

## Adaptive governance in the developing world: disaster risk reduction in the State of Odisha, India

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## RESEARCH ARTICLE

### Adaptive governance in the developing world: disaster risk reduction in the State of Odisha, India

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Under what conditions do governments turn to adaptive governance systems? This paper explores a success case of adaptive governance in a non-western country and tries to understand what factors lead to the adoption of this type of governance. Adaptive governance is considered most efficient to address the many challenges of climate change and natural disasters because it embraces uncertainty by focusing on collaboration, flexibility and learning. Yet, the concept remains underdeveloped and the conditions under which governments decide to embrace adaptive governance are not clear. The paper argues that two main factors are crucial for governments to turn to adaptive governance. First, a traumatic shock is likely to stimulate a reconsideration of the manner in which governance is thought and applied. The shock by involving considerable economic and human cost creates a momentum for governance rethinking. Second, a committed political leadership is essential to make use of that momentum to reform previous governance practices to create a more resilient system. These arguments are explored in the case of Odisha, an Indian state that was able to adopt adaptive governance and that became a successful example of disaster risk reduction and climate change adaptation.

**Keywords:** adaptation; governance; cyclones; India; resilience

#### 1. Introduction

Under what conditions do governments turn to adaptive governance systems? The objective of this article is twofold. First, it presents a success case of adaptive governance in a non-western country. Second, it suggests two factors that may have led to the adoption of this type of governance. The importance of adaptive governance is widely acknowledged and highlighted in the domain of climate change adaptation, disaster risk reduction (DRR) and ecosystem resources management (cf. Chaffin, Gosnell, & Cosens, 2014; Dietz, Ostrom, & Stern, 2003; Foerster, 2011; Munaretto, Siciliano, & Turvani, 2014). The challenge of addressing climate change and natural disasters is so immense that no single agency can handle it alone, which requires broader types of governance that can better deal with uncertainty. Adaptive governance framework relies on the collaboration of a diverse set of stakeholders operating at different social and ecological scales in multilevel institutions and organizations (Olsson, Folke, & Berkes, 2004). Adaptive governance, sometimes called adaptive co-management or polycentric governance,<sup>1</sup> is based on the idea that governance systems should have the ability to change practices following new insights and experiences and therefore be capable to effectively respond to change and uncertainty (Shinn, 2016).

According to existing research on environmental governance, systems that embrace adaptive governance are more resilient to climate change than other systems because they are more capable to handle uncertainty (cf. Bakker & Morinville, 2013; Bogardi et al., 2012; Huitema et al., 2009; Pahl-Wostl & Knieper, 2014).

While there is increasingly more research on the topic, the literature on adaptive governance suffers from some shortcomings. First, these theorizations tend to neglect many of the on-the-ground realities and pay little attention to the implementation of adaptive governance systems (Shinn, 2016). Second, the growing literature on adaptive governance has been scarce on examples of functioning adaptive systems, particularly in developing countries. In other words, it is not clear whether adaptive governance can work for countries where the state has limited resources and reach, as the concept has been mainly developed and applied in industrialized countries (Chaffin et al., 2014; Hermansson, 2016; Karpouzoglou, Dewulf, & Clark, 2016). Indeed, the application of the concept has been found more problematic in developing countries (cf. Shinn, 2016). Finally, it remains uncertain under what conditions governments shift from conventional governance systems to more adaptive ones (Manyena, Mavhura, Muzenda, & Mabaso, 2013).

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This article addresses these three gaps in previous research using empirical evidence from Odisha, a state in India that has adopted many principles of adaptive governance and which is considered as a success case in terms of DRR and climate change adaptation (World Bank, 2013). Indeed, the state of Odisha was well prepared when cyclone Phailin made its landfall on the coast of Odisha, and very few people died from the disaster. To explore the conditions under which governments turn to adaptive governance systems, the paper empirically examines the Odisha success story and provides on-the-ground evidence of adaptive governance. Second, it tries to explain this success of governance through two main factors: traumatic shock and committed political leadership. It argues that a traumatic shock, by involving considerable economic and human cost, creates a momentum for governance rethinking. It provides an opportunity for committed political leadership to reform previous governance practices in order to create a more resilient system.

By examining a success case of adaptive governance and tracing the conditions that have led the government to adopt such a governance system, the study contributes to the theoretical discussion on the feasibility and applicability of adaptive governance. Previous research is rich with failed cases of DRR from which lessons are drawn, this paper, however, explores a success case, providing avenues for other countries with similar socio-economic situations to rethink their governance systems.

