

# Telecommunication regulation as a game: deepening theoretical understanding

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The authors are both students of the Master programme in Systems Engineering, Policy Analysis and Management at Delft University of Technology. This working paper is an extension on their previous publications in the South African Journal of Information & Communication Technology and at the EAEPE 2007 conference. All these writings are based on a research internship in the Summer of 2005 in Johannesburg, at the LINK Centre of the University of Witwatersrand.

## Working paper

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## Abstract

This working paper extends the mainstream theoretical thinking in the field of telecommunications regulations to better fit with processes perceived in rural areas.

The implicit framework of Levy & Spiller, Berg and Stern & Holder is extended to incorporate ideas of public administration theory, especially Kiser & Ostrom's three levels of action. In this way, processes at different policy levels are viewed as games in themselves and we can better explain the observed behaviour of actors and the outcomes of the regulatory process than mainstream thinking does.

## Introduction

The South African government has, over the years, devised a complex policy to stimulate telecommunication infrastructures and services to develop in rural areas. By means of so-called under-serviced area licenses (USALs), several benefits are distributed in a tender process in which small, black-empowered companies can participate. The regulation process showed some remarkable outcomes, which cannot be explained fully by the mainstream theoretical frameworks used for the analysis of telecommunication regulation. A striking example is the absence of clear interconnection guidelines, which is prescribed and to a lesser extent predicted by the status quo theories. This working paper aims to pinpoint the explanatory failure and introduces some new theories and concepts, particularly action arenas, from the field of policy science to broaden and deepen our analysis. We propose an adjusted conceptual framework that incorporates both the current theories, mainly based on the work of Levy & Spiller, and the concepts of Kiser & Ostrom. We will argue that in order to understand the processes in developing countries, especially when dealing with emerging companies, one needs a somewhat different framework than what is sufficient to understand the western situation. The core of our addition is twofold. First, drawing up regulation should be viewed as a policy game in itself. Secondly, the introduction of a constitutional choice level in our framework enables us to apply the rich literature on policy networks.

The case description is based on a two-person, two-month field and desk research in South Africa. The analysis has been sharpened during the EAEPE 2007 conference and several discussions with Delft University of Technology staff. We would like to express our special gratitude towards Andrew Barendse, who facilitated our field work and spotted opportunities to sharpen our analysis, and Joop Koppenjan, who helped bridging the theoretical worlds of regulation theory and policy science.

The first part of this paper is dedicated to current thinking in economics and its application to the case in South Africa. From this application it becomes apparent that an explanation gap exists. At the end of the paper an extension to current theories is given which would close the gap.

## Classical thinking

Much has been written about regulation and the analysis of regulatory effectiveness. Levy & Spiller have introduced the concepts of regulatory governance and regulatory content (or incentives). They define governance as “(...) the mechanisms that societies use to constrain regulatory discretion and to resolve conflicts that arise in relation to these constraints.” (Levy & Spiller, 1994, p. 205) No formal definition of regulatory incentives (regulatory content) is given, but they state that it “comprises the rules governing utility pricing, cross- or direct subsidies, entry, interconnection, etc.” The concepts of Levy & Spiller are regularly used to analyse regulatory effectiveness. It is often claimed that regulatory governance determines regulatory content (Stern & Holder, 1999) (Berg, 2000a). As Stirton & Lodge (2003) put it, Levy & Spiller’s distinctive contribution is “...their analysis of how a country’s background pattern of legislative, judicial and administrative arrangements contributes to solving the so-called ‘commitment problem’, by acting as mechanisms for restraining expropriation of investors by predatory governments.” (p. 2) While we lend the useful concepts of regulatory governance and content, we will focus on regulation in a much broader sense, as containing all possible regulatory incentives with a specific focus on the problem of the influence of emerging companies, which we will call the ‘participation problem’.

Stern & Holder (1999) recognise that regulatory governance is in part self-determinant, but through actors. They operationalised regulatory governance and included participation by the actors into the analysis. In this paper the operationalisation of regulatory governance by Stern & Holder will be used. They recognised a difference between the design and the process of regulatory governance. The first one can be described by the clarity of roles, autonomy and accountability. The process can be described by participation, transparency and predictability indicators.

