A Cross-cultural Analytical Framework for Territorial Development Policies:
The Application to Flood Risk Management Policies in the Bangkok Metropolitan Region

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ABSTRACT

This paper presents the application of a proposed analytical framework that takes cultural dimensions as main parameters to explain territorial development processes. It is illustrated through the analysis of flood risk management in two case study areas in the Bangkok Metropolitan Region. It aims to help planners and policy makers to better understand how local planning cultures should be taken into consideration in policy planning processes. The paper addresses three principal elements that are necessary for understanding relations between policy initiatives, local planning cultures and spatial development outcomes. They are (i) three facets of culture expressions relating to flood risk management – risk perception, conception on human-nature relationships and conception on human-human relationships; (ii) four fundamental factors (physical conditions, attributes of the community, formal institutions and informal institutions) and their interrelationships that condition decision-making processes; and (iii) three change-determining factors (diversity, consistency and power relations), which are crucial to determine whether and to which direction a policy initiative is followed. The empirical test of the framework shows a high level of validity and applicability to explain territorial development processes in the Thai cultural contexts.

Keywords: planning cultures; informal institutions; flood risk management; Bangkok Metropolitan Region (BMR)

INTRODUCTION

This paper is a working paper and part of a PhD research project that aims to develop an analytical framework to explain territorial development processes regarding flood risk management that takes cultural parameters as main considerations. It aims to provide development planners and policy makers with a systematic approach for policy analysis, which can apply to a cross-cultural analysis both at the cross-national and the cross-district (local) level, to better understand how planning cultures affect spatial development outcomes. This is important because previous experiences have shown that successful policy practices applied in one place do not always produce positive outcomes when applied in different contexts to deal with seemingly common problems. It is because territorial development processes are shaped not just by formal rules, such as development plans and legislations, but also significantly by local conditions, including planning cultures (Friedmann, 2005b; de Jong and Mamadouh, 2002; Sanyal, 2005; Ostrom, 2005). Based on Friedmann (2005a), ‘planning cultures’ in this context refers to common ways, both formal and informal, that territorial management is conceived, institutionalised and enacted by involved agents in a given community.
In this paper, the tentative framework is applied to explain the spatial development in two areas in the Bangkok Metropolitan Region (BMR), namely Khlongluang and Bangkoknoi-Talingchan, with which different spatial development patterns and flood risk management approaches are associated. This is to illustrate the validity and applicability of the analytical framework to explain development outcomes shaped by diverse planning cultures at the local level in accordance to a so-called common ‘national planning cultures’. The framework provides a systematic approach to understand (i) how are planning cultures expressed, (ii) what are the fundamental factors constituting decision-making processes, and (iii) what are the crucial factors determining level of policy acceptance and adaptation, which are explained accordingly in the following sections.

**Background of the case study**

The Bangkok Metropolitan Region (BMR) is located in a delta basin and has periodically experienced two main causes of floods - overbank flows caused by excessive water from upstream and excessive run-offs caused by intense local rainfalls (DDS, 2011). Khlongluang (means public canal in Thai) is a high flood-prone area, with most parts regularly experiencing both main causes of floods. The area has been reclaimed for development since 1888, yet with rapid urbanisation processes taken place just a few decades ago. Bangkoknoi-Talingchan (means little Bangkok and steep riverbank respectively), two adjacent districts, is a relatively much lower flood-prone area and more fertile. It has occasionally affected by overbank flows, only in the years with extremely large amount of water from upstream that arrived at a very high tide period, such as in 1995. The area has been dominant by low-density development with rural-agricultural characteristics since a few centuries ago.
1 EXPRESSİONS OF PLANİNG CUTILRES

1.1 Cultures as institutions and their three levels of action

The analytical framework proposes to consider cultures in terms of institutions, as it helps to understand cultures in relation to various existing literature regarding planning and other relevant disciplines (such as in de Jong and Mamadouh, 2002 and Ostrom, 2005). The term ‘institutions’ refers to ‘the prescriptions that humans use to organize all forms of repetitive and structured interactions at all scales’ (Ostrom, 2005: 3), which are classified into three levels of action.2

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1 The maps only provide information on flood exposure outside the high-density development area. The most updated data for the whole region in a digital format is available only up to 2002.

