing the mechanisms that link specific decisions in ICT adoption to specific development outcomes, aims to concentrate on the level of causal linkages, and wants to act in terms of fostering reflection in this scarcely analyzed component of ICT4D.

Before continuing to develop our theoretical perspective, a self-critical reflection should be carried out here, in terms of the extent to which we are identifying the role of government with that of a sheer provider of services, with the risk of neglecting the other paramount functions that governments make in the contemporary world. To broaden our perspective in this respect, the stream of thought on e-government that finds its highest expression in the work of Ciborra (2005) is referred to here, as a critical *memento* of the values of fairness, equality and justice that a well-functioning government should be able to enhance: e-government should be, indeed, the ICT-enabled route to translating these values into reality, not merely a carrier of higher technical efficiency. Inscribed in this tradition, the work of Kahn (1997) makes an important contribution to our reflection, as it states that the idea of "good governance" goes very much beyond guaranteeing the efficiency of government processes: "good governance" implies, indeed, capability of the state to abandon the "minimised" role to which NPM confines it, and proactively intervene to restore healthy functioning of market and non-market process when needed. Therefore, as we proceed in the construction of our theoretical vision, we will bear in mind that, despite the importance of the role of service provision as performed by governments, this role needs to be viewed in the context created and reshaped by the values attached to governance.

ICT as a Maker of "Good Government" in Developing Countries

Having briefly reviewed, in a separate fashion, the two spheres of e-government and ICT4D, we now come to consider the sphere resulting from the intersection of these, i.e. the study of ICT for improving

mechanisms of government in developing countries: it is, indeed, in this field of investigation that our research is inscribed. If, as noted above, ICTs can act as a mediator for improving the multiple relations between the state and citizens, the ways in which this can happen in the specific settings provided by the developing world is to be explored in detail. In LDCs, on a general basis, the problems of institutional frailty and flawed accountability structures affect the whole fabric of state-citizen relations (Chambers 1997; Brett 2003; World Bank 2004), and pose a specific set of challenges in terms of intervention.

Our point of departure, in analysing this sphere, is that of Avgerou (2001, 2004), according to which it is fundamental, for IS research, to associate technology innovation with the context in which it is embedded. The key implication of this approach, for our research, is that the idea of "good government", spelled out above in its general terms, should be defined with specific respect to the context of analysis, provided in our work by a state in southern India. Above, we have identified "good government" as a balanced combination, stemming from the pursuit of internal effectiveness and accountability of the public sphere to citizens: these concepts, while widely utilized in the literature, are rarely unpacked in their constituting dimensions, and rarely are they examined in relation to the actual context in which developmental action is observed. To unpack the idea of "good government" with respect to India, we rely on the approach set out by Corbridge et al. (2005: 6-18): this account identifies good government with the possibility for citizens to "see the state" in a better way, that means, accessing governmental provisions in an equal and frequent manner.

The idea of "seeing the state", elaborated with specific reference to India, relies on a system of institutional characteristics that are specifically proper of this nation. In the heavy fabric of Indian bureaucracy, interaction between citizens and the central government is problematic not only due to the widespread marginalisation of the

disadvantaged (Ahuja and Chhibber 2006), but also to the complexity of the structure of government, where central provisions are mediated by the pervasive influence of state-level administrations (Dasgupta 2001; Mitra 2001). Greater accountability was pursued, in the 1990s, by the provisions of the so-called Panchayati Raj reforms, centred on the devolution of power at the level of districts, blocks and panchayats (villages), local bodies that should be better equipped to deal with the immediate needs of citizens. And still, as reported by several authors (see for example Corbridge et al. 2003a, 2003b, 2005; Bardhan and Mookherjee 2004; Kochar 2008), lacking capacity of accessing government arises perhaps as the main problem of contemporary India, perpetuating the issues of a poor quality of life. Encounters with the state systematically turn out into frustrating experiences, especially for the poor and disadvantaged: people can be left for hours waiting outside a public office, just to be attended by time-pressed and unwilling bureaucrats, or not to be attended at all. As we engage with observing ICTs for state-citizen relations in the Indian context, we need to keep these specificities into account: as a result we postulate that, in our case, a better government is a government that maximises its *responsiveness* to the citizens, i.e. that responds to their requests in a prompt and timely manner, without hidden costs.

This leads us, in terms of our theoretical perspective, to further deconstruct the idea of *governmental technologies* on which our vision of e-government is grounded. As we have examined the field of e-government in general, we have sustained that these technologies, by their very nature, are made to enable spaces of interaction between citizens and the bureaucracy: ICTs, the logic goes, are able to make these encounters more fruitful, as they can infuse effectiveness and accountability in the public sphere through automatization. In our context of analysis, constituted by the frailty and complexity of Indian institutions, we postulate that a good technology of rule is one that allows citizens to better "see the state", i.e. that maximizes responsiveness

of the government to the citizens in the terms outlined above. Therefore, our purpose in this work is that of shedding light on the mechanisms that flow from ICT adoption to better governmental technologies, conceived as technologies that are able to optimize state-citizen relations, by attacking the institutional problems that can possibly paralize them.

To sum up, our assumptions in the sphere of ICT as a potential improver of government in LDCs are as follows. Our work is grounded on a contextualist approach, according to which concepts, rather than existing in a vacuum, are to be analysed with specific reference to the context of action in which they are embedded. Consequently, our idea of "good government" does not stand out in general terms, but is conceptualized with specific reference to India, whose core problem is identified as lacking capacity of citizens to "see the state" in equal terms. As a result, our idea of "good government" coincides with a government that can maximize responsiveness of the state to its citizens, especially the poor and disadvantaged. As noted above, ICTs arise as potential actors in the improvement of this responsiveness, due to capacity of automatizing state-citizen relationships: the artefact at the centre of our case study, designed and implemented in a state in southern India, has been conceived exactly for this purpose.

Methodology

In this paper, we look at the mechanisms flowing from adoption of an information system to changes in the responsiveness of the state to its citizens. To do so, we rely on a single case study, a method grounded on the richness of thick description, and that applies to situations, such as the one that we are examining, where the boundaries between case and context are not clearly defined (Yin 2001). In our theoretical approach, concepts are examined with specific reference to the context in which they are inscribed: this constitutes a further motivation to explore the phenomenon in its natural setting, as the case study method

allows to do (Benbasat et al. 1987). Our case study can be viewed as a typical one, as its content is paradigmatic in two different respects: in terms of the problem, which qualifies a typical situation of non-responsiveness of the state to its citizens, and in terms of the solution, in which digital technologies are utilized in order to tackle the problem of unresponsiveness on the side of government.

The context for the case is provided by the Indian state of Kerala. In this state, as well as in all India, access to the Public Distribution System or PDS (the principal anti-poverty scheme of the nation, a description of which is provided in the following section), is conditional to ownership of a document known under the name of *ration card*. Here, unresponsiveness of the state is mirrored by the fact that, as of August 2010, 600 thousands ration card applications were left unattended in Kerala: this means that, as a result of government inaction, 600 thousands of families were rendered unable to benefit from an anti-poverty net of crucial importance. The solution devised by the government relies on TETRAPDS-RCMS, an information system that has computerized the whole procedure for obtaining a ration card: digitalisation was supposed to make it possible, for the government, to match the requests of citizens with prompt and timely delivery of the document. Our case study consists of an in-depth investigation of the network of actors revolving around TETRAPDS-RCMS: reliance on the tenets of actor-network theory is motivated by the fact that this theory, differently from simple stakeholder-based approaches, offers an explicit way to conceive technology itself as an "actor" belonging to the actor network (Walsham and Sahay 2006: 12).

The study of the actor network centred on TETRAPDS-RCMS has involved a six-month period of permanence on the field: we were based in Trivandrum, the capital city of Kerala, a strategic location for accessing both the National Informatics Centre (NIC) where TETRAPDS-RCMS has been designed, and the Department of Food and Civil Supplies

that constitutes the principal user of the programme. The actual fieldwork was carried out by the first author, with the supervision and guidance of the second author. In the initial stage of fieldwork, the actor network has been divided in three macro-areas: software developers, who are in charge of designing and updating the information system; government officials, who utilise the software at its diverse levels of action; and citizens, who constitute the final users of the programme. Subsequently, we have engaged in diverse forms of investigation of each component in the actor network, more specifically:

• Interaction with software developers has consisted of five demonstration sessions on the diverse components of TETRAPDS-RCMS, each of which lasting between 30 and 90 minutes, followed by questions from the researcher. Demonstration sessions have been complemented by in-depth interviews, with those who materially engaged with software design and implementation, as well as with those retaining decisional power at NIC Kerala.

• Government officials have been approached at two levels: firstly, at the level of the Department of Food and Civil Supplies, where the central applications of TETRAPDS-RCMS are located and managed; secondly, at the level of Taluk Supply Offices, which constitute the interface between the Department of Food and Civil Supplies and citizens. Out of 70 Taluk Supply Offices in Kerala, 7 have been the object of participant observation, focused on grasping the modes of interaction of officers with the technology embodied by TETRAPDS-RCMS. Observation has been complemented by in-depth interviews at both levels, which in most cases were mediated by a translator.

• Citizens have been studied primarily in two aspects of their relation with TETRAPDS-RCMS: firstly, in the telecentres where application for a ration card is performed, and secondly, in the

ration shops where goods under the PDS are supplied. Participant observation has been carried out in both settings, encompassing 3 cities and 8 rural villages. This has been also complemented by in-depth interviews, which were, except in a few cases, mediated by a translator.