Berg linked regulatory governance and content, in a web with other factors, to performance. In analyzing our case, we will depart from a simplified version of his conceptual framework. With regard to participation, Berg makes a remark that will turn out to be very important in the remainder of this paper: “Note that unless formal and informal processes are in alignment, transparency can be threatened.” (p. 16). A second important lesson from best practice regulation is “recognize that both communication and consultation are necessary if stakeholders are to be informed of rules and allowed to contribute to regulatory discussions.” (p. 17) Indeed, communication and consultation are recognized by the Australian Competition Commission as best practice principles of good regulation, together with consistency, predictability, flexibility, independence, effectiveness & efficiency, accountability and transparency (Berg, 2000b, p. 161). Figure 1 is a visual representation of the aggregation of the concepts in the models mentioned in this paragraph.

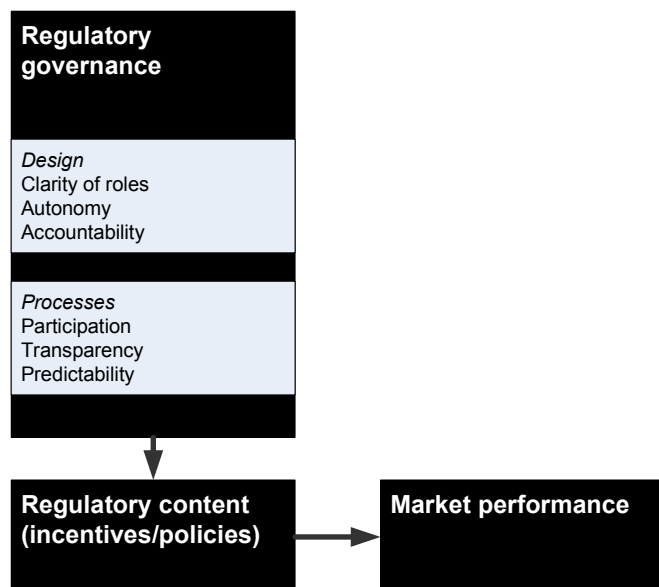


Figure 1 Conceptual model (current understanding).

## **Case description**

South Africa has a complicated history in which the infamous apartheid regime plays an important role. In 1994, when the apartheid was finally lifted and the ANC won the elections, a new era arrived. Since 1994 the ANC has focussed on empowering the black majority of people who have been held back by the apartheid. This 'Black Economic Empowerment' program touches all aspects of the economy, including the telecommunications market. In 2001 the Minister of Telecommunications of South Africa recognised that large areas of South Africa were not covered by telecommunications services. At that time the fixed-line penetration did not exceed 11% (11 lines per hundred inhabitants) and the mobile phone penetration was 17% (Telkom, 2006). The South African telecommunications market consisted of four companies: the incumbent fixed operator Telkom and three mobile operators (Vodacom, MTN and Cell-C). The Minister introduced the so-called Under-served Area License (USAL) to increase these penetrations. This licensing scheme had two main goals. In the first place the goal was to encourage the offering of telecommunications services in under-served areas and secondly the goal was to economically stimulate historically disadvantaged groups by setting quantitative targets on the participation of people from these groups in the labour force, the management and the share-ownership.

### **Actors**

Several actors are involved, next to the incumbent operators. First of all there is the Department of Communications (DoC). The DoC is the home of the Minister and aims on creating "...a sustainable and enabling Information and Communication Technology environment". The intention is to use this environment for socio-economic development. The DoC designs the policy in South Africa and creates bills and acts.

The regulator in South Africa is ICASA (Independent Communications Authority of South Africa). It is a converged regulator, which regulates both the broadcasting market as well as the telecommunications market. ICASA can make regulations, issue licenses, enforce compliance, decide on disputes and protect customers. Their main goal is to keep the telecommunications market healthy and promote competition, while also promoting Black Economic Empowerment.

In South Africa there also exists a Universal Service Agency (USA), which promotes, facilitates and monitors the achievement of universal service and access in under-served areas, and also manages the Universal Service Fund. All telecommunications providers deposit a percentage of their annual turnover in this fund. The revenues can then be used to promote Universal Service and Access. The USA has several projects, amongst which are telecentres (centres with telecommunications facilities in under-served areas) and the subsidies to the Under-Served Area Licensees.

