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eLand Governance in India: Transcending Digitization

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Abstract. Land governance is a complex issue to be addressed in many countries including India. All three branches of the government viz. judiciary, executive and legislature have tried to address the issue in various forms but have failed to achieve the outcomes of development. The failure, or limited success can be attributed to their narrow vision of or focus on the problem. The objectives of land governance have changed over time. With the advent of digitization, land administration has become more efficient and transparent, aiding the managerial process of land records and registration. However, the outcomes of economic, social, human, and cultural development, have been given paltry importance. In this paper we present the cases of Bhoomi and KAVERI, two initiatives to computerize land records and registration in the state of Karnataka, India. We present an ontological framework to envision the big picture in eLand governance. We argue that in achieving the desired outcome, we must see the problem in its entirety without losing focus on its key aspects. Regarding eland Governance, policy instruments, eGovernance, and land governance must work in tandem.

Keywords: eLand Governance, Ontology, eGovernance, Land Administration

1   Introduction

The quest to achieve better land governance in India has been a matter of continuous engagement. The aims of reforms have changed with successive governments since independence in 1947. From what started as permanent settlement of land to non-settled areas, to the protection of the rights of the landlords, to the protection of the rights of agricultural laborer and small tenants [15] and now, to the promotion of business interests for investment and job creation, the land governance regime has undergone tremendous shift. Revenue accrued from land was one of the important sources of revenue for the government in the pre-British and British era. After independence, the shift turned towards equitable distribution of land, and revenue collection did not remain as the primary objective. However, details of the land and the record maintenance pattern has not undergone much changes [32]. Land record management has been traditionally

managed by the revenue department, and with the decrease in revenue from the land the importance of keeping the updated records has gradually decreased. Added to that is the high cost of record updating with periodical surveys which is a disincentive for the department to improve the record management. Though it is an important element in bringing about the improvement in performance, accountability and transparency, record management has not been given much importance [24, 32].

With the IT (information technology) revolution in the country, many states have adopted an 'e' (digital) way to maintain the records. This shift to digital system from a traditional one has enabled better decision making. eGovernment initiatives taken by the governments are deliberated with priority owing to the optimistic sentiment of 'future in eGovernment' [1]. The transition through electronification to eGovernment can be understood by the analysis of successful and failed case studies of the implementation. eGovernment is one of the most sought after means [38] to build citizen trust in governments. eGovernment initiatives are initiated by governments to fulfil various objectives of better public service delivery, effective governance, better participation, and better management of public resources [13]. Today technology is being used for core management objectives rather than mere peripheral activity [40]. Based on the priority given to these objectives, eGovernment initiatives for land governance can either be a failure or success.

The technological impact of any eGovernment initiative can be broadly classified as optimistic, neutral, and pessimistic. The introduction of eGovernment will also result in social impacts based on the various social determinants, which is pushed by the human choices within the social structures [19].

Karnataka's Bhoomi and KAVERI (Karnataka is a state in India) initiatives were established to computerize the land records (Rights, Crops and Tenancy) of farmers and registration of the same, with all the operations that surround it [6]. Set up by the revenue department, Bhoomi was a successful eGovernment system which won several awards including example of 'best practice' by World Bank [35]. It promoted the easy retrieval of records for verification and changes which is core to the domains of computer science, information systems and public administration. Bhoomi's success is mainly attributed to a) comprehensive background application which is inclusive of cropping details of the farmers, b) self-sustaining nature of the project and c) international recognition [6].

KAVERI was initiated by the Department of Stamps and Registration to computerize the registration of property transactions, lease agreements, general power of attorney, wills etc. There has been provision for integration of KAVERI with Bhoomi to solve the problem of data vacuum.

This paper critically analyses how an eGovernment initiative can promote and achieve the object of land governance. The paper analyses Bhoomi project and KAVERI of the Indian state of Karnataka through an ontological lens by analyzing, mapping, and identifying the 'bright', 'light' and 'blind' spots – the areas which have been stressed heavily, lightly, and not at all (either deliberately or accidentally).