The constitutional level refers to grounded rules (such as worldviews, norms and shared values) that provide contexts in which relations take place and decisions are made. This refers to, for instance, conceptions on human-nature relationships and attitudes towards floods.

The structural level refers to organisation structures, which express in terms of economic, political and administrative systems, social structure, legislative structure and organisational relations between involved agents in a community.

The operational level refers to the whole set of exploratory activities, procedures, and techniques used within the constitutional and structural frameworks, such as spatial development patterns and flood management measures.

### 1.2 Three facets of culture expression regarding flood risk management

The analytical framework proposes to look at planning cultures regarding flood risk management using three facets - flood risk perception, conception on human-nature relationships and conception on human-human relationships. The latter two facets are constituted by two cultural dimensions, adapted from Thompson *et al.* (1990) and Hofstede and Hofstede (2005). This is to make it possible for a comparative analysis in terms of consistency across levels and agents (see more detail in Section 3).

**(i) Flood risk perception**

Based on Crichton (1999, cited in White, 2010), level of flood risk is a function of flood hazard, exposure and vulnerability. The analytical framework proposes to assess flood risk perception in terms of level of vulnerability to floods - derived from spatial development patterns created by each agent, such as land use, land coverage ratio, and building characteristics. The higher the level of vulnerability, the lower the risk perception. The level of vulnerability is then compared with the actual flood situation in the area (in terms of level of hazard and exposure) whether they are consistent.³ This paper argues that if they are consistent, it is likely that physical conditions are crucial factors constituting spatial development outcomes. See the assessment scale in Table 1.

<table>
<thead>
<tr>
<th>Hazard</th>
<th>Low</th>
<th>Medium</th>
<th>High</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Daily life disturbance with</td>
<td>Great economic loss without</td>
<td>Loss of life</td>
</tr>
<tr>
<td></td>
<td>minor economic loss</td>
<td>loss of life</td>
<td></td>
</tr>
<tr>
<td>Exposure</td>
<td>Below average (compare to the</td>
<td>Average</td>
<td>Above average</td>
</tr>
<tr>
<td></td>
<td>regional frequency)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Vulnerability</td>
<td>Liveable with floods</td>
<td>Recoverable after floods</td>
<td>Greatly damaged by flood</td>
</tr>
</tbody>
</table>

³ High consistency refers to an inverse relationship of level of vulnerability to level of hazard and exposure.
(ii) Conception on human-nature relationships (expressed as resource management typology)

This is constituted by two cultural dimensions (see Figure 2). First, level of uncertainty avoidance refers to degree of (in)tolerance of ambiguity. It ranges from uncertainty avoidance, where agents try to prevent floods, and uncertainty acceptance, where agents allow flooding and take action to manage it. Second, level of integration between human and nature refers to the ways that problems are controlled or managed. It ranges from a low level of integration with anthropocentric approach, where agents try to change the environment, and a high level of integration with social-ecological approach, where agents change their ways of interaction with nature. Examples of each management type are constructing dikes as controlling type; water pumping as manipulating type; adjusting land utilisation patterns as harmonising type; and developing ways of living or products that can function during floods, such as a house on stilts and vegetations that are tolerant to floods, as adapting type.

*Figure 2: Resource management typology according to conception on human-nature relationships*

<table>
<thead>
<tr>
<th>Challenges Management Type</th>
<th>Control (U-A)</th>
<th>Harmonise with (H-E)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Controlling problems</td>
<td>Controlling Nature</td>
<td>Harmonising with Nature</td>
</tr>
<tr>
<td>Anthropocentric approach</td>
<td>Control Nature</td>
<td>Harmonising Nature</td>
</tr>
<tr>
<td>(low integration)</td>
<td>Low integration</td>
<td>High integration</td>
</tr>
<tr>
<td>Manipulating Nature</td>
<td>Manipulating</td>
<td>Adapting to Nature</td>
</tr>
<tr>
<td>Social-ecological approach</td>
<td>Adapting</td>
<td>Adapt to Nature</td>
</tr>
<tr>
<td>(high integration)</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

(iii) Conception on human-human relationships (expressed as social organisation typology)

This is constituted by two cultural dimensions (see Figure 3). First, power distance indicates the degree of authority that agents have over others, ranging from symmetrical to asymmetrical transactions. Second, level of integration indicates the level of association between people in the community in the management of problems, ranging from individualised to collectivised.
1.3 Expressions of planning cultures in the case study

Three facets of culture expression are described according to three periods of development (see Figure 4). The early period (1782-1880) is associated with the customary ways of territorial and social organisation. The modernisation period (1880s-1990) is influenced by increases in contact with westerners and the changes in social and economic conditions, resulting in a more diverse society. The reorientation period (1990s-present) is influenced by sustainable development discourses and the marked rise of middle class, as a result of the social and economic reforms in the previous period.