Due to specific rules in the license (which will be described later), the Under-Served Area Licensees are all small companies. Most companies are established by (a cooperation of) local municipalities, who in their turn hired local entrepreneurs to govern the business. The companies have little or no experience in telecommunications and often have very little money available, while legal knowledge is limited. Therefore most sector-specific knowledge is obtained from consultants and lawyers.

### **The USAL policy**

The first draft of the policy was published in 2001 and it was amended several times since then. The final policy was not completed before the first licensing round began. Early December 2004 the first licences were signed and the final licence conditions became clear. The licence consists of a grant, several restrictions and a subsidy.

The final licence grants the licensee the right to operate a telecommunications network and provide telecommunications services in a designated area. The licensee can use any technology for their network, including fixed and mobile technologies. There can be only one licensee in every designated area, but national operators, including the four existing operators, are free to compete with the licensees. There are no rules or guidelines for interconnection, other than the fact that existing operators have an obligation to interconnect on request.

The licence is technology-neutral and allows the licensee to offer wireless services, but it does not grant the licensee the right to use the necessary frequencies. For every frequency a separate licence is needed and both the Telecommunications Act and the Licence are unclear about the pricing of this spectrum.

A remarkable feature of the licence conditions is the earlier mentioned Black Economic Empowerment. The companies bidding for a licence must be Small, Medium and Micro Enterprises (SMMEs). As much as 30% of the total issued voting share capital must be owned by local historically disadvantaged groups. Secondly, 45% of the management should consist of people from these groups. The licensees get a 15 million Rand (approximately 1.44 million Euros) subsidy, spread over 3 years, but ICASA can direct the licensee to repay this subsidy if pre-set roll-out targets are not met. The licensee is not allowed to use the licence to secure additional funding.

The licence conditions should support an economically empowering SMME to compete with the four national operators, which all have networks in (parts of) the designated areas and deliver services in high-cost areas.

### *Legislative process*

While the first licences were awarded in October 2004, the licensing process started in 2002. The first Invitation to Apply was published then, including a draft licence. In the following years, several of the licence conditions have been altered or removed, extra conditions and provisions made and subsequently removed and markets opened to other market players. We will discuss the different changes that occurred during the licensing process.

One of the most remarkable subjects concerning the licensees are the interconnection guidelines. During the process several intentional interconnection guidelines have been published by both the Ministry and ICASA. Several times there have been opportunities to respond and public hearings were held. Many of the proposed guidelines would have been beneficial for the Under-Served Area operators. At the end of the process, no guidelines were accepted and the USALs were left to their own negotiating power. It is interesting to note that at the time of writing (mid 2007) there are 'new' guidelines proposed, which are, for a major part, the same as declined guidelines published in 2004.

Voice-over-IP (VoIP) is a reasonably new technology, which can be used to provide telecommunications over relatively cheap Internet Technology hardware. Before the licensing process started, the incumbent operator Telkom was the only party allowed to use this technology. The USALs were an exceptional group, as they were allowed to use this technology as soon as they got a license. Due to pressure from the market the Department of Communications decided to open up this market in October 2004, just after the first licenses were awarded. This actually meant that any party was allowed to offer VoIP services, robbing the USALs of their advantage. Subsequently there is now a new Electronic Communications Act (formerly Convergence Bill), which fully opens the telecommunications market to new service providers and these service providers do not have restrictive license conditions about Black Economic Empowerment and Universal Service obligations. Several more issues were changed during the licensing process, but two more are worth mentioning here. USALs are allowed to provide services in the area designated in their license. Many of the USALs provide cellular (GSM) services to their customers. It is important for the licensees that their clients can cross the license area's border, without losing connection to a network. Therefore roaming agreements are made with national operators (MTN and Vodacom). Some national operators do not agree with this practice and believe that the licensees' operations should be restricted to their own area. Both ICASA and the DoC have not given definitive answers to questions about this subject. It might happen in the future that a USAL is to appear in court for providing services outside his own operating area.

As mentioned earlier the USALs are allowed to provide mobile and fixed-mobile services, for which they need frequency licenses. Use of these frequencies is not incorporated in the license. Both the DoC and ICASA have promised to deliver these frequencies but neither has given an indication of the price and availability of these frequencies, leaving a large uncertainty for the licensees.

### **Application of classical thinking**

In this section, we will apply the model shown in Figure 1 to our case.