Land governance is central to the development of nations and has become an important challenge to governance. An ideal land registry system must provide and enable

secure/ private/ reliable/ timely information/transaction/interaction for various stake-holders in conformity with land governance principles, as encapsulated in the ontology. For better land governance, a transparent, comprehensive and legitimate record system that allows for easy mutation is also necessary. Access to land assures in investment and growth, equal opportunity, equity, and woman's empowerment [21]. Land tenure affects productivity through land related investment, using land as collateral for credit and transferring land to more productive (non-agricultural) users. Rapid economic development, expanding population, urbanization and climate change call for a strong framework to create policies regarding land use and defining clear land rights [10]. The 'e' initiatives in this area play an important role in defining the developmental outcomes as well. It is vital to note that the 'e' initiatives should act as 'means' to achieve the 'ends' of development rather than being the 'end' in themselves. This study highlights the need for envisioning the 'big picture' with the help of an ontological framework. The framework articulates large number of pathways to achieve effective land govern-ance and achieve the outcomes with the help of eGovernance initiatives. This can be used to develop future solutions based on new and innovative pathways.

The paper is structured as follows; first, we present the ontological framework and the logic of the construction. Then we present the ontological map of Bhoomi and KAVERI. Last, we discuss the results and present the conclusion.

2   Ontology of eLand Governance

The issue of land governance and administration has been an important topic of de-bate in both research and policy domains. There is an oversight in understanding and articulating the architecture of the complexity of the problem [33]. The methods and efforts of solving, in most of the cases has been focused on a single part of the problem missing the 'big picture'. There is a need to bring the complexity of the problem to the foreground and address it systemically and systematically.

The ontology represents the conceptual understanding of eLand Governance [17]. With the framework, the analysis and synthesis of any domain can be carried out in a novel way [30]. The ontology can be used to deconstruct an ill-structured problem and organize the terminologies and taxonomies in a structured manner [18]. It also system-atizes the description [3] of eLand Governance. The eGovernment framework [28] is further modified to encompass the land governance to form a comprehensive yet parsi-monious framework. Such frameworks have been used for ontological meta-analysis and synthesis of mHealth [2] and Public Health Informatics research [31], and of re-search in other domains.

We present the ontological framework of eLand Governance in Figure 1. It is a hi-erarchical deconstruction of the problem. The framework is constructed by an iterative process and it is scalable and extendable. (The glossary defining all the elements of the framework is not attached in the draft)

The first level of deconstruction of the problem is represented as the concatenation of Policy Instruments, eGovernance and Land Governance. It is a linguistic, logical concatenation and not an algebraic or arithmetic addition. Thus:

eLand Governance = f (Policy Instruments + eGovernance + Land Governance)

In the second level of deconstruction, eGovernance is deconstructed into Medium, Quality and Type. Land Governance is deconstructed into Principles, Object and Outcome. The dimension Entity is a common dimension for eGovernance and Land Governance. Thus:

eGovernance = f (Medium + Quality + Type + Entity)

Land Governance = f (Entity + Principles + Object + Outcome)

In the next level of hierarchy, each dimension is represented by a one level or two-level taxonomy of elements. Thus:

Policy Instruments ⊂ (Legislative, Regulatory, Economic, Fiscal, Contractual, Information, Social)

Policy instruments are the instruments that can be utilized to have an effect on eLand Governance based on the literature on public policy [4].

Medium ⊂ (People, Paper, PC/Web$_{(e)}$, Smart Phone$_{(e)}$, Social Media$_{(e)}$)

Quality ⊂ (Secure, Private, Reliable, Timely)

Type ⊂ (Storage$_{(information)}$, Retrieval$_{(information)}$, Distribution$_{(information)}$, Transaction, Interaction)

Entity ⊂ (Local$_{(Govt)}$, State$_{(Govt)}$, Central$_{(Govt)}$, Intermediaries, Citizens, Private Sector$_{(Business)}$, Public Sector$_{(Business)}$, NGO/Civil Society)

Principles ⊂ (Legitimate, Equitable, Responsive, Efficient, Participatory, Transparent, Integrity, Sustainable)

Object ⊂ (Access, Use, Rights, Development)

Outcome ⊂ (Economic, Social, Human, Cultural)

The eight dimensions arranged from left to right with connecting terms (symbols/words/phrases) forms a natural English sentence which represent potential pathways for eLand Governance. Thus, the total number of pathways in the framework are 7*(5*4*5) *8*(8*4*4) = 716,800 components. Three illustrative components derived from the framework are:

Implementation of Legislative instruments for PC/Web$_{electronic}$ based timely Distribution$_{information}$ services for Citizens for Legitimate Access of land for Economic development.

Implementation of Regulatory instruments for Paper based Secure Transaction service for Private Sector$_{Business}$ for Transparent Use of land for Economic development.