Furthermore, primary research has been complemented by encyclopaedic insights on anti-poverty programmes, especially as far as the peculiarities implicit in the Indian context are concerned, and on the usage of digital technologies in these toolkits for poverty reduction. The purpose of this research design is that of fully understanding the network of actors around TETRAPDS-RCMS: as of Avgerou (2001: 5), adoption of this perspective results in the researcher's capability of overcoming dichotomic juxtaposition between the technical and the social domain. Instead, focus is on mechanisms that link technicality to socially oriented outcomes, in this case conceptualised in terms of change of the relations between the state and citizens.

Mechanisms, as they flow from ICT adoption to state-citizen relations, are the key unit of analysis on which we have focused. As of Sayer (1999), our attention towards the causal relations underlying processes, rather than mere observation of phenomena at the surface, is typical of a critical realist mode of research. As noted by Sismondo (1993: 535) and Crotty (1998: 12), a critical realist ontology, as the one displayed here, is compatible with a cautiously constructivist epistemology: in effect, we believe that the meaning of things is not something pre-existent, waiting to be *discovered* by human beings, but it is proactively *constructed* by them in their encounters with reality. Caution in our constructivism stems from the fact that, as of Crotty (1998: 52), we hold that construction of meaning does not start from scratch: it is not a process of creation *ex novo*, but a procedure of construction in which agents make use of a set of existing building blocks, determined by the social *matrix* constituting the milieu of

individuals (Hacking 1999: 10). This is, in fact, the constructivist idea at the basis of our work, and, given the caution induced by recognition of a social matrix in the production of concepts, we can assert that this epistemology is compatible with a focus on mechanisms which is, *per se*, more proper of critical realism.

Case Study

Our case study is centred on TETRAPDS-RCMS, an information system that computerises the whole procedure through which the government of Kerala releases ration cards to citizens. First of all, the context in which our technological object is developed will be spelled out, highlighting the features of the Kerala society that have made it conducive to computerisation of the PDS, i.e. the biggest and most important anti-poverty scheme in the nation. Ration cards, as we will see below, are crucial for several purposes, but in particular they are compulsorily required for accessing the PDS. Having reviewed the guidelines of this programme, we will look at the way in which TETRAPDS-RCMS aims to meet the challenge posed by a burgeoning amount of unattended ration card applications.

Kerala – Development Paradox and the Rise of Civil Society

As of its *sui generis* combination of high levels of social development, particularly as far as literacy and life expectancy indicators are concerned, with low GDP and capital accumulation, the southern Indian state of Kerala is often referred to as a "development paradox" (Chopra 1982; Subrahmanian 1990; Gopakumar 2007). Indeed, the extent to which this combination may be beneficial to the quality of life of citizens is, by and large, debated upon by scholars: Parayil (2000), on the one side, asserts that the development model of Kerala is not, in itself, a paradox, but simply a phenomenological demonstration of an alternative route to development, that differs remarkably from the neoliberal approach. Diversely, other critics hold that excessive attention

to policies of redistribution, coupled with an attitude that tends to distrust market mechanisms and private investments, has systematically prevented economic growth in the state (Prakash 2004), and depleted entrepreneurial capabilities among the Keralites (Tharamangalam 1998).

Be it as it may, it is out of doubt that the development history of Kerala is unique in the composite landscape of post-Independence India, and that the capability of the Communist Party of India (CPI) to build a strong electoral basis, maintaining it (albeit with numeric variations) throughout the decades, has influenced the development trajectory of the state in a significant way. In a country where the transition to capitalism has been shaped as a "passive revolution", lacking the direct mobilisation of popular masses (Chatterjee 1986), Kerala has witnessed what can be referred to as a socio-economic transition from below: it was, indeed, the direct class agency of rural peasants that played the most important role in subverting the feudal relations of production (Heller 1995). These historical dynamics are, by and large, at the root of the present development outcomes: whereas collective, sustained public action has led to higher levels of human empowerment, the governmental propensity towards capital redistribution over accumulation has obstructed the way to sustained economic growth, or at least, it has rendered that way more difficult to go through.

The decision, historically adopted by Kerala governments, of promoting strong political awareness as a tool for human development has created a positive environment for the Panchayati Raj, the reform of the Indian constitution that aims to utilise administrative and financial decentralisation as means for allowing citizens to experience empowerment concretely in their daily lives. This reform has been taken very seriously in Kerala, in such a way that very high levels of fiscal and administrative responsibility have been delegated to the Gram Panchayats: this has constituted another move in the direction of empowering citizens, and proactively locating them at the centre of

decision-making for their lives. At present, community life in Kerala is deeply articulated by the presence of political mechanisms of collective action, at both the urban and the rural level, and this makes programmes and measures for attacking poverty a primary concern not only for the state, but for the population considered as a whole.

This is why the PDS, the main anti-poverty programme developed in India since independence, is valued so highly here, and constitutes such an important object of political contestation, especially during election times (Mooij 1999). As it will be reviewed below, Kerala had a very well-working state-level PDS before the policy changes introduced in 1997, and this is to be owed, by and large, to the political tradition described here, that views anti-poverty programmes and mechanisms as paramount devices for local human development. As this review goes on to comment on the PDS as a nation-wide programme for food security, the *sui generis* perspective of Kerala will be kept in mind, as it has dramatically influenced the ways in which the programme at the state level has been interpreted: furthermore, our entire case study – revolving around local informatisation of the PDS – would not have been possible with a different type of administration, that did not attach to the PDS the same redistributive value Kerala.

The PDS in India and Kerala

Anti-poverty programmes, devised by the central government and implemented at the level of state administrations, are integral part of India's development strategy. The PDS is the biggest anti-poverty programme ever implemented in India, in terms of both coverage and public expenditure (Tritah 2003: 2): the purpose of this programme is that of maximising food security for poor people, by subsidising the price of primary necessity items, mainly rice, wheat, sugar and kerosene. The mode of functioning of the PDS is articulated on three layers: firstly, the central government of India procures food at a procurement price from private producers; secondly, the government redistributes food to

the states at a central issue price (CIP); thirdly, food is redistributed by state governments to the people through authorized ration dealers (ARDs). The subsidy perceived by the citizens amounts to the difference between the CIP and the procurement price.

Originally, the PDS was universal, which means that the subsidy was intended to reach all citizens without discrimination: so designed, the programme accounted for an unsustainable level of expenditure for the central government (Umali-Deininger and Deininger 2001). As a result, the programme has been re-designed as the Targeted Public Distribution System (TPDS): the central government, on the basis of a standard income-based poverty line, determines the number of Below Poverty Line (BPL) people in each state, and allocates PDS goods among the states on the basis of relative poverty incidence. This implies that BPL people, who are entitled with ration cards, still have the right to buy PDS goods at subsidised prices, whereas Above Poverty Line (APL) people need to pay a higher price, which approaches that on the free market. The TPDS, which has been operating since June 1997, has been one of the principal instruments of structural adjustment that have pervaded India in the 1990s (Ramakumar 2010: 165): and still, adjustment has sorted mixed results across the states, with Kerala being one of the most negatively affected by targeting policies.

Before the changes occurred in 1997, Kerala boasted one of the best state-level PDS systems in India as a whole. PDS distribution catered to 97% of the population, which means, to all households except for the 3% that could cope with their own consumption needs (George 1979: 23); moreover, the impact of PDS on the population's nutritional status was high and significant (Kumar 1979). These successful outcomes were achieved in spite of the fact that Kerala needs to rely strongly on foodgrain imports, because the state is food-consuming rather than food-producing: the local agriculture is dominated by cash crops, and per capita production of rice hardly meets a quarter of the requirement

(Suryanarayana 2001: 240). It is widely argued that this extremely successful system stems as a natural consequence from the Kerala development model, which identifies development with human empowerment rather than with economic growth, and is oriented to redistribution, rather than to accumulation, of resources (Heller 1995; Parayil 2000; Veron 2001).

Yet, with the introduction of targeting policies, the PDS in Kerala has been put under severe strain, for three main reasons. Firstly, given that only 25% of the Kerala population has been termed BPL by the Government of India, allocation of foodgrains to the state has been reduced to only 10% of the previous supply (Swaminanthan 2002: 51). Secondly, the pricing gap between BPL and APL citizens for PDS goods has increased sharply, so much that APL citizens have massively shifted to the open market for a better price-quality ratio (Krishnakumar 2000). Thirdly, as a consequence of these two problems, ration shops are by and large becoming unviable and closing down, which undermines the capillary nature of a system where, originally, no house was located further than 2 km from the closest ARD (Nair 2000; Suchitra 2004).

The Government of Kerala has decided to face these problems by a thorough revitalisation of the procedures related to the PDS. Firstly, having estimated the BPL population at 42% instead of 25%, it has accepted to bear the burden of subsidy for the 17% BPL citizens for whom the Government of India does not provide (Krishnakumar 2000). Secondly, in order to face the TPDS-induced unviability of ration shops, it has provided ration dealers with a set of concessions, ranging from credit options to the allowance of selling non-PDS goods (Nair 2000). Thirdly, and most relevantly for our research, it has relied on the Kerala division of the National Informatics Centre (NIC) for the development of a suite of software for PDS implementation: namely, the Targeted Efficient Transparent Rationing and Allocation Public Distribution System (TETRAPDS). The system at the centre of our study, known

under the name of Ration Card Management System, has computerised the entire procedure for ration card releases: this system is integral part of the ensemble of digitalised procedures constituted by TETRAPDS, which is why it came to be generally known under the composite acronym of TETRAPDS-RCMS.