Figure 4: Policy initiatives and planning cultures regarding flood risk management across agents in three periods of development in the two case study areas
Flood risk perception and conception on human-nature relationships

During the modernisation period, flood risk management approach, both in the territorial management policies and the actual development, changed towards a more anthropocentric approach with a higher level of control and lower risk perception than the traditional approach applied in the early period. An example of the changes in policy was the canalisation project with the new land development policy applied to Khlongluang during
1888-1910 (see Figure 5).\textsuperscript{4} It aimed to reclaim unattended land despite of its high flood-prone conditions, responding to the increase demand of land for cultivation generated by the free trade agreement, which began in 1855. Such changes in management approach were also depicted in the \textit{Greater Bangkok Plan 1990} (launched in 1961), as many canals were suggested to convert into roads (DTCP, 1964). Moreover, the infrastructure provision planning in the \textit{Greater Bangkok Plan 1990} and the \textit{Bangkok Land Use Plan 1992} (prepared since the 1980s) tended to promote development in high flood-prone locations, especially for the vulnerable land use types. This illustrated by the road expansion to the north and the east of Bangkok (see Figure 6).

Figure 5: Canalisation projects taking place during the modernisation period\textsuperscript{5}

\textsuperscript{4} The policy granted ownership of land to concessionaires who develop the land through canalisation, subject to whether the land has already been used and claimed (Molle, 2005). Due to its negative impacts, which enhance large landholdings, the policy was abated in 1902, and the responsibility for irrigation projects returned to the state (Molle, 2005)

\textsuperscript{5} The three zones of canalisation projects were applied by different regulations; the relevance to this discussion applied to zone 2.
Moreover, a number of flood management plans suggested constructing new water channels to divert floods, dikes along the rivers, water gates and pumping stations (as reviewed in BMA, 1986 and DDS, 1988). Still, temporary installations of sand bags, water pumps and elevated footpath during the flooding periods were employed as main measures to cope with floods in several areas in the BMR (information derived from the interviews of local officers and inhabitants, 2010). This showed a higher degree of change in policy than in the actual development.

Comparing between the two case study areas, the degree of flood risk perception and integration to nature expressed in the ways agents coped with flood risk was lower in Khlongluang. This showed in the land use patterns presenting by a high level of vulnerability, such as industrial estates and academic institutions despite of its high degree of exposure, and the major measures employed that were to raise the land and to use water pumps (information derived from the interviews of local people, 2010). On a contrary, agricultural uses (with raised-bed orchards) mixing with low density residential uses (some as a house on stilts) were still dominate in Bangkoknoi-Talingchan, despite of its lower level of flood hazard and exposure than in Khlongluang (DTCP, ---).

During the reorientation period, the awareness of flood risk and the level of integration to nature increased with a lower level of control over nature. This expressed in the Strategic Development Plan 2057 (launched in 2008) and the Bangkok Land Use Plan 2006, which include disaster prevention as an objective of land use planning and introduced a rural and
agricultural conservation and coastal preservation zones (in effect since 2007), mainly to mitigate flooding problems. See Figure 7. It also expressed in the regulation for minimum percentage of green and permeable open area required to pass the environmental impact assessment (MNRE, 1992). The spatial consequences resulted from such changes have not been obvious, but began to take place, especially in Bangkoknoi-Talingchan. Housing developers maintained a village-like and mixing-with-nature living environment weaving with existing water structure. This was not only to follow the new regulations, but also to follow a new demand of target customers.

Figure 7: Land use guidelines in the Strategic Development Plan 2057

Conception on human-human relationships

During the modernisation period, the government’s social organisation approaches changed towards a more power distance, and maintained the collectivised characteristics. This expressed in a number of spatial and water management plans associated with sector-based centralised rational planning approaches (BMA, 1986; DDS, 1988; RIDA, 1996; UN-Water, 2006). Yet, private and civic sectors seemed to keep relying on their own management, despite of the public sector’s high authorisation in flood risk management at the
time. This showed in the flood management measures prepared mostly by the developers or individuals. Instead of maintaining the traditional collectivised approach to deal with floods at the community level, each household, particularly in Khlongluang, tended to use individual measures to deal with floods, such as by raising their land elevation and temporary installation of sand bags for their house a few days before floods came (information derived from the interviews of local people, 2010).