The main source of empirical evidence from this paper is derived from semi-structured interviews with representatives of government, local communities, NGOs and International Organizations, and disaster victims in the State of Odisha in October and November 2014. Through process-tracing, the paper found evidence of the suggested causal mechanisms linking traumatic events and political leadership with adaptive governance.

This paper is organized as follows. The next section reviews previous research on adaptive governance and related concepts. It then develops theoretical arguments to explore the conditions under which governments shift to more adaptive types of governance. Following this section, the method adopted to explore the theoretical argument is discussed. This is followed by the analysis of the case study in Odisha. The final section discusses the findings and provides a conclusion.

## 2. A review of adaptive approaches to governance

The concept of adaptive governance literature finds its roots in the work on socio-ecological systems and adaptive management. Holling (1973) argued that management needed to be able to learn and adapt. This idea describes management as a set of adaptive cycles and multiple connections between changes that differ in speed and scale (Djalante, Holley, Thomalla, & Carnegie,

2013). The term is also present in the work of Olsson et al. (2004) on co-management, which common principles include a management process that is dynamic, multilevel and polycentric (Folke, Hahn, Olsson, & Norberg, 2005; Olsson et al., 2004). This literature argues that changes within the environment are becoming more complex and thus management systems need to be able to learn from and adapt to change (Folke, 2006). In practice, adaptive co-management “relies on the collaboration of a diverse set of stakeholders operating at different levels, often in networks, from local users, to municipalities, to regional and national organizations, and also to international bodies” (Olsson et al., 2004, p. 76). These governance frameworks rely on the collaboration of a diverse set of stakeholders operating at different social and ecological scales in multi-level institutions and organizations (Olsson et al., 2004). Individual actors play essential roles in providing, e.g. leadership, trust, vision and meaning (Olsson et al., 2004). While co-management may imply the creation of new institutions, organizational change within existing institutions may be encouraged (Olsson et al., 2004).

Adaptive governance is also a central concept in the work of Ostrom on the management of common pool resources. Expanding her common pool resources management to larger systems such as climate change governance, Dietz et al. (2003) suggest five requirements for adaptive governance. These include the provision of information, conflict resolution, induce rule compliance, infrastructure provision and the encouragement of adaptation. They encourage a strong focus on polycentric institutions that facilitate experimentation, learning and change (Dietz et al., 2003).

The related concept of polycentric governance was elaborated in the 1960s and is characterized by multiple governing authorities at differing scales rather than a mono-centric unit (Ostrom, 2010). Each unit within a polycentric system exercises independence to make norms and rules within a specific domain (Ostrom, 2010). Participants in a polycentric system have the advantage of using local knowledge and mechanisms for mutual monitoring, learning and adaptation of better strategies over time (Ostrom, 2010). Ostrom argues that this encourages experimentation by multiple actors, as well as the development of methods for assessing the benefits and costs of policies (2010). The polycentric approach to governance embraces complexity and uses it as a way to make decisions, rather than as an excuse for inaction (Bakker & Morinville, 2013). It is argued that these systems are more resilient to climate change than mono-centric systems because they are better equipped to respond effectively to uncertainty (Bakker & Morinville, 2013; Bogardi et al., 2012; Huitema et al., 2009; Pahl-Wostl & Knieper, 2014).

In ecosystem management in Sweden and Australia, Schultz, Folke, Österblom, and Olsson (2015) demonstrate

how adaptive governance enables collaboration across diverse interests, sectors and institutional arrangements. The added value of adaptive governance compared to other type of collaborative system is that it aims “to expand the focus from the management of ecosystems towards addressing the complexity of ‘broader social contexts’ within which people make decisions and share power” (Dietz et al., 2003; Duit & Galaz, 2008; Folke et al., 2005; Karpouzoglou et al., 2016).

This openness to theoretical multiplicity has demonstrated a better and more reflexive evaluation of important governance features such as power and politics, inclusion and equity (Karpouzoglou et al., 2016). This multi-perspective approach might therefore enable conceptual and knowledge gaps to be addressed through reference to other theories but without trying to integrate every theory under one paradigm (Karpouzoglou et al., 2016). At the same time, adaptive governance literature has been criticized for being too conceptual, normatively tainted and to have a limited ability to address real-world problems (Shinn, 2016; Karpouzoglou et al., 2016).