Implementation of Social instruments for People based Reliable Interaction services by Local$_{Government}$ for Participatory Development of land for Social development.

eLand Governance

Policy		eGovernance			Land Governance		
Instrument	**Medium**	**Quality**	**Type**	**Entity**	**Principles**	**Object**	**Outcome**
[Implementation of]	[-based]	[+]	[+]	[services for/by]	[for]	[+] [to/of land for]	[development]
Legislative	People	Secure	Information	Governments	Legitimate	Access	Economic
Regulatory	Paper	Private	Storage	Local/Municipal	Equitable	Use	Social
Economic	Electronics (e)	Reliable	Retrieval	Provincial/State	Responsive	Rights	Human
Fiscal	PC/Web	Timely	Distribution	Central/Federal	Efficient	Development	Cultural
Contractual	Smart phone		Transaction	Intermediaries	Participatory		
Information	Social media		Interaction	Citizens	Transparent		
Social				Businesses	Integrity		
				Private Sector	Sustainable		
				Public Sector			
				NGOs/ Civil Society			

[instruments for]

Fig. 1. Ontology of eLand Governance

The comprehensiveness of the ontology serves as the justification for its validity. It is constructed logically incorporating empirical realities. The dimensions and taxonomies are taken from the literature in eGovernance and land governance domains. The ontology tries to capture the independence and interdependence of elements. From the analysis of interaction within the ontology, we will be able to look at the problem at different levels of granularity without forsaking the complexity of the problem, ultimately resulting in a comprehensive research. The 716,800 components encapsulated in the ontological framework represent the complete requirement to manage eLand Governance systematically and systemically. Some of the combinations may be infeasible or not instantiated. Research, policy, and practice can be mapped onto the framework to identify the frequently, infrequently and never instantiated paths for the achievement of the objective. For this study, the authors have mapped the design and objective document of Bhoomi and KAVERI projects in Karnataka [11, 12, 16, 34].

3 Results of Coding

Figure 2 below shows the results of the coding of Bhoomi and KAVERI design and objective document. The document was mapped manually onto the ontology using MS Excel using a binary scale (present, absent). Two coders reviewed the sections in the document to determine whether the element from the ontology is present or absent in the section. Each coded item was peer reviewed and final coding based on the consensus among the coders. The glossary was used to assure the validity of coding.

The number in the parentheses adjacent to each element represents the frequency of the occurrence of that element in the design and objective document. The bar below each element is a visual representation of relative frequency of the element. The minimum number is 0, if the element is not mentioned in the document. In the following, we will discuss each dimension of the ontology, left to right.

Policy Instruments: The instruments in general receive very little focus. The broad objective of both the projects is just electronification and ease of registration. However, there is a little focus on Legislative and Economic instruments.

Medium: Electronics- PC/Web is a bright spot in 'Medium' which explains that majority of the transactions happen from web, either via kiosks or from the official personnel level. There is little emphasis on paper and people in the Bhoomi and KAVERI projects.

Quality: Privacy is not at all considered in the project. Reliability and Timeliness have been given more emphasis than Security in the Implementation.

Type: All the elements in Service type attracts emphasis in the implementation of Bhoomi and KAVERI. The highest concentration is on Transaction followed by Information Storage and Interaction.

Entity: Local Government and Citizens are highly emphasized in the project. Businesses and Civil Societies attract very little attention. Though Intermediaries play an important role in smooth functioning of the systems, their emphasis in design and objective has been light.

Principles: Legitimate, Transparent and Efficient Principles are dominant, whereas Responsive, Equitable and Integrity are very lightly focused. Participatory and Sustainability principles of land governance are not at all looked into in the projects.

Object: Access and Rights are dominantly focused neglecting the Use and Development of land.

Outcome: The Outcomes of Land Governance has not been the primary focus of the project. Economic, Social and Human development outcomes are very lightly emphasized while Cultural Development aspect has been an oversight.

4   Discussion

Land information needs to be carefully managed and handled to obtain the potential benefits. The program envisioned in the Sixth Five Year Plan (From 1980-1985) for the records updating found a strong base in the Seventh Five Year Plan which said "Land records form the base for all land reform measures and therefore, regular periodic updating of land records is essential in all states." [36]. Bhoomi and KAVERI have succeeded in the process of automation of land records and registration. However, the extent to which these eGovernment initiatives have assured in comprehensive land governance remains to be seen. Our mapping reveals that Bhoomi and KAVERI, as information systems, have only mildly aided in comprehensive land governance to bring about economic, social, human, and cultural development. The implicit idea of achieving development outcomes by computerization (ibid) forms a flawed logic in a diverse country like India which has a complex land administration which varies considerably across states [7], and without proper planning and evidence based policy actions, the achievement of outcomes is difficult.