Ration Cards in Kerala

As the PDS is the main food security programme for the poor in India, the ration card is the document on which access to this programme crucially depends: indeed, purchase of PDS goods happens exclusively upon presentation of the ration card to the ARD. This document is household-based, and displays, on its first page, the poverty status of the family, from which the entitlement to PDS goods depends: as a result of targeting policies, poorer families are entitled to a higher amount of PDS goods per month, at a lower price resulting from greater subsidy.[2] The rationale behind this document is twofold: firstly, by assigning a unique identification to each household, ration cards should enforce targeting policies and minimize leakage of the programme to non-poor families, a problem for which the universal system was severely criticised (Umali-Deininger and Deininger 2001). Second, as a stamp is put by the ARD on the card at the moment of purchase of PDS commodities, this document should guarantee that households refrain from getting subsidised goods beyond their ration.

To understand the functioning of ration cards in Kerala, one state-specific peculiarity needs to be clarified. Diversely from the majority of Indian states, Kerala's PDS has remained, at least on paper, universal: this means that *all* families, including the APL, are entitled to a subsidy on PDS goods, even if this is minimum in the case of the APL. As a result, all households in Kerala are entitled to a ration card, on which the

---

2   Exact prices and quantities of rationed goods, corresponding to each poverty status, are established at the state level. The rationale behind targeting is, therefore, translated into reality in different ways depending on each state.

poverty status is specified: this can be APL, BPL, or AAY, where the latter, standing for Antyodaya Anna Yojana, indicates the poorest of the poor, and corresponds to a level of subsidy on rice that is even greater than that for BPL.[3] Poverty status for all Keralite families is established by a yearly census: the table below illustrates PDS entitlements for each category with respect to foodgrains, the staple PDS commodities. As shown in the table, the permanence of universality in Kerala is essentially nominal, because the APL subsidy approaches the price on the free market (where 1 kg of rice is around Rs.10).

Table 1: Kerala PDS foodgrain Entitlements and Costs

Category	Entitlement	Actual Distribution
APL	35 Kg.	8 kg. Rice at Rs. 8.90/- per kg. 2 Kg. Wheat at Rs. 6.40/- per kg. 2 Kg. Atta at Rs. 12/- per kg.
BPL	35 Kg.	18.75 Kg. rice at Rs. 1/- per kg. 16.25 Kg. Wheat at Rs. 2/- per kg. 2 Kg. Atta at Rs. 12/- per kg.
AAY	35 Kg. Rice	35 Kg. Rice at Rs. 1/- per kg.

Source: Justice Wadhwa Committee on Public Distribution System (2007) – amended as a consequence of the new food policy introduced in 2011 (shifting BPL and AAY rice price from Rs.2/- to Rs.1/- per kg.).

Many APL families, in Kerala, have abandoned PDS over time, due to the high perceived discrepancy between quality of PDS goods,

---

3   Other concessions, related to factors influencing family composition, may influence household provision of PDS goods. The main one in Kerala is the Annapoorna scheme, that provides 10 Kg of foodgrains per month free of cost to destitute above 65 years, with no or meager subsistence.

considered too low, and pricing levels that are close to free-market ones (Krishnakumar 2000). And yet, sustained inflation over the last years has caused a considerable number of APL households to return to PDS, especially as far as non-staple commodities – mainly sugar, oil and kerosene – are concerned. Here is, therefore, a primary reason on which the importance of the ration card for Keralites is grounded: this document is needed, by *all* citizens, to access low-cost provision of primary commodities under the PDS. This primary reason is matched by two accessory ones, that confirm the crucialty of this document for the citizens: firstly, this document is needed to prove poverty status, and thereby accessing anti-poverty benefits under other programmes that are rolled out, from time to time, by the government of India to the federated states. Thirdly, the ration card is often used as identity proof, and therefore it is important that it contains the names of all members in a determined household.

As a result of its strong tradition in terms of public action, and of the deep level of decentralisation that has followed Panchayati Raj reforms, Kerala is by far one of the best-administered states in the Indian federation as a whole (Veron 2001; Heller 2007). In such a well-managed state, the governmental procedure for obtaining a ration card should flow smoothly: application by the citizen, processing by the Department of Food and Civil Supplies, and delivery by the local Taluk Supply Office should follow each other in a fixed time frame.

Instead, perhaps paradoxically in the "good government" landscape that characterises Kerala, the procedure is ridden with serious problems, "epitomized by the back log of about six lakh applications, registered in July 2010" [4]. The dramatic situation described by Corbridge et al. (2005), with reference to states (e.g. Bihar) affected by severe malfunctioning of government, applies to the Taluk Supply Offices of

---

4   http://keralaitnews.com/e-governance/110-e-governance-/1220-ration-cards-online, accessed 5th December 2012.

the well-administered Kerala: every day, hundreds of people queue for hours in front of their local taluk, experiencing systematic frustration of the hope of collecting the ration card required. Never-ending queues, and the deep disappointment of people in them, are paradigmatic of what we mean by the concept of "lacking responsiveness" of the state to its citizens.

How was it possible, in the famously "well-functioning" local administration of Kerala, that such a serious delay could actually take place? A broader institutionalist lens, utilized with respect to this case, would probably point to the roadblocks to interaction between the different parts of the bureaucratic machine, to which the task of application processing is delegated. Indeed, the bureaucratic apparatus at work here is a complex one – as our case analysis will spell out, a plethora of internal agencies interact with respect to ration cards, and the sets of competencies of each one are not always clearly traced to specific entities. This reason, pertaining to an institutionalist vision on the actors in point, is to be combined with a more contingent one, that actually looks at the case *per se*: it is to be noted, indeed, that ration cards need to be changed by household on a frequent basis, i.e. every time the document expires – or a new family unit is formed (see below). Bureaucratic complications, coupled with the high transactional frequency implied by the ration card process, made it for the dramatic delay that the state of Kerala has experienced, which the system studied here, aiming to digitise the process itself, is committed to repair and remediate.

TETRAPDS-RCMS: The Digital Solution

The thousands of needful people, frustrated by inability of the government of Kerala to process their ration card applications, are the result of an ill-functioning technology of rule, in which the encounter between the state and citizens is ridden with delays and malpractice. The government of Kerala, whose reliance on e-governance as a means for problem-solving has been maximised over the last decade (Gopakumar

2007; Madon 2009; Masiero 2011), has decided to resort to a computerised application to face this issue: the Ration Card Management System, as mentioned above, has been devised as integral part of the digital ensemble of TETRAPDS. The purpose of the system is that of computerising the entire procedure for ration card release, from application to final delivery of the document required. The logic behind this programme corresponds to the rationale envisaged by Bovens and Zouridis (2002): indeed, digitalisation of this procedure involves automatisation, which, by removing human discretionality from the process, should ensure the system's prompt response to the requests of citizens.

This information system is based on the digitalization, operated at the beginning of the century, of data for all the PDS recipients in Kerala, i.e. 6.4 million households (Kumar 2002). The functioning of TETRAPDS-RCMS is organised along three operational phases. Firstly, citizens present their application for a ration card: application, which was previously performed at the Taluk-level front offices, is now submitted on the Internet, through the telecentres disseminated across the entire state. Secondly, regularity of application, and of the documents supporting it, is verified by the office of the Rationing Inspector, and, in case of a positive outcome, the new document is produced electronically, on the grounds of the database. Thirdly, once produced, the document is delivered by the local Taluk Supply Office, in a time frame that should correspond to that reported on the acknowledgement receipt, which has been produced online at the time of application.

So devised, the system should ensure delivery (or a clear motivation, in case of document denial) along three dimensions: actual performance, as applications made on the Internet should not be lost or deleted; time, as a specific time frame is ensured by the technology; and cost, as malpractice and corruption are to be avoided by computerised enforcement of the queue discipline. Hence, TETRAPDS-RCMS aims to ensure that a request of the citizen is matched by a prompt and timely

response by the government, with respect to a document – the ration card – which is of paramount importance in the life of Keralite citizens. Is the programme actually able to do so? The extent to which causality flows, from the digital system to higher responsiveness of the state, is the object of our case-study analysis and discussion.

Discussion

Having outlined the context and characteristics of the information system under observation, this section has the purpose of opening the black box of TETRAPDS-RCMS, illustrating the mechanisms that flow from application to final delivery of a ration card in Kerala. The system of actors gravitating around TETRAPDS-RCMS is at the centre of our discussion, as we aim to understand the ways in which technology acts upon interactions within this actor network. The encounter between the state and citizens, related to delivery of a ration card, is articulated in three phases: the first one, which TETRAPDS-RCMS does not directly contemplate, is the determination of the poverty status of each household in the state. The second phase coincides with application for a new ration card, and the third one pertains to governmental processing of the application and consequent delivery of the document. The functioning of this three-pronged procedure will be examined here, with particular regard to the role of technology in the pursuit and performance of each phase.

Determination of Poverty Status

As observed above, determination of the poverty status of households, in all India, has become relevant as a consequence of targeting policies, as the PDS, from June 1997 onwards, has been targeted specifically to reach the poor. In Kerala, the situation is *sui generis* in that all families, including the APL, have the right to obtaining a ration card: yet, the targeting mechanism is enacted by the design of the subsidy scheme, which provides rationed goods at below market prices for the

BPL and AAY, while reducing the amount of subsidy for APL families to a minimum. Therefore, poverty status determination constitutes a structural node of the system, upon which entitlement to subsidised PDS commodities is predicated.

Determination of poverty status occurs through a composite process, which is synthesized in the table below. Firstly, a poverty threshold is established: at the moment of writing, with reference to Kerala, BPL status is granted to families whose yearly income is below Rs. 21000, that corresponds to slightly more than $1 per day.[5] Secondly, a yearly census is performed, village by village, by groups of citizens encharged of this from the state government: these individuals belong primarily to two institutional areas, namely the Ward members and the units of Kudumbashree (the biggest organisation operating under the State Eradication Poverty Mission). Thirdly, having performed the census, these officers compile, at the village level, a list of families by poverty status: this list, once approved by the village government (Gram Panchayat), is submitted to the state council (Gram Sabha) for clearance. Finally, the verified and approved list is submitted to the Kerala State Information Technology Mission (KSITM), which is in charge of managing the database of all PDS beneficiaries in the state: officers at KSITM ensure that poverty status for each family is updated, in a way that, should any family move from the one status to the other, a new ration card, corresponding to the newly determined status, can be released.