While adaptive governance is used differently in the previous literature, it shares many elements. These include polycentric and multilayered institutions, collaboration and conflict resolution, self-organization and networks, and learning and innovation. Operationalizing the main elements of adaptive governance is important as existing research argue that there is a need for more systematic research on how the concept is used and applied in the ground, particularly in developing countries that have limited resources and are highly exposed to environmental change (Karpouzoglou et al., 2016). Some studies suggest that adaptive governance often lacks attention to important on-the-ground realities, such as power dynamics (Shinn, 2016; Bakker & Morinville, 2013) and issues of implementation (Bakker & Morinville, 2013). According to Karpouzoglou et al. (2016), “there is considerable scope for taking theoretically and conceptually developed work on adaptive governance in the Global North and evaluating the extent to which it can be applied in the context of the Global South”. The majority of studies have evaluated the adaptive governance concept in the area of water management. Particularly, prominent thematic areas on water included, for instance, trans-boundary water resources governance (Akamani & Wilson, 2011), management of river basins (Bakker & Morinville, 2013; Foerster, 2011; Mandarano & Mason, 2013; Schultz et al., 2015), groundwater and ecosystem services (Knüppe and Pahl-Wostl, 2013) and integrated water resource management (Herrfahrdt-Pähle, 2013; Rouillard, Heal, Ball, & Reeves, 2013). While the majority of studies have evaluated the adaptive governance concept in the area of water management and other ecosystems, fewer studies have explored adaptive governance for DRR (Djalante et al., 2013). And although the concept

is being mentioned in the official document such as the Sendai Framework for DRR, it remains rarely explored on the ground and very few empirical examples are provided. More particularly, the conditions under which governments decide to shift to more adaptive governance principles remain unclear. Exploring the “windows of opportunity” that makes the emergence of adaptive governance more likely is an important avenue for future research suggested by Chaffin et al. (2014) in their review of existing research on adaptive governance.

Against this backdrop, this paper offers empirically grounded insights of a case of adaptive governance in the field of DRR and explores how the state of Odisha has shifted to a more adaptive form of governance. In doing so, it suggests two main factors that likely to lead to the adherence of adaptive governance principles: a traumatic shock and a committed political leadership pushing for change. It focuses on these two factors because they have been found important for triggering other types of policy change. The next section reviews the literature on the emergence of new modes of governing and indicates that external shocks and committed political leadership are indeed two significant factors that explain why governments turn to adaptive governance systems.

### 3. Triggers of adaptive governance

#### 3.1. External shocks

In public administration research, shocks have been found to trigger policy change (Olson & Gawronski, 2003, 2010; Sabatier & Jenkins-Smith, 1993; Schlager, 1995). According to the advocacy coalition framework, an external event might stimulate a process of experiential learning by which coalition members seek a better understanding of the world in order to further their policy beliefs (Nohrstedt, 2005). Thus, an external shock may lead to policy change through four mechanisms. It creates major socio-economic changes, public opinion shifts, changes in the system governing coalition, and policy decisions and impacts from other subsystems (Sabatier & Jenkins-Smith, 1993). These perturbations are likely to open new opportunities for governance rethinking. While external shocks are not the only reasons for explaining policy change initiatives, they are likely to play a higher role when the external shock is extremely devastating. Sabatier and Jenkins-Smith (1993, p. 34) contend that major policy change will not occur in the absence of “significant perturbations external to the subsystem”. Similarly, Olson and Gawronski (2003, 2010) argue that natural disasters are “critical junctures” that have the potential to alter the historical trajectories of governance. In his book on disaster and development, Cuny (1983) suggested that natural disasters are likely to mobilize civil societies and bring about new leaders that might “replace those who have

proved ineffective or unable to cope with the aftermath of a disaster” (Cuny, 1983, pp. 11–13 quoted in Pelling & Dill, 2010).

Research in civil war negotiation also claims that shocks can open new opportunities for conflict resolution, as they “jolts the mind and stimulates rethinking” (Bercovitch, Diehl, & Goertz, 1997). External shocks such as natural disasters force decision makers to think about larger issues such as whether the conflict is worth the sacrifices it produces (Pruitt, 2005). In a similar vein, Zartman argues that that ripeness is enhanced in the wake of an “impeding catastrophe” (2000). Catastrophes may produce new optimism about finding a way out of armed conflict and to enter peace negotiation. Building on ripeness theory, Kreutz (2012) found an increased likelihood of ceasefires following natural disasters. The most known example of a natural disaster that led to a peace agreement is the case of the civil conflict in the region of Aceh in Indonesia following the 2004 Indian Ocean Tsunami (Gaillard, Clavé, & Kelman, 2008).

There is evidence that critical events (such as a devastating natural disaster) can be policy windows that allow proponents of change to assert their political leadership by advancing new alternatives to old problems. Research on adaptive pathway provide insight into the sequencing of actions over time which are usually triggered by a shock (Hassnoot, Kwakkel, Walker, & ter Maat, 2013). Yet, not all disasters trigger policy changes and the link between external events and policy change initiatives is more complex than a simple stimuli–response sequence (Nohrstedt, 2005). While disaster gives a momentum to rethink previous policies, the presence of political leadership is crucial to produce policy change.