While digitization may be the first step towards eLand Governance, it alone cannot ensure developmental outcomes. An efficient land administrative system requires an effective land policy framework along with an interoperable (semantic, legal, inter – community and technical) land information infrastructure [22, 39].The Bhoomi and KAVERI systems, established in the 2000s, haven't undergone any changes to further their objectives beyond mere automation. While they have served as successful land information systems in some capacity, they have thus far acted as standalone systems that have failed to integrate into a larger land governance framework to realize broader, more tangible outcomes.

Land administrative systems must strive to achieve social political and environmental sustainability through government decision making and citizen participation [14]. However, the blind spot under the sustainable development outcome of the framework, reveals that the KAVERI and Bhoomi, as information systems have not informed the overall land administrative system to attain sustainable development. Although Bhoomi is a sustainable information system, generating revenue to finance itself, it has not facilitated sustainable land governance principle.
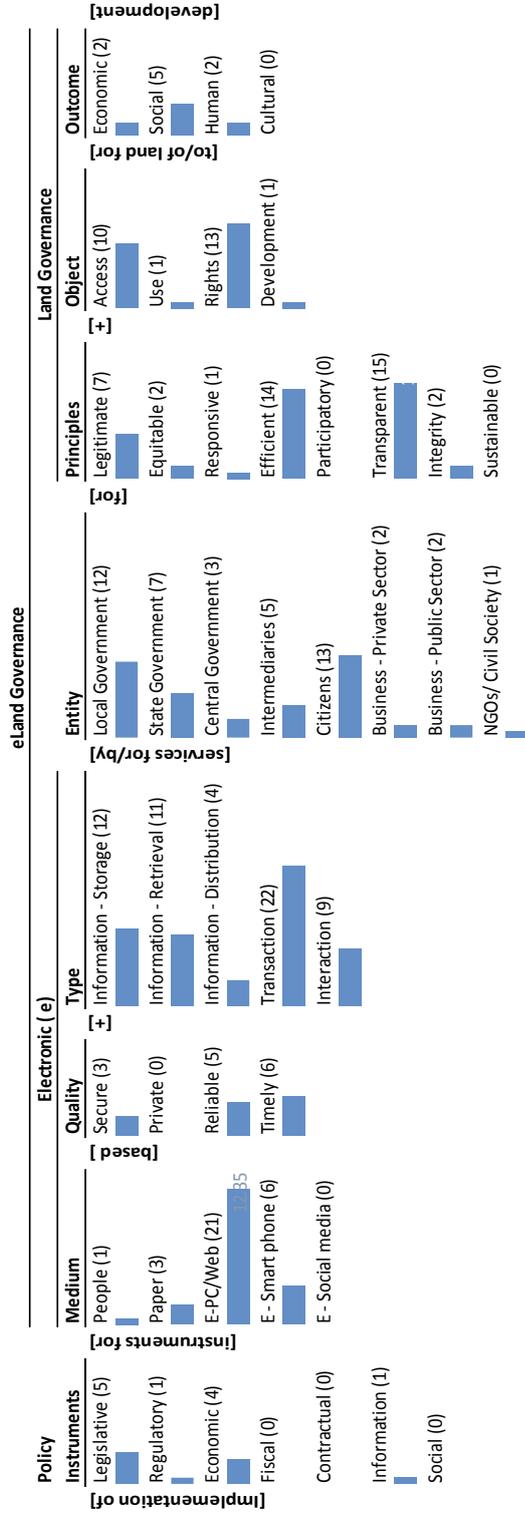
Fig. 2. Ontological map of eLand Governance

The mapping shows that KAVERI and Bhoomi provide legitimate documents that ensure land rights and access. Clear rights and access leads to security of land tenure which promotes greater incentive to invest in land and use it for productive activities [8]. However, this land security has not led to any substantial economic development outcome. Lack of proper field verification has led to incorrect entries into the Bhoomi system [32] as well. Therefore, there exists a presumed security of rights by land registration systems only effective on paper, without any practical value [9].