### *Regulatory Governance*

As discussed before, regulatory governance can be split in the design and the process of governance. First we will discuss the design of the governance, by discussing the Clarity of Roles, the Autonomy and the Accountability. The design of the regulatory governance in South Africa is similar to that in

many other countries. According to the research done by (Wallsten et al., 2004) the *roles are very clear* and minister and regulator are formally separated.

The *autonomy* of ICASA is guaranteed by the ICASA Act, which establishes the powers and funding of ICASA. ICASA cannot work fully independently of political intervention for several reasons. ICASA works independent of the ministry, as its funding is appointed by Parliament. On the other side that also means that the Parliament might have some control over ICASA. In practice we have not been able to find parliamentary interventions in ICASA matters.

In case of a dispute between ICASA and market powers, there is the possibility of arbitration according to the South African Arbitration Act, which causes the decisions made by the regulator to be challengeable. Therefore ICASA is both *accountable* by the Parliament and by the arbitration possibilities.

The process of regulatory governance is another aspect. Stern and Holder operationalised the process with the concepts of Participation, Transparency and Predictability. There is a strong coherence between the design and the process and therefore some overlap exists. We will now discuss these three aspects of the governance process.

*Participation* in the regulatory process is formally described in the law. When ICASA intends to implement a new regulation, they have to publish the intended regulation well in advance with the invitation to react within a limited period of time. Any person or organisation interested in the intended regulation can then send a representation of his or her position towards the issue. At the end of the consultation period, ICASA must organise a hearing, where all parties can explain their viewpoint. After the hearing ICASA can implement the regulation, amended or unamended.

The *transparency* of the regulatory process was not defined in the original Telecommunications Act, nor in the ICASA Act. Only in the new Electronic Communications Act, which has come into effect in 2006, provisions for more transparency are included. The lack of transparency was clearly visible during the USAL process, for example around the interconnection guidelines. There was no reasoning available as to why interconnection guidelines were needed, why the published guidelines were chosen and afterwards there was no explanation why the guidelines were pulled back.

The *predictability* of the South African telecoms regulation has been very low. The lack of transparency leaves room for much speculation about the future of regulation. During the USAL process ICASA has left several issues in the unclear and some are still not clear. Examples are the roaming conditions (can a USAL roam nationally on a partners network, or can they only offer services in their designated area?) and the interconnection guidelines, which have been published and recalled several times. During the writing of this paper interconnection guidelines are on the table for discussion, once again.

To conclude we can state that the regulatory governance is largely up to standards. The regulatory governance design is as it should be, following the mainstream prescriptive theories in the field, and only in the process we can see some issues, which might cause malfunctioning.

### ***Regulatory Content***

The regulatory content is already described in the case description. Important elements are the technology-neutrality of the policy and the enforcement of Black Economic Empowerment. Other elements are the limitation of the possibilities of the USALs to get funding, the lack of interconnection guidelines, the unavailability of radio-frequency licences and the availability of new licensing schemes, which provide similar rights with much less restrictions. Some of these elements of the licence conditions have recently changed or are in the process of being changed at the time of writing.

Important to note is that some of these elements are in conflict with generally accepted views in literature. For example the Telecommunications Handbook by InfoDev states that ‘there is a consensus that *ex ante* interconnection guidelines are a necessary and effective means to promoting good interconnection agreements.’ (Intven & Tétrault, 2000, pp. 3-18) Nonetheless the Minister and ICASA have decided not to use interconnection guidelines.

To conclude, we can state that the regulatory content does not match international insights on developing markets and that the regulatory content might not reach the policy goals, as the newly created USALs are not properly supported in their struggle against the incumbents.

### ***Market Performance***

As already stated in the case description, the mobile phone penetration has risen from 17% in 2001 to 49.5% in 2006. It can thus be stated that the primary goal of the policy, which is promoting telecommunications penetration, has been reached. This is however an illusion. The raise in penetration is fully caused by the incumbent operators. The USALs are continuously on the brink of bankruptcy. A report from the Universal Service Agency<sup>1</sup> states that all USALs together currently have 17,000 subscribers, on average spending R20 (about 1.5 EUR) in six months. The same report states that 'to achieve positive earnings before interest, taxes, depreciation and amortisation in year three was unrealistic'. It is clear that the Black Economic Empowerment goal of the policy has failed and that the enormous gain in penetration is not due to the USALs.