### **3.2. Committed political leadership**

Shocks are “necessary but insufficient” triggers for policy change if there is no political leadership to act upon it. Leadership is a critical element in preparing a governance system for change (Olsson et al., 2006). Shocks are more likely to bring about a rethinking of governance particularly when they are picked up by policy leaders who have sufficient political control and popular support to put forward new policies. Policy entrepreneurs can convince their constituencies that learning from these failures requires an innovative approach to governance. Olsson et al. (2004) indicate in their study that leaders often initiate key processes that are required in ecosystem management, serving as key players in institution building and organizational change. Ostrom (1990) contends that leadership can be crucial for conflict resolution and institution building. This article examines formal leaders, those persons who are elected and have the legitimate right to make decisions and that have control over critical resources in terms of both finance and expertise.

Yet, these leaders need to be trusted by the people to be able to bring about change. Trust is an essential characteristic of governance change as it makes the collaboration easier to undertake between different institutions and sectors of society (Pretty & Ward, 2001). According to Olsson et al. (2004), most cases of successful co-management are often preceded by long periods of trust building.

Leaders that can foment trust building are essential for collaborative processes, as they represent the lubricant and the glue that hold collaboration (Hermansson, 2016). Trust towards leaders is a process that may have varying degrees that are built over time in lights of the efforts made by the political leaders to improve the welfare of the population. Political leaders build their popular trust by sharing information and knowledge and demonstrating competency, good intentions and follow-through (Bryson, Crosby, & Stone, 2006). Mayors and other official leaders have been found to play a significant role in promoting governance change and participatory initiatives. Hence, trusted and legitimate leaders are needed to successfully implement adaptive governance policies.

While this section has highlighted traumatic shock and committed political leadership as important for triggering policy change, the next section presents the method used to explore these factors in the case study of Odisha.

## **4. Methods**

### **4.1. Case selection and description**

The state of Odisha is one of the poorest states in India, where 47% of the population lives under the poverty line of two dollars a day. While Odisha has seen a sharp decline in poverty in the past decade, poverty remains high and the state has some of the poorest districts in the country (World Bank, 2016). The state of Odisha has a large tribal population, which tend to rank lower in terms of education, health and employment (World Bank, 2016). Odisha’s economy is driven by its natural resources and agriculture. Half of Odisha’s people work in farming (World Bank, 2016). According to the 2011 census, female literacy in Odisha is of 64% compared to 82% for male literacy. While there is some improvement in recent years, gender issues in Odisha remain an important development concern (World Bank, 2016).

Odisha is one of the most exposed Indian states to natural hazards, particularly to cyclones due to its sub-tropical littoral location (OSDMA, 2016). Despite this high level of vulnerability, Odisha has been successful in managing natural disasters as demonstrated during cyclone Phailin, a very severe tropical storm where the number of casualties was kept to a minimum. Much learning was done since the 1999 cyclone and the state has a good institutional setting to address disaster risk. The case of Odisha is chosen because it an “illustrative” case of functioning

adaptive governance (Seawright & Gerring, 2008). It is also a well-suited case because it allows to trace the policy change over time, from 1999 until today, and assess whether the two independent variables – traumatic shock and committed political leadership – played a role in adaptive governance.

#### 4.2. Data collection and analysis

This study uses the method of process-tracing to investigate whether traumatic shocks and committed political leadership have led to a change in governance in Odisha. The focus of this paper is therefore on studying causal mechanisms using in-depth single case study. Given that this paper attempts to establish sequential steps from cause to effect, process-tracing is a very useful method. It is a well-suited method because it “attempts to identify the intervening causal process – the causal chain and causal mechanism – between an independent variable (or variables) and the outcome of the dependent variable” (George & Bennett, 2005, pp. 206–207).

The main part of the empirical content consists of primary interview data of 47 people in Odisha who have been involved directly or indirectly in the prevention,

preparedness, response, and recovery efforts following the 1999 typhoon and the 2013 typhoon Phailin. While interviews with state representatives and international NGOs staff were done in English, interviews with local communities and NGOs were done in Oriya (the local language of Odisha). A research assistant from Berhampur college helped me to get access to communities and translate during the interviews and the focus group discussions done in the local language.

The respondents were approached through the author’s network and “snowball sampling” (Biernacki & Waldorf, 1981). While this method can limit generability and bias sample because access to respondents is contingent on existing networks, personal referrals often provide the only access to respondent, especially in developing countries (Cammatt, 2006). My research assistant played an important role in introducing me to coastal communities that were heavily affected by both typhoons. Having said that, the study has tried to capture a broad sample of respondents with different background and views in order to get a holistic picture of the situation.