---

5   Inclusion in the AAY category is predicated on a set of criteria in terms of destitution of households, therefore a precise numeric threshold is not identified for inclusion in this scheme.

Table 2: Process of Determination of Poverty Status in Kerala

Stage	Main Actor
Establishment of poverty threshold	Department of Food and Civil Supplies
Census – classification of households	Ward members, Kudumbashree unit members
Compilation of list of households by status	Ward members, Kudumbashree unit members
Approval of the list at the village level	Gram Panchayat
Approval of the list at the state level	Gram Sabha
Updating of the database of PDS recipients	Kerala State Information Technology Mission

What is the role of computerisation in this process? Here is the first problematic point, in terms of the technology at the centre of study: indeed, TETRAPDS-RCMS does not affect determination of poverty status, as the ration card procedure is computerised *from application* to delivery – not from the poverty classification of Keralite households. Human discretionality still plays a paramount role in the process: several villagers have remarked that, even if a poverty threshold officially exists, this can seldom be utilised as a benchmark for establishing poverty status, as most families do not have a way to prove their annual income level. As a result, the process of poverty status determination is surrounded by a high amount of uncertainty, where, at least in the general perception of PDS recipients, case-by-case decisions made by the officers have the final word. To say that with Bovens and Zouridis (2002), the transition to a system-level bureaucracy does not at all involve this

stage of the ration card procedure, which remains firmly in the hands of the street-level officials in charge.

It is worth, at this stage of analysis, to pause and reflect on the possible reasons, which may have induced designers of the ration card application technology to leave out the pre-conditional component of poverty status determination. Why is it, indeed, that this phase has remained at a paper-based stage, and is still highly governed by human discretionality? Looking, once again, at the issue from a standard institutional perspective, this decision may well be justified – poverty status determination is not, indeed, intrinsically part of the ration card procedure, it only acts as a preliminary process that determines the type of card that every household will receive. But, as soon as contingency factors are brought into play, this explanation does not seem valid anymore, exactly because, in Kerala, poverty status yields vital consequences for the quantity and price of goods to which each family is entitled: as a result, in the Kerala context, this phase *is* integral part of the process in point, should not be avulsed by it. An alternative perspective, as suggested by a substantial number of interviews conducted on the field, may be that, given the numerous benefits (in the PDS and beyond) attached to BPL status, there might be convenience in keeping the process cumbersome – so that local dynamics of privilege do not find a technological barrier: however, we would need more research for this hypothesis to be grounded on solid empirical data, which is why we leave it as only one of the potential interpretations of facts.

It should be noted, here, that the situation is different at the level of database management: once established, the poverty status of citizens is promptly entered in the state-level database, and modified in the case that household-level appraisal registers a change in this respect. But still, the core of the process, which lies in the outright determination of poverty status, is not at all touched by technology, and procedures for

establishing it are surrounded by an aura of uncertainty that is cause for widespread disappointment. Interviews at the village level have revealed high levels of frustration in citizens with respect to this point: many households, which consider themselves BPL, claimed that census officers failed in recognizing this status, leaving them with the little subsidy assigned by the PDS to APL families. This result matches the claim of Ramakumar (2010: 155), according to which the main problem of the PDS, at an all-India level, lies in the fact that targeting has left too many needful families outside the BPL status.

Application for a Ration Card

Upon access to the website of the Kerala Department of Food and Civil Supplies (http://civilsupplieskerala.gov.in), at the moment of writing, users are faced with a captivating, bright-red message: "Online ration card applications can be submitted by citizens through Akshaya centres". Akshaya centres are the telecentres – government-sponsored spaces, where computers and the Internet are made available to the public – located on the territory of Kerala as a whole. The Akshaya initiative, initially launched in a single district (Malappuram) in 2003, has been organised in two subsequent phases: the first one was oriented to e-literacy, and consisted in inviting a member of each household to the local telecentres, for being imparted a course in basic computer education. The second one, launched upon completion of the e-literacy programme, revolved around e-governance, and was predicated on the computerization of a plethora of ordinary government services, from the payment of bills to the submission of requests: the ration card application is, therefore, one of the last services in chronological order to be computerized. Akshaya, widely recognized as one of the most successful telecentre experiences in the subcontinent (Madon 2005, 2007 and 2009; Pal et al. 2006; Gopakumar 2007), has been rolled out from Malappuram to all the fourteen districts in Kerala in July 2007.

The initial phase of Akshaya, at its pilot stage in Malappuram district, has achieved the impressive result constituted by 100% household e-literacy, meaning that at least one member for each family has been instructed in the basics of computer usage (Madon 2005: 408). And yet, it should be noted that the real success of Akshaya reaches far beyond attainments in e-literacy, as the deep penetration of telecentres in the covered territory – no house, in Malappuram, would be more than 3km from the closest one – has made the Akshaya kiosks integral part of citizens' life. Trust-building around Akshaya, one of the key objectives both before and after state-wide rollout, has been proactively sustained by two combined factors: firstly, the consolidated reliance of Keralites on government institutions (Antin 2005; Gopakumar 2007), which was transferred on Akshaya due to its governmental brand, even if the actual management of e-kiosks is left with private entrepreneurs. Secondly, the strong leverage of the Akshaya project on the construction of human relations between e-kiosk entrepreneurs and citizens: entrepreneurs were selected among socially influential people in their communities, and were constructed as the "human link" between people and the novelty of ICTs (Masiero 2011: 13). The combination of these two elements, the governmental versus the personal one, accounts for major reliance of citizens on the Akshaya brand, and makes telecentres a highly used environment – in which the Internet-based device for ration card application has been just inserted.

The TETRAPDS-RCMS toolkit for online application, after a pilot-project launch in Kannur district in late 2009, has been rolled out to the entire state of Kerala in September 2010. Online application for a ration card is performed as follows: citizens approach the local Akshaya centre, fill in the application form available on the website of the Department of Food and Civil Supplies, provide the documents required (which are scanned by the telecentre staff, or in a private shop before application), pay a fee of Rs.15 ($0.34), and get an acknowledgement receipt, which displays the date when the new ration card will be available

for collection, from the closest Taluk Supply Office. It should be noted here that the ration card is a composite document, which needs to be updated in correspondence of several changes in households: therefore, occasions in which a new ration card are to be requested and obtained are numerous. Modifications belong primarily to two orders:

- Changes in location, if a given household moves from its place and needs to be linked to a new ration shop (each household can collect goods only from the one ARD serving its area),

- Changes in household composition: this includes addition-deletion of members in the family, emission of a new card if a new household is created (through marriage), and splitting of the ration card if one or more members move away from the family house.

Emission of a new ration card, or modification of an existing one in the cases listed above, can be performed through the website of the Department of Food and Civil Supplies. In principle, people could do it from home, but the coexistence in Akshaya centres of facilities and a trained staff make telecentres the easiest option for performing this operation.

In this discourse, it is important to remark the strength of political appeal, exercised by Akshaya on the Keralite population. In the perception of people, Akshaya constitutes the dominant technology for interfacing with the government, and its good reputation and experience made it a synonym for computer accessibility and reliance. Uncertainty, that normally surrounds a new Internet-based application, tends to be drastically minimized when the application is subsumed under the Akshaya brand: as a result, the bright-red message on the website of the Department of Food and Civil Supplies does not surprise us, because bringing something under the umbrella of Akshaya is almost *per se* a guarantee for success. As a result, this part of the ration card procedure

seems to work well, and its user-friendliness is positively appraised by both the citizens and Akshaya entrepreneurs, who proactively help their customers with actual performance of the application.

Ration Card Processing and Delivery

Before the launch of TETRAPDS-RCMS, Keralite citizens, to request a new ration card or a modification of the existent one, needed to physically approach the closest taluk supply office. There they would spend long hours in a queue – ration card applications were normally accepted on a single specific weekday – and, due to the burgeoning amount of requests, they would take the risk of not being dealt with at all: if served, they would be provided with an acknowledgement receipt, reporting the expected day of availability of the requested document. Processing time, reported on the receipt, would be calculated by work-pressed Taluk officers, asymmetrically informed in terms of the time required by the Department of Food and Civil Supplies for giving clearance. As of now, time frames are automatically provided by the system set up by TETRAPDS-RCMS: online application, in sum, has translated this part of the process into a system-level bureaucracy, where the discretionality previously exerted by street-level officials has been removed. And yet, after submission of applications, what role is left for technology in document processing and delivery?

The whole process of ration card release in Kerala is summarised in the figure below. Upon performance of online application, this is submitted, along with the documents required, to the office of the Rationing Inspector, located at the Department of Food and Civil Supplies. The office of the Rationing Inspector performs field-level verification, to ensure that all the needed documentation has been provided by the applicant in the right form, and prepares a verification report, which is then sent to the Taluk Supply Office of reference: the report reveals whether application is accepted, in which case a new ration card is to be printed by the Taluk, or rejected, in which case a

reason for rejection is clearly stated. This process should occur within the time span displayed on the acknowledgement receipt, which, in normal conditions, ranges between 7 and 15 working days: as a result, on the date established for collection, the citizen should physically approach the Taluk and receive either the new card, or a clear motivation for rejection.