### ***Lack of explaining power***

Even though the Regulatory Governance lives up to international standards, somehow the regulatory content and the market performance are not as expected. Where does this discrepancy come from? Theory states that if the regulatory governance is right the market performance should follow. Experiences in other countries have always supported this view. We believe that the regulatory governance as described by literature might be right for developed countries with developed markets, but in developing markets there is a need for more insight in the workings of the regulatory governance process. There is a reason for this. In developing countries skills and resources are not readily available. More than in developed countries, skills and resources are scarce goods. In the South African case the researchers have seen several cases where skills were bought away from government organisations by large firms. The skills and resources problem becomes even more important in South Africa because of the apartheid legacy.

### ***Closing the explanation gap***

In the previous section, we showed that the current models which interrelate regulatory governance and regulatory content and the recommendations regarding the design of and the process about the governance surrounding them, cannot fully explain some remarkable outcomes due to a coarse-grained set of concepts. Furthermore, it is unclear how we can change the status quo. One can recommend to some actor (the government?) to change things, but this actor can be as much a part of the problem as it is of the solution. We need a sharper analytical toolkit to explain why the regulatory governance is designed in a certain way. Only with that understanding, one can work on changing this governance.

We think that general concepts from the policy sciences can contribute to a better understanding of the phenomena perceived. We will shortly discuss three authors who provide important analytical material for our case and indicate their contribution to ours. Only in the next section we will present an enriched framework which takes these new notions into account.

Kiser and Ostrom's *Three worlds of action* (Kiser & Ostrom, 1982) sketches a metatheoretical framework that covers the full spectrum from designing institutional arrangements to actual behaviour of actors. They identify three levels of action: the constitutional choice level, the collective choice level and the operational level. At each level, a game between actors is played. These games can be analysed by looking at attributes of the decision situation as well as those pertaining to the individual decision-makers. These dependent variables help explaining actions, activities and strategies, which in turn lead to certain results. One of the factors underlying the attributes of the decision-situation are the institutional arrangements, which Kiser and Ostrom define as "...the sets of rules governing the number of decision makers, allowable actions and strategies, authorized results, transformations internal to decision situations, and linkages among decision situations." (Kiser & Ostrom, 1982, p. 191) The structure of each game is recursive. The game at the operational level is 'fed' by the outcomes of the game on the collective choice level, which resulted in a determination of the institutional arrangements for the operational level. The same holds true for the constitutional level games, which result in the institutional arrangements relevant to the collective choice level. The concept of the three games allows us to add an additional level of analysis to the framework derived from the status quo perspective. The 'constitutional' choice level leads to rules determining the regulatory governance.

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<sup>1</sup> Referred to at <http://www.iweek.co.za/ViewStory.asp?StoryID=166011>, not directly available.

[Figure 2 over here]

Figure 2 Three levels of institutional analysis. Source: Kiser & Ostrom (1982, p. 207).

Figure 2 shows the analytical elements at each level, which are identical due to the recursive nature of the model. This model can improve our understanding in two ways. First, it gives a framework for analysing games. By acknowledging that regulation processes are games, at different levels, we can open up this toolbox for a better understanding. In the example of the interconnection guidelines, we see that it are not only the institutional arrangements (regulatory governance) that are responsible for the outcomes of the collective choice level (regulatory content). Also the attributes of the community and individuals (actors) involved play a role. Secondly, the addition of a new layer, the constitutional choice level, gives an indication as to how regulatory governance can be changed. The recognition of this level and the games played there opens a new theoretical window to the literature on network formation. Two examples of theories in that strand are Bachrach & Baratz and Klein & Koppenjan. Their notions can help improve our understanding of the South African situation, in our opinion.

Figure 3 represents an enriched conceptual framework, which is a combination of the classical thinking and Kiser and Ostrom's three worlds of action.