The background and affiliations of the informants are presented in Table 1, as well as the interview locations in Figure 1. As such, these interviews provide critical insights

Table 1. List of people interviewed.

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#### *Government of Odisha officials*

Director (retired) of Odisha State Disaster Management (OSDMA), Odisha State Government, November 2014, Bhubaneswar.  
 District Collector of Ganjam, Odisha State Government, November 2014, Bhubaneswar.  
 Emergency Responder at Odisha Disaster Rapid Action Force (ODRAF), Odisha State Government, October 2014, Bhubaneswar.  
 Deputy Relief Commissioner, Odisha State Government, October 2014, Bhubaneswar.  
 Managing Director of Odisha State Disaster Management (OSDMA), Odisha State Government, November 2014, Bhubaneswar.  
 Engineer-in-Chief, State Disaster Management (OSDMA), Odisha State Government, November 2014, Bhubaneswar.  
 Secretary, Panchayati Raj, Government of Odisha, November 2014, Bhubaneswar.  
 Block Development Officer of Aryapalli, Government of Odisha, November 2014, Aryapalli.  
 Block Development Officers of Podampetta, Government of Odisha, November 2014, Podampetta.  
 Gram Panchayat of Basanaputi, Government of Odisha, November 2014, Basanaputi.  
 Zila Parishad of Ganjam district, Government of Odisha, November 2014, Berhampur.

#### *International organization and non-governmental organization (INGOs)*

State Director, UNDP Odisha, November 2014, Bhubaneswar.  
 Consultant, the World Bank, November 2014, Bhubaneswar.  
 UN Special Representative for Disaster Risk Reduction, September 2014, UNISDR, Geneva.  
 Social Development Specialist, the World Bank, November 2014, Bhubaneswar.  
 Chief of the Red Cross Odisha, The International Federation of the Red Cross (IFRC), October 2014, Bhubaneswar.  
 Humanitarian officer, UNOCHA, November 2014, Bhubaneswar.  
 Managing Director, Oxfam India, November 2014, Bhubaneswar.

#### *Local NGOs and community organizations*

Director, Indian Society for Rural Development, November 2014 Gopalpur.  
 Coordinator, Inter-Agency Group, November 2014, Bhubaneswar.  
 Coordinator, Shelter Management Committee, Aryapalli.  
 Representative, Fishman folks organization, November 2014, Podampetta.

#### *Focus group discussions*

Disaster evacuees and victims (7 persons), October 2014, Podampetta.  
 Disaster evacuees and victims (3 persons), October 2014, Aryapalli.  
 Disaster evacuees and victims (13 persons), October 2014, Badaputi.  
 Disaster evacuees and victims (4 persons), October 2014, Basanaputi.

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### Interviews location in Odisha