During the reorientation period, the 1997 Constitution, the Land readjustment 2003 and the aforementioned regulations regarding green open space ratio are signs of changes towards a less power distance and less individualised management approach. 6 Slight changes can already be observed in spatial development in Bangkoknoi-Talingchan, as a rather high proportion of the land in the recent private housing estates was devoted for common green and blue areas (see Figure 8). This exemplified a likely change of institutions, particularly of private and civic sectors, towards a more collectivised management approach. It is, however, not the case in Khlongluang.

Figure 8: Housing estates constructed during the reorientation period

2 FACTORS CONSTITUTING DECISION-MAKING PROCESSES

2.1 Overall framework and four conditioned factors

The overall framework, based on the institutional analysis and development (IAD) framework (Ostrom, 2005), proposes that outcomes are the result of interactions between a set of actions (action arena in Figure 8), which are underpinned by four conditioned factors. Table 2 shows parameters for examining each factor.

(i) Physical conditions refer to attributes of the bio-physical and material world of the resource units (Ostrom, 2005), which in this case are land and water in relation to flood risk.

(ii) Attributes of the community refer to social characteristics of the agents.

(iii) Formal institutions refer to legitimised rules, laws, and government’s policies and plans.

(iv) Informal institutions refer to general accepted values, believes and worldviews.

<table>
<thead>
<tr>
<th>Physical conditions</th>
<th>Resource management (H-N relationships)</th>
<th>Social organisation (H-H relationships)</th>
</tr>
</thead>
<tbody>
<tr>
<td>land use type, land coverage patterns, plot size, flood hazard and frequency</td>
<td>- ownership of the resources</td>
<td></td>
</tr>
<tr>
<td>Attributes of community</td>
<td>- occupations in terms of connection with nature and potential loss from floods</td>
<td>- level of social divisions: authority, income, education, social status</td>
</tr>
<tr>
<td>Informal institutions</td>
<td>- land price, principles in religious, rituals, language (e.g. fundamental rules, structure, idioms, proverbs) and attitudes of different agents</td>
<td>- principles in religious, rituals, language (e.g. fundamental rules, structure, idioms, proverbs) and attitudes of different agents, such as political views, economic models</td>
</tr>
<tr>
<td>Formal institutions</td>
<td>- legitimised rules, laws, constitutions and contracts relating to land development and flood risk management</td>
<td>- involved agents and their roles and authority in land development and flood risk management</td>
</tr>
</tbody>
</table>

When outcomes are evaluated by the involved agents (based on their evaluative criteria) as productive or positive, they may increase their commitment to following the institutions that have evolved over time, and vice versa for destructive or negative outcomes. Institutions can be changed also by other factors, such as policy imposition, or by changes in other elements, such as attributes of the community and physical conditions. The concepts are graphically summarised in Figure 9.

7 The proposed analytical framework reclassifies the three factors of the IAD framework that structure actions into four factors. Rules-in-use is divided into formal and informal institutions to adapt to a main purpose of the study, which is to understand the roles of informal institutions in shaping formal institutions and spatial development patterns, and vice versa.
2.2 Local conditions and their impacts on flood risk management in the case study

This part examines crucial factors that shaped decision-makings regarding flood risk management in the two case study areas. In general, flood risk management approaches during the modernisation period changed towards a lower risk perception, a more anthropocentric with higher level of control over nature, and a more power distance with more individualised approach. This was a result of recurrent interactions of the four conditioned factors, initiated by changes in formal institutions. The gradual slave abolition (began in 1874) and the replacement of the traditional system of land ownership (to which the right to own land depends on the cultivation capacity of households) by the Torrens land title system in 1901 (Kitahara, 2000; Chitchang, 2006) were two major changes that led to changes in attributes of the community. It generated the rise of new agents connecting with economic activities that were less integrated to nature and less vulnerable to floods than farmers in the subsistence economy and nobilities under the nai-prai system\(^8\) were.