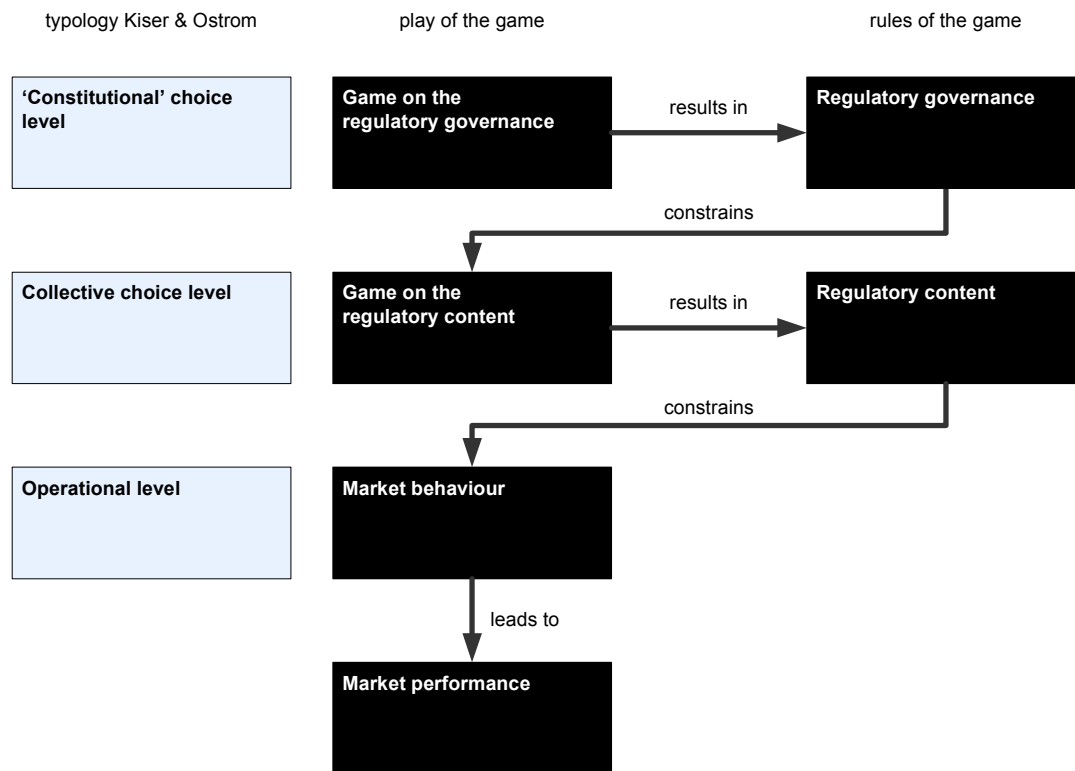


Figure 3 Proposed conceptual framework.

Bachrach & Baratz (1963) describe how non-decisionmaking (“the practice of limiting the scope of actual decisionmaking to ‘safe’ issues by manipulating the dominant community values, myths, and political institutions and procedures.”) can occur. They identify power, authority, influence and force as explanatory variables. The case of the interconnection guidelines can be explained by analysing the attributes of actors in these respects. Without making the analysing at this point, it is clear that vested interests played a significant role in the resistance of change (van Leijden & Monasso, 2005).

Koppenjan & Klijn (2000) clearly outline how structural characteristics of a policy network influence the policy outcomes. Among other things, they focus on the possibilities of network constitution: changing the network itself. They mention three possible strategies to accomplish this. First, one can change the position of actors or introduce new actors. Furthermore, the rules of the game can be changed, and finally, one can reframe, “radically change ideas about the functioning and the substantive problems of the network” (Klijn & Koppenjan, 2000). The authors warn governments for confusing different roles in a network, the roles being a hierarchical one (not participating in the network processes), a cooperative role, being a process manager and performing the task of building the network. Koppenjan & Klijn (2000, p. 145) make the very relevant remark that “Changes in the resource distribution in the networks are (...) reflected in the policy games.” Network change takes place at the constitutional choice level. At this level, we can also make use of the scientific work of North (especially North (1994)) and his views on the (difficulties of) institutional change.

### Conclusion and discussion

In this working paper, we suggested the application of theories from policy science to telecommunication regulation issues. The dominant conceptual framework in assessing telecommunication regulation has a partial mismatch with the outcomes observed, at least in our (single) South African case. The participation problem, small companies having the formal possibilities but not (being able to) use them effectively, could not be explained by mainstream prescriptive theories in the status quo. By adding Kiser & Ostrom’s three levels of institutional action, we both deepen and broaden our analytical toolkit. Notions on policy networks provide promising insights.

More deliberation on these possibilities can provide fertile ground for sharper analyses, in our opinion. As this is a working paper, we intended to provide a direction of thought, not a completely fleshed out new conceptual framework. Only after a thorough consolidation of these new insights, better practical recommendations can be made.

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