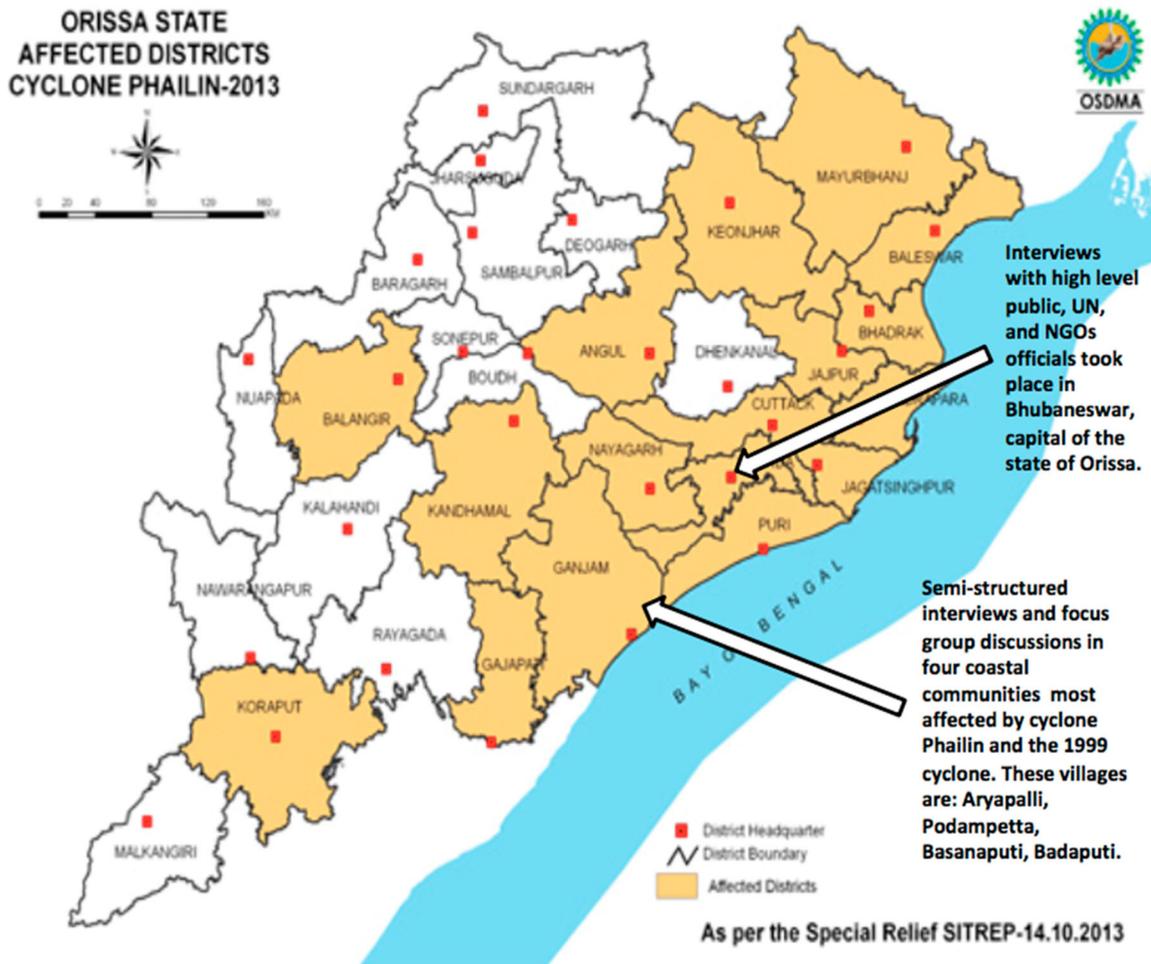


Figure 1. Interviews location in Odisha.  
Source: Adapted from Odisha State Disaster Management Authority (2013).

from both government officials and community dwellers of the factors that lead the government of Odisha to invest in adaptive governance. It also shows how adaptive governance for DRR was implemented and how efficient it was to reduce the loss from natural disasters. I conducted fieldwork in Odisha during November and October 2014. The interviews were semi-structured, meaning that while some essential questions were asked, interviewees had the freedom to guide the discussion in the direction wished. Some of the recurrent questions asked to the respondents were

- How traumatic was the 1999 cyclone and to what extent and how did it lead to a change of behaviour/policy change in the state of Odisha?
- What was the difference between the government preparedness and relief in 1999 and 2013? What was the most significant change?
- How would you rate the government in 1999 and the one today in terms of DRR?

- Is collaboration between the different levels of government more effective than before? Can you give me a precise example of collaboration between a local organization and a state department?
- Does the government listen to your concerns and adopt measures accordingly?

On average, interviews lasted from one to three hours. The four focus group discussions lasted for two hours each. The vast majority of the respondents preferred to talk anonymously to me, their names are therefore not provided in this paper. The sample of people interviewed does not relate to the broader population from which it is drawn. Given that the focus of the paper is to understand policy change, government officials are overly represented in the interview sample. However, for focus group discussion, the sample is more representative of the broader population. In addition to interviews and focus group discussions, secondary documents such as policy papers or newspaper articles are also used in this paper.

## 5. Results

This section starts by providing some context on the cyclones and on adaptive governance in Odisha. Second, it explores whether external shocks and committed political leadership have played a role in the government decision to shift to adaptive governance. By doing so, this section examines the different components of adaptive governance in Odisha and how successful these efforts were to reduce disaster risk.

### 5.1. Context

On 12 October 2013, Cyclone Phailin, a very severe cyclonic storm with winds of 220 km/h made its landfall on the coast of Ganjam district and heavily affected more than 30,000 villages in the state of Odisha, one of the poorest and most disaster-prone regions in India. The damage was created by strong winds, a 3.5-m storm surge, and torrential rainfall following the cyclone. Despite heavy damage to houses, agricultural lands, infrastructure (telecommunication towers, roads, bridges, government buildings, etc.), which affected 11 million people, only 23 people were killed by the cyclone (World Bank, 2013). The low level of fatalities in comparison to the strength of the cyclone is attributed to effective measures from the government of Odisha and local communities in reducing disaster risk.<sup>2</sup> As a preparedness measure, the government was able to evacuate almost a million people in less than two days, one of the largest pre-emptive evacuations in the world (World Bank, 2013). This evacuation saved many lives and was only possible through a close collaboration between local officials, civil society networks and the citizens.<sup>3</sup> These successful efforts in DRR were praised by the World Bank, the United Nations and many International Non-Governmental Organizations (World Bank, 2013). The DRR measures done by the state of Odisha ahead of Cyclone Phailin were highlighted as a global example during the third World Conference on Disaster Risk Reduction that took place in Sendai during 2015. The Odisha success story in DRR has become an example for other regions of low socio-economic status dealing with natural disasters, indicating that poor regions if properly organized can reduce disaster risk.