The Bhoomi and KAVERI system have assisted the governments from the local to the central level in decreasing order, as shown by our mapping results. While the managerial process has been taken care of, how this land information system has assisted the local Karnataka government in facilitating development outcomes through principled land governance, remains an unanswered question. This could be a result of narrow objectives, initially set for the systems. If the objectives of these systems are not prioritized efficiently, the result of economic, social, human and cultural development may never be realized.

Eminent domain and other restrictions on land use, exercised by governments may lead to tenure insecurity and discourage investment unless such powers are applied in a transparent manner [9]. In practice, distribution of landownership, doesn't happen through market mechanisms but instead through an already existing power structure which is further solidified by the land registration system (ibid). Furthermore, outdated land records have been transferred on to the Bhoomi system without proper field verification [32]. Therefore, appropriate legislative and regulatory instruments for enforcing property rights must work in tandem with error free, verified information systems to ensure development outcomes and prevent misuse of land.

The results of our coding reveal a blind spot on Participatory Land governance. The principle of participation in land governance has been overlooked by Bhoomi and KAVERI. To obtain timely land information results, a participatory land information system is required [25]. Such a system requires the consideration of various social, political and economic aspects, apart from technical solutions and administrative procedures (ibid). Furthermore, a participatory approach to land use planning accounts for the rights of all vulnerable communities [10] thereby promoting human development.

The People element under the medium dimension has also been only mildly emphasized. KAVERI aims at 100% automation of the registration process while Bhoomi aims at disintermediation, and complete automation of land record management. The presence of People in the framework is essential as no digitized system can operate without some degree of the human element [1]. Even the most advanced forms of eGovernment use the element of People [29] as a medium for delivering services. In the context of developing countries, it becomes necessary to fit in human intermediaries to ensure appropriate penetration of ICT technology to reach the poor [27] as well as to endorse participatory land governance. Using Volunteered Geographic Information has helped in securing land rights through a participatory manner and has in turn facilitated social and human development of rural people in the villages if Africa [25].

Although Bhoomi was initiated for the easy retrieval of land records by farmers at nominal rates, farmers demands were unaccounted for, in the designing the system. The ability of technology to change the attitudes of the citizens is derived from their trust in

the government [38]. In essence, Bhoomi, has not facilitated active participation of citizens in social change, but has merely created an efficient information management model [37].

The digitization of land information has led to transparency and ease of transactions which have helped greatly in administration [26]. This in turn has helped in transparent land governance. However, through the process of automation, Bhoomi initiative has essentially aided the revenue department, in its bureaucratic functions. For comprehensive e governance initiatives, focus on demand side as to why and when citizen use eGovernance facilities becomes as important as supply side perspectives [20].

5 Conclusion

Land information systems are an indispensable aspect of land governance systems. Bhoomi and KAVERI have successfully computerized land records and registration and facilitated the easy storage, retrieval and updating of data, while citizen benefits and development outcomes have taken up a secondary priority. While technology remains a driving force for land governance, the objectives of such governance need to been renewed in order to attain overall developmental outcomes [5]. The latest development in managing land registries is the use of blockchain technology. This technology provides for a decentralized, public ledger that is seen as a solution to the challenges of record keeping [23]. Bhoomi and KAVERI initiatives haven't been updated since their commencement. A new approach must be put forward to prioritize developmental outcomes, rather than assuming such outcomes will be realized merely through digitization. A modern land governance system must function to guarantee land rights, tenure and credit, provide information for land planning and development, and manage land transfer and assets, [14] which can enable societal development. This requires synchrony between a strong policy framework, capable land administration and a robust information system. Therefore, information systems must not work as silos (as in the case of KAVERI and Bhoomi) but instead work in harmony with the policy and administration system. Bhoomi and KAVERI need to function within the policy framework of land governance and in turn assist in providing informed evidence-based policies of land governance. The ontology reveals an absence of emphasis on the participatory and sustainable principle, a very mild emphasis on equitable, responsive and integrity principles, and a substantial emphasis on the efficiency principle of land governance. This is because the multidimensional approach of effecting comprehensive land governance through information systems is absent. Land use planning and development must also take place through a participatory approach through the inclusion of people in the information systems to achieve sustainability. A narrow objective of digitization without focusing on the bigger picture can lead to a myopic vision thereby under-utilizing the capacity of Bhoomi and KAVERI. ICT must be applied as an enabler for principled land governance to achieve the outcomes of economic, social, cultural and human development. Using the ontology of Land eGovernance, pathways for attainment of comprehensive development through land governance aided by ICT infrastructure can be uncovered.

6   References

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