The spatial consequences created by the above changes began in Khlongluang in the 1890s soon after the canalisation projects took place there. The high flood-prone areas were reclaimed and occupied by landlords or land speculators, of which their occupations were not directly connected to the nature. The spatial impacts of such changes became more evident in the 1970s, with highly vulnerable functions and spatial patterns to floods. Examples were the initial development of public institutions and industrial uses (with government tax exemption). These vulnerable types of settlements in high flood-prone areas required a high

\(^8\) The traditional Thai feudal-like social organisation system
level of flood protection; this created an expectation of civic sector that the state would provide good flood protection measures (means a lower flood risk) to the area. This, in turn, potentially created development of high vulnerable activities by private and civic sectors, such as manufacturing factories and high-density housing estates with very low blue and green ratio (see Figure 10). This then continued as an iterative process.

Figure 10: Spatial development patterns in Khlongluang in 2010

On a contrary, low-density settlements, mainly for agricultural and residential uses, with small landholdings remained dominant in Bangkoknoi-Talingchan (see Figure 11). This was mainly because of the low level of flood prone and the fertility of the land. In summary, the primary factor shaped such different development patterns was likely to be its physical conditions, which as a result determined the agents (by occupation) and their associated planning cultures, which in turn reshaped the physical conditions to fit their development preferences. Such interacting processes replicated and reshaped development outcomes under continuously changing conditions. This explains the processes of (re)formation of different planning cultures and spatial development patterns in the two case study areas.
The rise of new agents resulted by the slave abolition and the Torrens land title system also changed the traditional communal-based type of social organisation in flood risk management into a more individualised with less power distance approach. This change had higher impacts to development in Khlongluang, which was unattended before and just been reclaimed by the emerging agents, than in Bangkoknoi-Talingchan, in which traditional agricultural-related occupations had been dominant for a few centuries. Another support was that it was more difficult to manage floods at the community level in a more individualistic society, which was the case in Khlongluang considering its attributes of the community regarding human-human relationships.

During the reorientation period, some of the government’s management policies returned, to a certain degree, to a less power distance approach. The important change-initiating factor was changes in informal institutions (influenced by sustainable development discourses), underpinned by the rise of middle class (as a result of socio-economic changes in the former period). This brought an increase in ecological and participation concerns. The new social group with a high level of ecological concerns tended to settle rather in Bangkoknoi-Talingchan, where flood risk is low and better ecological conditions are maintained, than in Khlongluang, where the high flood prone conditions were compensated by low price of land. In summary, physical conditions were the crucial factors determining location choices of each social group, which is associated with particular planning cultures;
and in turn, the agents shaped spatial patterns according to their planning cultures. This describes why housing estates in Khlongluang was developed with the highest density as allowed by the Building Ordinance, in a way that very low values were given to environmental aspects (derived from a field survey).

3 DETERMINING FACTORS FOR POLICY ACCEPTANCE

3.1 Three change-determining factors

Based on Gullestrup (2006), there are three main factors that determine whether and to which direction a policy initiative (a change-initiating factor or CiF in Figure 12) will be accepted or adapted.9 The summarised relationship of these factors is illustrated in Figure 12.

Figure 12: A summarised diagram of relationships between the three determining factors

(i) Degree of diversity: The more diverse knowledge, experience and practical skills the community associated with, the more chances for policy initiatives to penetrate into and reach the stage that the policy initiatives can (but may or may not) be accepted by the community, and be put into practice (Gullestrup, 2006).

(ii) Degree of consistency: The more consistent the institutions across agents and levels, the higher tendency the policy initiatives will be reacted, either positively or negatively, corresponding with contents of the policy initiatives (Gullestrup, 2006).

(iii) Internal power relations: The higher the correspondence between policy initiatives and the existing institutional settings of the most powerful agents (in terms of an influence to

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9 The original concept proposed by Gullestrup (2006) is that the probability that a culture change will take place depends strongly on (i) degree of homogeneity, (ii) degree of integration, (iii) content of the change-initiating factors and (iv) internal power relations.
the decision-making processes), the higher probability of positive reactions can be expected (Gullestrup, 2006). This factor plays a significant role if a high inconsistency exists across agents.

3.2 Local cultures and their responses to the policy initiatives

This part uses the three change-determining factors to explain the way the policy initiatives were responded in each case study area. It focuses on explaining two main issues.