This surprising level of resilience in one of the poorest states in India did not happen overnight. Following the 1999 cyclones that killed more than 10,000 people in Odisha, the government of Odisha decided to shift to a more adaptive type of governance allowing more flexibility to reduce the impact of natural disasters and climate change. In light of previous research, I argue that two factors – traumatic shock and committed political leadership – explain this shift to adaptive governance. The period between the 1990 cyclone and Cyclone Phailin in 2013 is characterized

by a series of reforms, including the creation of new institutions, the construction of disaster risk mitigation infrastructure and the creation of a stronger relationship between local authorities and community-based local organizations.

### 5.2. Traumatic shock

The 1999 cyclone that killed more than 10,000 people in Odisha was a traumatic shock that led to important reforms at the national and state level. The storm affected 19 million people in almost 18,000 villages in 12 districts in Odisha. The Odisha government was severely criticized for its apparent lack of preparedness and inadequate response to the cyclone (Thomalla & Schmuck, 2004). The initial impact of the cyclone led to a significant breakdown of the Odisha government infrastructure and communication systems for a period of up to two weeks and the recovery was slow due to weak political leadership (Thomalla & Schmuck, 2004). The cyclone prompted national and international organizations to initiate comprehensive DRR programmes in the area and a new leadership took over the government of Odisha.

Before the 1999 shock, very few NGOs and national programmes were engaged in DRR. The 1999 cyclone was a turning point for the state government and the international NGOs operating in the regions. The incumbent government lost the election mainly due to its failure in disaster response and the new administration put forward an ambitious plan to make Odisha more resilient to natural disaster. Before the 1999 cyclone, there was very little coordination between the state government and the NGOs. Because of the lack of leadership and guidance from the state government following the 1999 cyclone, the relief and rehabilitation efforts were in many cases chaotic. For example, aid agencies had to decide for themselves what kind of materials should be distributed and which communities should be prioritized, leading to many regional disparities and duplications of efforts (Thomalla & Schmuck, 2004).

The tremendous 1999 shock made apparent the failure of the institutional setting of the state in disaster management and it created a momentum to establish new institutions. The creation of OSDMA was a direct response in providing an institution that could lead DRR efforts at the state level.<sup>4</sup> The 1999 cyclone triggered a long-term, strategic plan to promote DRR in all the levels of society in Odisha. The newly established OSDMA was created to increase community resilience, to promote a culture of preparedness towards natural and man-made disasters and to coordinate the activities of NGOs and other humanitarian organizations. OSDMA was built keeping in mind the lessons from the 1999 cyclone, combining the building of infrastructures such as cyclone shelters with vast capacity building and awareness raising programmes in disaster

risk reduction, such as Community-based Disaster Preparedness Plans.<sup>5</sup>

In fact, the 1999 cyclone started a cycle of reflections on what went wrong inside the government and among the population in Odisha. The first director of the OSDMA (today retired) declared that everyone in the new agency was eager to learn about past mistakes, “Where do we make mistake? Where can we improve? What is the most needed investment? Several new institutions were created as result of the lessons learned from the 1999 cyclone”.<sup>6</sup> Since its creation, OSDMA has encouraged learning and innovation, and has invested in both structural non-structural measures to reduce disasters risk learning from training and experience over the years. In terms of structural measures, much was learned from the potential of cyclone shelters to save human lives during previous disasters.

The 23 cyclones shelters during the 1999 cyclone reportedly saved more than 42 000 lives. If they were more shelters, much more people would have been saved, as many people died due to a lack of safe shelter in 1999. This was an important lesson and an eye opener for our new government, which decided to invest in the construction of multi-purposes cyclone shelters, with financing from the World Bank and the national government.<sup>7</sup>

The aftermath of the 1999 cyclone, in fact, touched the very conscience of our welfare state and virtually instructed us to make much efforts to strengthen the institutional mechanism, response capacities and financial arrangements for different activities relating to disaster management.<sup>8</sup>

He continues saying that: “the 1999 catastrophe led to the creation of the OSDMA which promoted multi-level links between different departments and across local communities to make the state more prepared for handling such unfortunate disasters in the future”.<sup>9</sup> OSDMA was the first full-fledged specialized authority in disaster management in the country. It was created even before the National Disaster Management Authority (NDMA) set up in 2006.<sup>10</sup> The 1999 shock had also some important consequences at the national level triggering debate regarding the adoption of an adequate institutional setting for disaster management. This led to the drafting and adoption of the National Disaster Management Act 2005, which underscored the need to have a multi-sectorial and multidisciplinary approach to disaster management.