Table 3: Process of Ration Card Delivery in Kerala

Stage	Actor
Application through Akshaya telecentres	Citizen (aided by telecentre entrepreneur)
Verification by the Rationing Inspector	Rationing Inspector and office staff
Preparation of verification report	Rationing Inspector and office staff
Printing of ration card (or motivated rejection)	Taluk Supply Officers
Delivery of ration card	Taluk Supply Officers

And yet, as mentioned above, before the rollout of TETRAPDS-RCMS, 600 thousands ration card applications were pending, as something would get stuck in the mechanics underpinning the dynamics of application processing. Where was the problem? Our work, as it resulted from analysis of the actor network around TETRAPDS-RCMS, revealed that the bottleneck lies at the heart of application processing, i.e. verification of applications by the Rationing Inspector. In the dominant perception of citizens, this phase is encapsulated in an aura of confusion and discretionality: citizens, when asked about the mechanics and objects of verification, displayed high uncertainty in terms of the parameters being verified and their meaning. Even more strikingly, interviews conducted at the office of the Rationing Inspector shed little light on these dynamics: interviewees uniformly spoke about "regularity

of the documents", but attempts to gain more precise insights (which documents? How is "regularity" measured? *What* is actually verified?) were unsuccessful. As a result, the confusion surrounding state-level verification infuses deep uncertainty in the process of ration card release, which is thereby affected by systematic and severe delays.

Having identified the key bottleneck, with the uncertainty surrounding verification by the Rationing Inspector, it is necessary to see what has been done by TETRAPDS-RCMS, to deal with the problem by the infusion of digital technologies in the procedure. And here is where the problem emerges: in this phase, to which systematic delays in ration card releases are traced, computerisation has not at all being achieved. Digitalisation, as devised by TETRAPDS-RCMS, is limited to what happens *before* this stage (submission of applications from Akshaya telecentres to the Rationing Inspector) and *after* it (printing of the new ration card by the Taluk Supply Office, in the case of successful applications). Still, the principal node of the problem, i.e. verification itself, remains surrounded by uncertain criteria, and left in the hands of the street-level officials in charge of this procedure at the office of the Rationing Inspector.

This is why the process turns out, ultimately, to perpetuate existing failure. Indeed, many citizens report, with frustration, that upon their visit at the Taluk, on the day listed on their acknowledgement receipt, they have not found the card or a reason for rejection, but just apologies and the suggestion to come back after some time, whose length is not precisely estimated and determined. Here we have, once again, a situation similar to determination of poverty status: the structural problem – the node constituted by verification from the rationing inspector – is left firmly in the hands of street-level officials, without any limitation to their discretionality and uncertainty of the process. We conclude, therefore, that not one, but two structural problems of ration card releases have been ignored by TETRAPDS-RCMS: these are the determination

of poverty status, and the verification of regularity of applications by the Rationing Inspector.

Analysis: Structural Problems versus Politically Appealing Objectives

The table below schematises the entire process of ration card release in Kerala, putting together the three phases that we have deconstructed above. In the scheme, every phase is matched with the extent to which existing procedures have been reshaped by the computerisation induced by TETRAPDS-RCMS. As it emerges from our discussion, digitalization of ration card releases revolves primarily around application submission, whereas the crucial nodes constituted by determination of poverty status and verification of applications are left entirely untouched by the intervention of TETRAPDS-RCMS.

Table 4: Ration Card Release Process – Extent of Computerisation for Each Phase

Phase	Computerised Parts of the Process	Non-Computerised Parts of the Process	Overall extent of Digita-lisation
Determination of poverty status	Updating of the database of PDS recipients	Census – classification of households	Low
Application for a ration card	Application performance and submission through Akshaya telecentres	None	High
Ration card processing and delivery	Printing of new ration card based on database of PDS recipients	Verification by the Rationing Inspector	Low

The two key phases, with which the technology of TETRAPDS-RCMS does not deal, have two characteristics in common: firstly, as mentioned already, these phases constitute structural nodes in the process, as their functioning is crucial for the requests of citizens on the PDS to be properly met. On the one hand, indeed, determination of poverty status is the process upon which assignation of PDS goods to each household is predicated: its malfunctioning leaves a plethora of needful families without recognition of BPL status, and therefore without access to the PDS provisions for the poor. On the other hand, verification of applications is crucial for ration cards to be actually produced, and confusion at the core of this process is at the root of the burgeoning amount of applications that, instead of being properly processed, remain stuck in the pipeline for a long time. Secondly, these nodes have a common denominator constituted by lack of political attractiveness: these are, indeed, back-end processes, which happen "behind the scenes" and leave no room for citizen participation in their achievement.

Conversely, computerisation induced by TETRAPDS-RCMS has been targeted in order to match a politically appealing node: namely, the submission of ration card applications, performed directly by the citizens through Akshaya centres. It is our view that the political payoff, stemming from specific attention to this part of the process, has a twofold origin: first, citizens directly participate in the system, which allows them to take an active role as they operate at the interface with the government. Second, the consolidated trust of Keralite citizens in Akshaya – that is conceived, in the collective perception, as the primary digital interface with the government – tends to be transferred on the application, which is what usually happens when a new digital tool is subsumed under the well-established, deeply trusted Akshaya brand. The political payoff, resulting from the combination of these two elements, has boosted the consensus of citizens, around the new application and the government who launched it: as we view things in this light, it is not surprising to find the application to be met with

favour by those who got to know about it, but never actually tried it for their own needs and purposes. Conversely, disappointment affects the majority of users whose application is in the pipeline: frustration is traced to the structural nodes that do not work properly, and that the computerization led under TETRAPDS-RCMS, focusing mostly on the front-end phase of the process, has left utterly and totally untouched.

As a result, maximisation of responsiveness of the state to citizens, that TETRAPDS-RCMS was originally aimed to obtain, remains by and large unfulfilled by this application as it is designed. Responsiveness, in the micro-cosm constituted by the process of ration card releases, is predicated on two structural nodes that, due to their lack of political attractiveness, have been dismissed by the new technology, while digitalisation has been tailored specifically for pursuing political consensus. To use, once again, the formulation of Bovens and Zouridis (2002), determination of poverty status and verification of applications remain firmly in the hands of street-level bureaucrats, and automatisation does not affect these crucial parts of the process. With an information system organised like this, state responsiveness continues to be low, because the prevalence of political considerations leaves the causal roots of the problem untouched.

There is still a broader, more developmental perspective, in which our work can be read and interpreted. What we have recounted here is, indeed, a case in which the solution to a political issue, i.e. willingness to make electoral-populist objectives prevail on the urgency for solving structural problems, is delegated to a technical tool, namely the technology that computerises ration card applications. This is, indeed, a situation in which what is *not* there (applications to systematise determination of poverty status, and to regulate processing of application forms) counts at least as much as the infrastructure that is actually into place. To conclude our case analysis, we wish, therefore, to position our work in its contextual space of analysis: it is indeed not a new phenomenon, in south Asian

history, that the solution of a political problem is *de facto* obnubilated by the creation of a technical infrastructure.

Paradigmatically, according to a substantial stream of thought, the Green Revolution has followed a process that mirrors, at the macro level, very much the same dynamics described above: the gist of the process was, indeed, that of maximising food provisions in absolute terms, whereas famines in India where – as remarked profoundly by Sen (2001) – rather the result of crises in relative entitlements to food. Normative discussion on historically similar cases, while not being the key focus of this paper, helps us conceptualising the problem in broader terms. And reflection on recent Indian history, with the problem of persisting inequality at its core, and the vision of the 1990s as a potentially "lost decade" for poverty reduction, suggests that, as suggested by Ferguson's (1995) masterpiece, an "anti-politics machine" may be at work: the political effects of developmental interventions are, indeed, being neglected, in favour of the aspect of sheer technical improvements. Hence, before we move to theoretical and practical implications of our analysis, we submit that a primary, broader lesson from this case may be that technicality, while important, is not a perfect substitute for political intelligence, and, by obnubilating it, can also work against the very processes of life quality amelioration.

Implications: Restructuring ICT-Mediated State Responsiveness

Our thesis in this work is that, for information systems to maximize responsiveness of state-level providers to their citizens, ICTs need to target the structural nodes from which the problem of unresponsiveness of government is generated. Failure arises, instead, from the governmental misdirection of ICTs towards measures aimed at political consensus, which, while gaining approval from citizens and potentially increasing probability of re-election, leave unattended the issues that lie at the core of the problem of unresponsiveness. The case of TETRAPDS-RCMS, which reflects the question of state responsiveness

in the micro-cosm of ration card releases in Kerala, is a paradigmatic illustration of this argument: ICT-based intervention, in this case, has been directed towards improvement of the application procedure, a node whose political appeal is proactively aided by direct participation of the citizen in the process, and by the well-trusted and consolidated Akshaya brand. Instead, the structural problems at the basis of lacking state responsiveness – identified, by our analysis, with uncertain determination of the poverty status of households, and confused procedures in the verification of applications – have been left untouched by the new technology, and, as a result, citizen dissatisfaction with the process has remained high and sustained.

The theoretical context in which this argument is inscribed can be traced to the seminal work of Markus (1983), whose core argument is that information systems are not developed through dynamics of rational action, but through dynamics of political power, characterised in postcolonial nations as the logics of governmentality (Chatterjee 2004). In fact, in the microcosm of the ration card procedure in Kerala, the choice of focusing ICT-based improvement on application through Akshaya centres, rather than on the crucial nodes of poverty status determination and verification processes, does not respond to rational logic, but to precise political considerations related to the creation of collective consensus. Furthermore, our work confirms the contextualist tenets of Avgerou (2001, 2004), which points out that emphasis on technical-rational reasoning is not sufficient for analysis of information systems dynamics, as applications are to be observed with respect to the field of institutional forces that characterises every context of implementation. It is clear, in our case, that the network of actors gravitating around TETRAPDS-RCMS is governed by political rationalities, rather than technical ones: our case can be seen as restating the conclusion, powerfully set out by Cordella and Iannacci (2010), that "technology makes politics", i.e. it carries the objectives of government from political agendas to the reality of facts.