(i) The changes in resource management approach

The canalisation projects represented the change towards a more anthropocentric approach with a higher level of control over nature. The projects took place in Khlongluang, where more diverse agents (in terms of occupations and institutions) involved in development processes (Molle, 2007), and not in Bangkoknoi-Talingchan, where the existing community was more uniform, underpinned mainly by agricultural-based occupations, and the associated planning cultures were not consistent with the content of the policy initiatives (Molle et al., 1999).

Concerning the reoriented approach towards a lower level of control over nature and more integration to nature, the most crucial factor determining the response to the policy initiatives was the internal power relation. The most influential agents in the reorientation period were potential inhabitants (most are immigrants from other places), which differed from the landowner in the previous period. Effects on spatial development outcomes caused by the reoriented management approach are more evident in Bangkoknoi-Talingchan because of the high level of consistency between the content of the policy initiatives and the informal institutions of both the existing and the potential inhabitants (the upper middle class that essentially precipitated sustainable development discourses into development policy reformation processes). This process has not clearly taken place in Khlongluang due to the inconsistency of informal institutions of the existing inhabitants, influenced by the physical conditions of the area, as explained in Section 2.2.

(ii) The changes in social organisation approach

The centralised and sector-based management approach illustrated the changes towards a hierarchical approach in the modernisation period. This change was well accepted by the state mainly because its content was quite consistent to the informal institutions of the aristocrats (with a high level of power distance), who were the most influential agents in policy planning during the modernisation period (Phongpaichit and Baker, 1995). However, it was rather consistent with the traditional social organisation type embedded in the old settlements, such
as in Bang koknoi-Talingchan, where the communal approach was applied (Askew, 2000), underpinned by the attributes of an agriculture-based society together with the existing physical structure of the area (such as the weaving canal networks).

**Summary**

The consistency between the content of the policy initiative and the informal institutions of the most influential agents tends to be the most significant factor to determine the way in which a policy is shaped in the context of the case study. Diversity plays a significant role not at the local level, but at the level of national policy (re)formation. This insignificant role at the local level of the diversity might explain by the very strong physical conditions regarding flood risk aspects of the two case study areas that draw agents with rather uniform attributes to each area. The degree of diversity regarding the agents’ level of connection with the nature is therefore rather low. Such assumption should be further investigated in the areas which share common physical conditions, but associated with highly diverse attributes of the community.

**4 CONCLUSIONS AND REMARKS:**

**Implications of local planning cultures in territorial development processes**

The analysis shows a high level of validity and applicability of the proposed analytical framework to explain territorial development processes from a cultural perspective, with respects to flood risk management in the case study areas. The three facets of culture expression provide a simplified tool that helps comparing and understanding complexities of territorial management. The three change-determining factors also well explain why policy initiatives were applied to some places and not others; the key word is ‘consistency’ with local planning cultures.

Furthermore, the four conditioned factors help explaining the diverse local planning cultures (re)formations and the spatial development outcomes in the case study areas. The results show a high level of interrelationships between the four factors. Informal institutions seem strongly correlating with attributes of the community, regarding their connection to the nature. Attributes of the community tend to strongly relate to the physical conditions, with a less significant relation to formal institutions. In other words, the results illustrate a higher level of significance of physical conditions and attributes of the community to determine location preferences and to shape decision-making processes regarding flood risk management over formal institutions (see Section 2.2 for more detailed explanation). These are two-way relationships, i.e. informal institutions are shaped by other three conditioned factors, and in turn they also reshape the three factors. In conclusion, changing flood risk
management policies tends to be a less powerful measure to trigger changes in informal institutions than changing physical conditions and/or attributes of the community in a way that induces changes towards the intended policies.

Finally, it should be noted that some elements in the proposed analytical framework were not employed in this paper, mainly due to the limitation of data and the complexity of the framework that requires a certain level of simplification for an initial test. The main remark is that in this paper informal institutions are derived from an assumption that they are highly correlated with attributes of the community, and therefore uniform within a particular social group; the social groups are classified based on their connection to the nature only, and not on other socio-economic aspects as stated in Table 2). This assumption and limitation should be tested and expanded using interviews and questionnaires. Other elements that should also be included in further study are different effects potentially created by endogenous and exogenous change-initiating factors and different levels of action of which the change takes place.

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