The problem lies, indeed, in the fact that, if these objectives coincide with sheer, immediate political popularity, rather than with long-term improvements to the system, this constitutes grounds for failure, because the structural problems causing state unresponsiveness remain untouched, whereas the logic of governmentality does not allow issues to emerge for what they are. This observation should be set against the background of ICT4D, a field that, while highly preoccupied with failure, generally fails to lay out the causal foundations on which failure is predicated. In our work, a cause for failure is identified in the mismatch between targeting of ICT-based intervention towards structural problems, and its political appeal: reflection, as we suggest it for those engaging in analysis of ICT4D projects, should be on (1) the existence or not of a clear identification of the problems to be targeted, and (2) adequacy of information system design for finding a solution to these problems. This implication, we sustain, is instrumental in shedding some light on the largely obscure field of causes of failure in ICT4D.

In practical terms, implications of our argument are translated into operational suggestions, for those that engage in ICT-based policymaking and information system design, with specific reference to developing country contexts affected by the problem of state unresponsiveness. The core recommendation here, if long-term improvements in the relationship between state and citizens are to be effected through ICTs, is that of prioritizing structural problems in this relation, rather than using e-government as an easy tool for propaganda. We are aware of the difficulties implicit in following this prescription on practical grounds, especially in contexts where reactivity of citizens to ICT-based intervention is high: yet, the short-term payoff earned by propaganda is not likely to generate long-term returns, as demonstrated by dissatisfaction of the Keralite citizens who actually used TETRAPDS-RCMS, and whose application got stuck in the pipeline at the non-computerized verification status. Identifying the structural nodes of the existing problems, and addressing them by the design of specific ICT-

based toolkits, constitutes the one way for creating a mechanism linking ICTs to "good government" in terms of state responsiveness.

Conclusion

In this paper we have tried to understand, against the background of high preoccupation with failure that characterises ICT4D, how ICTs can maximise the responsiveness of government, conceptualised, with reference to the Indian case, as a way for citizens to "see the state" in a clearer and more accessible way. We have focused on the case study provided by computerization of the ration card procedure in Kerala, where a typical problem of state unresponsiveness – mirrored by a burgeoning amount of unattended ration card applications – is matched by a typical e-government solution, i.e. digitalisation of document releases. We have seen that, while the structural problems of the process of ration card delivery lie within two crucial nodes, namely poverty status determination and verification of applications, the digital solution devised in Kerala addresses predominantly the front-end process of application for a ration card. This part of the process enjoys high political appeal, due to direct involvement of end users and sponsorisation by the well-trusted Akshaya brand: yet, focus on it leaves untouched the structural causes of unresponsiveness, which constitutes grounds for failure.

Our argument, as illustrated throughout the case study, is that, to maximise responsiveness of the government, ICTs need to target the structural problems from which unresponsiveness is generated, rather than use e-government as a toolkit for political propaganda. Indeed, while the latter usage is devised to generate returns on the short run, it is highly unlikely that a strategy which ignores the structural nodes of the problem pays off on the longer run, as permanence of problems – especially when a solution had been promised – generates widespread disappointment and frustration. Therefore, theoretical implications – in terms of shedding light on the mechanics of failure in ICT4D – are

matched here by practical ones, which provide policymakers using ICTs with an agenda setting that prioritizes identification of structural problems, and recommends a mode of information system design that is specific for tackling them.

As a consequence, the point according to which information systems are not to be studied in a vacuum, as if they were avulsed from their context of implementation, is reinstated here, as context analysis is necessary in order to identify the structural problems causing state unresponsiveness. Once these have been identified, it is a choice of the governments in charge to deal with them through specific application, or to relegate ICT to the mere role of instruments for propaganda. Still, if the objective of the process is achieving "good government" in terms of better state responsiveness, the payoff of strategies centred on political appeal is minimum: if the field observed here wants to be worth the name of "ICT4D", the use of new technologies should be significant and relevant on the long run, not just a short-term instrument to create consensus when elections approach.

Silvia Masiero is a PhD Candidate at the Information System and Innovation Group (ISIG), Department of Management, London School of Economics and Political Science (LSE). She has also been affiliated to CDS as a Foreign Researcher, throughout Academic Year 2011/ 2012. Her research interests include development planning, e-governance, and the application of digital technologies to national schemes for food security and poverty reduction.

References

Ahuja, A. and P. Chibber. 2006. Civic Duty, Empowerment and Patronage: Patterns of Political Participation in India. Working Paper at University of California, Los Angeles, Department of Political Science.

Antin, J. 2005. The Case for Culturally Appropriate Kiosks: an Ecological Approach to Technology and Culture. Annual Meetings of the American Anthropological Association, November 2005, Washington DC.

Avgerou, C. 2008. 'Information Systems in Developing Countries: a Critical Research Review'. *Journal of Information Technology* 23(3): 133-146.

Avgerou, C. 2004. 'IT as an Institutional Actor in Developing Countries'. In: Krishna, S. and S. Madon, (eds) *The Digital Challenge: Information Technology in the Development Context.* London: Ashgate Publishing.

Avgerou, C. 2003. 'The Link between ICT and Economic Growth in the Discourse of Development'. In Korpela, M., R. Montealegre and A. Poulymenakou (eds), *Organisational Information Systems in the Context of Globalisation.* London: Kluwer Academic Publishers.

Avgerou, C. 2001. 'The Significance of Context in Information Systems and Organizational Change'. *Information Systems Journal* 11(1): 43-63.

Avgerou, C., and G. Walsham (eds). 2000. *Information Technology in Context: Studies from the Perspective of Developing Countries.* London: Ashgate.

Bardhan, P., and D. Mookherjee. 2004. 'Poverty Alleviation Efforts of Panchayats in West Bengal'. *Economic and Political Weekly*, 39(9): 965-974.

Bekkers, V., and V. Homburg. 2007. 'The Myths of E-Government: Looking Beyond the Assumptions of a New and Better Government'. *The Information Society* 23(3): 373–382.

Benbasat, I., D.K. Goldstein, and M. Mead. 1987. 'The Case Research Strategy in Studies of Information Systems'. *MIS Quarterly* 11(3): 369-386.

Bhatnagar, S. C. 2004. *E-Government from Vision to Implementation: a Practical Guide with Case Studies*. Sage Publications, New Delhi.

Bovens, M. and S. Zouridis. 2002. 'From Street-Level to System-Level Bureaucracies: How Information and Communication Technology Is Transforming Administrative Discretion and Constitutional Control'. *Public Administration Review*, 62(2):174-184.

Brett, E.A. 2003. 'Participation and Accountability in Development Management'. *Journal of Development Studies,* 40(2): 1-29.

Chadwick, A., and C. May. 2003. 'Interaction between States and Citizens in the Age of the Internet: E-Government in the United States, Britain and the European Union'. *Governance* 16(2): 271-300.

Chambers, R. 1997. *Whose Reality Counts? Putting the First Last*. London: Intermediate Technology Publications Ltd.

Chatterjee, Partha. 1986. *Nationalist Thought and the Colonial World: A Derivative Discourse*. London: Zed Books.

Chopra, P. 1982. 'The Paradox of Kerala'. *World Health Forum* 3(1): 74-77.

Ciborra, C. 2005. 'Interpreting E-Government and Development: Efficiency, Transparency or Governance at a Distance?', *Information Technology & People*, 18(3): 260-279.

Corbridge, S., G. Williams, M. Srivastava and R. Veron. 2005. *Seeing the State: Governance and Governmentality in India*. Cambridge: Cambridge University Press.

Corbridge, S., G. Williams, M. Srivastava and R. Veron. 2003a. 'Making Social Science Matter - I: How the Local State Works in Rural Bihar, Jharkhand and West Bengal'. *Economic and Political Weekly,* 38(24): 2377-2389.

Corbridge, S., G. Williams, M. Srivastava and R. Veron. 2003b. 'Making Social Science Matter - II: How the Rural Poor See the State in Bihar, Jharkhand and West Bengal'. *Economic and Political Weekly, 38(25):* 2561-2569.

Cordella, A., and F. Iannacci. 2010. 'Information Systems in the Public Sector: the E-Government Enactment Framework'. *Journal of Strategic Information Systems*, 19(1): 52-66.

Cordella, A., and L. Willcocks. 2010. 'Outsourcing, Bureaucracy and Public Value: Reappraising the Notion of the "Contract State",' *Government Information Quarterly*, 27(1): 82-88.

Cordella, A. 2007. 'E-Government: Towards the E-Bureaucratic Form?' *Journal of Information Technology* 22(2): 265-274.

Crotty, M. 1998. *The Foundations of Social Research*. London: Sage Publications.

Dagron, A.G.. 2001. 'Prometheus Riding a Cadillac? Telecentres as the Promised Flame of Knowledge'. *Journal of Development Communication*, 2(2): 1-7.

Dasgupta, J. 2001. 'India's Federal Design and Multicultural National Construction'. In Kohli, A. (ed), *The Success of India's Democracy*, Cambridge: Cambridge University Press.

Dunleavy, P., H. Margetts, S. Bastow, and J. Tinkler. 2006. *Digital Era Governance*. Oxford: Oxford University Press.

Ferguson, J. 1995. *The Anti-Politics Machine: Development, Depoliticization, and Bureaucratic Power in Lesotho*. London: Sage.

George, P.S. 1979. Public Distribution of Foodgrains in Kerala: Income Distribution Implications and Effectiveness. International Food Policy Research Institute, Research Report No.7.

Gopakumar, K. 2007. 'E-Governance Services Through Telecentres: the Role of Human Intermediary and Issues of Trust'. *Information Technologies and International Development*, 4(1): 19-35.

Hacking, I. 1999. *The Social Construction of What?* Cambridge: Harvard University Press.

Heeks, R., and S. Bailur. 2007. 'Analyzing E-Government Research: Perspectives, Philosophies, Theories, Methods, and Practice'. *Government Information Quarterly* 24(2): 243-265.

Heeks, R. 2006. 'Health Information Systems: Failure, Success, and Improvisation'. *International Journal of Medical Informatics* 75(2): 125-137.

Heeks, R. 2005. 'ICTs and the MDGs: On the Wrong Track?' *Information for Development* 3(2).

Heeks, R. 2001. Understanding E-Governance for Development. IDPM Working Paper Series, No. 11, University of Manchester.

Heller, P. 2007. Making Citizens from Below: the Prospects and Challenges of Decentralization in India. Paper prepared for the conference "A Great Transformation?" Columbia University, September 14-16, 2007.

Heller, P. 1995. 'From Class Struggle to Class Compromise: Redistribution and Growth in a South Indian State'. *Journal of Development Studies* 31(5): 645-672.

Hood, C. 1991. 'A Public Management for All Seasons?' *Public Administration* 69 (1): 3-19.

Kahn, M.H. 1997. 'State Failure in Weak States: A Critique of New Institutionalist Explanations'. In Harris, J., Hunter, J. and Lewis,

C.M. (eds), *The New Institutional Economics and Third World Development*. London: Routledge.

Kochar, A. 2008. 'The Effectiveness of India's Anti-Poverty Programmes'. *Journal of Development Studies*, 44(9): 1289-1308.

Kooiman, J. 2003. *Governing as Governance*. London: Sage.

Krishnakumar. R. 2000. 'Public Distribution System: a System in Peril'. *Frontline* 17(19): 16-29.

Kumar, A. 2002. 'E-Government and Efficiency, Accountability and Transparency'. *Electronic Journal on Information Systems in Developing Countries* 12(2): 1-5.

Kumar, S.K. 1979. Impact of Subsidized Rice on Food Consumption and Nutrition in Kerala. International Food Policy Research Institute, Research Report No. 5.

Madon, S. 2009. *E-Governance for Development: A Focus on Rural India*. London: Palgrave-Macmillan.

Madon, S. 2007. Telecentres and Development: a Social Space Approach. Working Paper No. 164, Information Systems and Innovation Group, London School of Economics and Political Science.

Madon, S. 2005. 'Governance Lessons from the Experience of Telecentres in Kerala'. *European Journal of Information Systems*, 14(4): 401-417.

Markus, L. 1983. 'Power, Politics, and MIS Implementation'. *Communications of the ACM*, 26(6): 430-444.

Masiero, S. 2011. 'Financial vs. Social Sustainability of Telecentres: Mutual Exclusion or Mutual Reinforcement?' *Electronic Journal of Information Systems in Developing Countries*, 45(3): 1-23.

Mercer, C. 2006. 'Telecentres and Transformations: Modernizing Tanzania through the Internet'. *African Affairs*, 105/419: 243-264.

Mitra, S.K. 'Making Local Government Work: Local Elites, Panchayati Raj and Governance in India'. In Kohli, A. (ed), *The Success of India's Democracy*, Cambridge: Cambridge University Press.

Mooij, J. 1999. *Food Policy and the Indian State: The Public Distribution System in South India*. Delhi: Oxford University Press.

Nair, E. C. 2000. Interview. *Frontline* 17(19): 16-29.

Oestmann, S., and A.C. Dymond. 2001. 'Telecentres - Experiences, Lessons and Trends'. In Latchem, Colin and David Walker (eds), *Telecentre: Case Studies and Key Issues*. Vancouver: Commonwealth of Learning.

Osborne, D., and T. Gaebler. 1992. *Reinventing Government: How the Entrepreneurial Spirit is Transforming the Public Sector*. Boston: Addison-Wesley.

Pal, J., S. Nedevschi, R.K. Patra and E. Brewer. 2006. 'A Multidisciplinary Approach to Studying Village Internet Kiosk Initiatives: the Case of Akshaya'. *E-Learning* 3(3): 291-316.

Parayil, G. 2000. 'Introduction: is Kerala's Development Experience a "Model"? In Parayil, G. (ed), *Kerala - The Development Experience*, Zed Books, London.

Prakash, B. A. 2004. 'Economic Backwardness and Economic Reforms in Kerala'. In Prakash, Brahm A. (ed), *Kerala's Economic Development: Performance and Problems in the Post-Liberalization Period*. New Delhi: Sage Publications.

Ramakumar, R. 2010. 'The Unique ID Project in India: A Skeptical Note'. *Ethics and Policy of Biometrics*, 6005, 154-168.

Rose, N., and P. Miller. 2010. 'Political Power Beyond the State: Problematics of Government'. *The British Journal of Sociology* 43(2): 173-205.

Sayer, A. 2000. *Realism and Social Science*. London: Sage Publications.

Sismondo, S. 1993. 'Some Social Constructions'. *Social Studies of Science*, 23(3): 515-553.

Subrahmanian, K.K. 1990. 'Development Paradox in Kerala: Analysis of Industrial Stagnation'. *Economic and Political Weekly*, 25(37): 2053-2055 and 2057-2058.

Suchitra, M. 2004. 'Undermining a Fine Public Distribution System in Kerala'. *India Together*, 7(1), 2-4.

Suryanarayana, M. H. 2001. 'Economic Reform versus Food Security: Kerala's Gordian Knot'. *Journal of International Development* 13(2): 239-253.

Swaminanthan, M. 2002. 'Excluding the Needy: the Public Provisioning of Food in India'. *Social Scientist*, 30(3-4), 34-58.

Tharamangalam, J. 1998. 'The Perils of Social Development Without Economic Growth: The Development Debacle of Kerala, India'. *Bulletin of Concerned Asian Scholars* 30 (1): 23-34.

Tritah, A. 2003. The Public Distribution System in India: Counting the Poor for Making the Poor Count. Toulouse, France: Université des Sciences Sociales, Groupe de Recherche en Economie Mathematique et Quantitative.

Umali-Deininger, D. L., and K. W. Deininger. 2001. 'Towards Greater Food Security for India's Poor: Balancing Government Intervention and Private Competition'. *Agricultural Economies* 25(2-3): 321-335.

United Nations Development Programme (UNDP). 2001. Human Development Report 2001: Making New Technologies Work for Human Development. UNDP: Washington DC.

Unsworth, S. 2005. Focusing Aid on Good Governance: Can Foreign Aid Instruments be Used to Enhance "Good Governance" in Recipient Countries? Global Economic Governance Programme, Oxford: University College.

Veron, R. 2001. 'The "new" Kerala Model: Lessons for Sustainable Development'. *World Development* 29(4): 601-617.

Wade, R.H. 2002. 'Bridging the Digital Divide: New Route to Development or New Form of Dependency?' *Global Governance*, 8(4): 53-85.

Walsham, G. and S. Sahay. 2006. 'Research on Information Systems in Developing Countries: Current Landscapes and Future Prospects'. *Information Technology for Development*. 12(1): 7-24.

World Bank. 2004. World Development Report 2004: Making Services Work for Poor People. World Bank: Washington DC.

World Bank. 1999. World Development Report 1998/1999: Knowledge for Development. World Bank: Washington DC.

Yin, R. 2001. *Case Study Research: Design and Methods*. London: Sage.

PUBLICATIONS

For information on all publications, please visit the CDS Website: www.cds.edu. The Working Paper Series was initiated in 1971. Working Papers from 279 can be downloaded from the site.

The Working Papers published after April 2007 are listed below:

W.P. 450 K. C. ZACHARIAH, S. IRUDAYA RAJAN, *Inflexion In Kerala's Gulf Connection Report on Kerala Migration Survey 2011,* September 2012*.*

W.P. 449 TAPAS K. SEN *Recent Developments in Kerala State Finances,* July 2012.

W.P. 448 SUNIL MANI AND ARUN M, *Liberalisation of Technical Education in Kerala: Has a Significant Increase in Enrolment Translated into increase in Supply of Engineers?* March 2012.

W.P. 447 VIJAYAMOHANAN PILLAI N. *Modeling Optimal Time-Differential Pricing of Electricity Under Uncertainty: Revisiting the Welfare Foundations,* March 2012.

W.P. 446 D. NARAYANA *The Pricing Problem of Public Transport in Kerala,* September 2011.

W.P. 445 PRAVEENA KODOTH AND V. J. VARGHESE *Emigration of Women Domestic Workers from Kerala: Gender, State Policy and the Politics of Movement,* September   2011.

W.P. 444 SUNIL MANI *The Mobile Communications Services Industry in India: Has it led to India Becoming a Manufacturing Hub for Telecommunication Equipments?* April   2011.

W.P. 443 K. C. ZACHARIAH, S. IRUDAYA RAJAN, *From Kerala to Kerala Via The Gulf; Emigration Experiences of Return Emigrants.* March 2011.

W.P. 442 VIJAY KORRA, *Short Duration Migration in India: An Appraisal from Census 2001.* March 2011.

W.P. 441 M.PARAMESWARAN, *Financial Crisis and Kerala Economy.* January 2011.

W.P. 440 **P.L. BEENA,** *Financing Pattern of Indian Corporate Sector under Liberalisation: With Focus on Acquiring Firms Abroad.* January 2011.

W.P. 439 **RAJEEV SHARMA** *Diversification in Rural Livelihood Strategies: A Macro-Level Evidence from Jammu and Kashmir,* December 2010.

W.P. 438 **APARNA NAIR,** *The indifferent many and the hostile few: An Assessment of Smallpox Vaccination in the 'Model Native State' of Travancore 1804-1941.* November 2010.

W.P. 437 **VINOJ ABRAHAM,** *The Effect of Information Technology on Wage Inequality: Evidence from Indian Manufacturing Sector.* September 2010.

W.P. 436 **S. IRUDAYA RAJAN, D. NARAYANA,** *The Financial Crisis in the Gulf and its Impact on South Asian Migrant Workers.* August 2010.

W.P. 435 **ANUP KUMAR BHANDARI,** *Total Factor Productivity Growth and its Decomposition: An Assessment of the Indian Banking Sector in the True Liberalised Era.* August 2010

W.P. 434 **BEENA SARASWATHY,** *Cross-Border Mergers and Acquisitions in India: Extent, Nature and Structure.* July 2010.

W.P. 433 **VIJAY KORRA,** *Nature and Characteristics of Seasonal Labour Migration: A Case Study in Mahabubnagar District of Andhra Pradesh.* July 2010

W.P. 432 **K.C. ZACHARIAH S. IRUDAYA RAJAN,** *Impact of the Global Recession on Migration and Remittances in Kerala: New Evidences from the Return Migration Survey (RMS) 2009.* June 2010.

W.P. 431 **GARGI SANATI,** *Integration of India's Financial Markets on the Domestic and International Fronts: An Empirical Analysis of the Post-Liberalisation Period,* June 2010.

W.P. 430 **SUNIL MANI,** *Has China and India Become more Innovative Since the onset of Reforms in theTwo Countries?* May 2010.

W.P. 429 T. R. DILIP, *School Educational Attainment in Kerala: Trends And Differentials.* April 2010.

W.P. 428 SUNIL MANI, *The Flight from Defence to Civilian Space: Evolution of the Sectoral System of Innovation of India's Aerospace Industry.* April 2010.

W.P. 427 J. DEVIKA, V. J. VARGHESE, *To Survive or to Flourish? Minority Rights and Syrian Christian Community Assertions in 20th Century Travancore/Kerala.* April 2010.

W.P. 426 ANUP KUMAR BHANDARI, *Global Crisis, Environmental Volatility and Expansion of the Indian Leather Industry.* March 2010.

W.P. 425 P L. BEENA, HRUSHIKESH MALLICK, *Exchange Rate and Export Behaviour of Indian Textiles & Clothing Sector: An Enquiry for Major Destination Countries.* March 2010.

W.P. 424 K. C. ZACHARIAH, S. IRUDAYA RAJAN, *Migration Monitoring Study, 2008 Emigration and Remittances in the Context of Surge in Oil Prices.* March 2010.

W.P. 423 VIJAYAMOHANAN PILLAI N, *Loss of Load Probability of a Power System: Kerala.* February 2010.

W.P. 422 JAYASEKHAR S, **C. NALIN KUMAR,** *Compliance, Competitiveness and Market Access: A Study on Indian Seafood Industry.* February 2010.

W.P. 421 S. IRUDAYA RAJAN, V.J. VARGHESE, M.S. JAYAKUMAR *Overseas Recruitment in India: Structures, Practices and Remedies.* December 2009.

W.P. 420 V.J. VARGHESE, *Land, Labour and Migrations: Understanding Kerala's Economic Modernity,* December 2009.

W.P. 419 R.MOHAN, D. SHYJAN *Tax Devolution and Grant Distribution to States in India Analysis and Roadmap for Alternatives,* December 2009.

W.P. 418 WILLIAM JOE & U. S. MISHRA *Household Out-of-Pocket Healthcare Expenditure in India Levels, Patterns and Policy Concerns,* October 2009.

W.P. 417 NEETHI P *Globalisation Lived Locally: New Forms of Control, Conflict and Response Among Labour in Kerala, Examined Through a Labour Geography Lens.* October 2009.

W.P. 416 SUNIL MANI *High skilled migration from India, An analysis of its economic implications,* September 2009.

W.P. 415 SUNIL MANI *Has India Become more Innovative Since 1991? Analysis of the Evidence and Some Disquieting Features,* September 2009.

W.P. 414 WILLIAM JOE, PRIYAJIT SAMAIYAR, U. S. MISHRA *Migration and Urban Poverty in India Some Preliminary Observations,* September 2009.

W.P. 413 K. N. NAIR, T.P. SREEDHARAN, M. ANOOPKUMAR, *A Study of National Rural Employment Guarantee Programme in Three Grama Panchayats of Kasaragod District,* August 2009

W.P. 412 B.S. SURAN, D. NARAYANA, *The Deluge of Debt: Understanding the Financial Needs of Poor Households.* July 2009

W.P. 411 K. NAVANEETHAM , M. KABIR , C.S. KRISHNAKUMAR *Morbidity Patterns in Kerala: Levels and Determinants.* April 2009.

W.P. 410 ARINDAM BANERJEE, *Peasant Classes, Farm Incomes and Rural Indebtedness: An Analysis of Household Production Data from two States.* March 2009.

W.P. 409 SUNIL MANI, *The Growth of Knowledge-intensive Entrepreneurship in India, 1991-2007 Analysis of its Evidence and the Facilitating Factors.* February, 2009

W.P. 408 M. S. HARILAL, *Home to Market: Responses, Resurgence and Transformation of Ayurveda from 1830s to 1920.* November 2008

W.P. 407 HRUSHIKESH MALLICK, *Do Remittances Impact the Economy ? Some Empirical Evidences from a Developing Economy.* October 2008.

W.P. 406 K.C.ZACHARIAH, S.IRUDAYA RAJAN, *Costs of Basic Services in Kerala, 2007, Education, Health, Childbirth and Finance (Loans)* September 2008.

W.P. 405 SUNIL MANI *Financing of industrial innovations in India How effective are tax incentives for R&D?* August 2008.

W.P. 404 VINOJ ABRAHAM *Employment Growth in Rural India: Distress Driven?* August 2008.

W.P. 403 HRUSHIKESH MALLICK, *Government Spending, Trade Openness and Economic Growth in India: A Time Series Analysis.* July 2008.

W.P. 402 K. PUSHPANGADAN, G. MURUGAN, *Dynamics of Rural Water Supply in Coastal Kerala: A Sustainable Development View,* June 2008

W.P. 401 K. K. SUBRAHMANIAN, SYAM PRASAD, *Rising Inequality With High Growth Isn't this Trend Worrisome? Analysis of Kerala Experience,* June 2008

W.P. 400 T.R. DILIP, *Role of Private Hospitals in Kerala: An Exploration,* June 2008

W.P. 399 V. DHANYA, *Liberalisation of Tropical Commodity Market and Adding-up Problem: A Bound Test Approach,* March 2008

W.P. 398 P. MOHANAN PILLAI, N. SHANTA, *ICT and Employment Promotion Among Poor Women: How can we Make it Happen? Some Reflections on Kerala's Experience.* February 2008.

W.P. 397 K.N.NAIR, VINEETHA MENON, *Distress Debt and Suicides among Agrarian Households: Findings from three Village Studies in Kerala.* December 2007

W.P. 396 K.N.NAIR, C.P. VINOD, VINEETHA MENON, *Agrarian Distress and Livelihood Strategies: A Study in Pulpalli Panchayat, Wayanad District, Kerala* December 2007

W.P. 395 K.C. ZACHARIAH, S.IRUDAYA RAJAN, *Migration, Remittances And Employment Short-term Trends and Long-term Implications.* December 2007

W.P. 394 K.N.NAIR, ANTONYTO PAUL, VINEETHA MENON, *Livelihood Risks and Coping strategies: A Case Study in the Agrarian Village of Cherumad, Kerala.* November 2007

W.P. 393 S. IRUDAYA RAJAN, U.S.MISHRA, *Managing Migration in the Philippines: Lessons for India.* November 2007.

W.P. 392 K.N. NAIR, R. RAMAKUMAR *Agrarian Distress and Rural Livelihoods, a Study in Upputhara Panchayat Idukki District, Kerala.* November 2007.

W.P. 391 PULAPRE BALAKRISHNAN, *Visible hand: Public policy and economic growth in the Nehru era.* November 2007.

W.P. 390 SUNIL MANI, *The Growth Performance of India's Telecommunications Services Industry, 1991-2006 Can it Lead to the Emergence of a Domestic Manufacturing Hub?* September 2007.

W.P. 389 K. J. JOSEPH, VINOJ ABRAHAM, *Information Technology and Productivity: Evidence from India's Manufacturing Sector.* September 2007.

W.P. 388 HRUSHIKESH MALLICK, *Does Energy Consumption Fuel Economic Growth In India?* September 2007.

W.P. 387 D. SHYJAN, *Public Investment and Agricultural Productivity: A State-wise Analysis of Foodgrains in India.* July 2007.

W.P. 386 J. DEVIKA, *'A People United in Development': Developmentalism in Modern Malayalee Identity.* June 2007.

W.P. 385 M. PARAMESWARAN, *International Trade, R&D Spillovers and Productivity: Evidence from Indian Manufacturing Industry.* June 2007.

W.P. 384 K. C. ZACHARIAH, S. IRUDAYA RAJAN *Economic and Social Dynamics of Migration in Kerala, 1999-2004 Analysis of Panel Data.* May 2007.

W.P. 383 SAIKAT SINHA ROY *Demand and Supply Factors in the Determination or India's Disaggregated Manufactured Exports : A Simultaneous Error-Correction Approach.* May 2007.