At the community level, the shock from the 1999 cyclone clearly raised the importance of DRR. The involvement of local communities in the planning process and maintaining hazard awareness came naturally.<sup>11</sup> This was clearly highlighted by the prompt evacuation of a million people ahead of cyclone Phailin. While the traumatic shock of the 1999 typhoon increased the level of collaboration between the state representatives and community organization, it took time for communities to trust a state

that was little responsive to their needs.<sup>12</sup> With the change of government following the 1999 cyclone and an increased commitment to reach communities from the new team in office, the relationship started to improve.<sup>13</sup> Indeed, the government commitment was translated into an increase in projects to support local capacities in DRR.<sup>14</sup> A concrete example has been the creation of community-based Shelter Management and Maintenance Committees (CSMMCs) to manage the multi-purposes cyclone shelters. The people in these committees volunteered to take care of the shelters and to lead the pre-disaster evacuation.<sup>15</sup> In addition, these shelters are used as community centres, Anganwadi centre<sup>16</sup>, training centre, wedding venue (mandap) and for any other social functions as long as it does not affect the prime purpose of the venue.<sup>17</sup> The fee to hire the venue for a social event is handled by volunteers in the CSMMCs who use it for maintenance, repair and disaster preparedness activities.<sup>18</sup> As a result, these shelters have not only increased the structural protection against disaster, but also the social glue that links people at the village level as well as their awareness of disaster reduction.<sup>19</sup>

In fact, the 1999 trauma helped the new government of Odisha to tap into self-organized groups and networks to ensure that disaster reduction measures were locally owned.<sup>20</sup> For example, the government started to pay more attention to the feedback from the Panchayati Raj – one of the oldest local government in the Indian subcontinent that includes respected members of the community elected during local elections.<sup>21</sup> This institution has highlighted vulnerabilities at the very local level and they are instrumental in mobilizing self-help group made of marginalized people, such as indigenous women, making them active partners for DRR activities.<sup>22</sup> To remind communities of the importance of DRR for their lives, the 1999 cyclone is celebrated every year to remember the victims and the importance of being prepared. During this day, a local official said “We recognize that each disaster is an opportunity to improve our risk reduction measures. Constant learning and remembering of past disasters are crucial to make Odisha resilient to future natural disasters and climate change”.

While there is a better collaboration with the local communities in terms of risk reduction, participants of focused group discussions have mentioned that the recovery, particularly the distribution of goods and construction material, created some tensions in the community.<sup>23</sup> According to interviewees, some local officials favoured their friends and families in the distribution of building materials.<sup>24</sup> Some community groups have raised the issue to the state government with the help of local NGOs, and the government has agreed to improve their disaster recovery efforts.<sup>25</sup> The World Banks also provided its technical assistance to help Odisha in its recovery activities.<sup>26</sup>

### 5.3. Committed political leadership

The Indian National Congress was in power in the state government of Odisha during the 1999 cyclone and was heavily criticized for its lack of preparedness and weak leadership to coordinate the international assistance. For example, food, medicines and shelter materials were not stockpiled in vulnerable areas and took much time before reaching the disaster victims.<sup>27</sup> The slow response was further exacerbated by political tensions with Delhi. Before the cyclone struck, several journalists denounced the administration in Odisha to be of poor quality and for doing little to reduce extreme hunger in the state (BBC, 1999). The total failure in responding to the 1999 cyclone made the population to vote massively for the opposition party, the Biju Janata Dal (BJD) of Naveen Patnaik during the state election in 2000. Naveen Patnaik became the new Chief Minister of Odisha and put forward an ambitious programme consisting of socio-economic reforms to increase the welfare of the population in Odisha.<sup>28</sup> DRR was seen as a central part of this endeavour. Much of the popularity of the Chief Minister Naveen Patnaik is credited to its image as an incorruptible and clean candidate committed to socioeconomically develop the state of Odisha.<sup>29</sup> Its image of a committed leader is also related to the commitment and popularity of his father Biju Patnaik, considered the 'Sher-e-Utkal' (Lion of Odisha) for its strong advocacy for national independence, federalism and social democracy. One of his famous quotes still resonates in today's Odisha administration.

In my dream of the 21st century for the State, I would have young men and women who put the interest of the State before them. They will have pride in themselves, confidence in themselves. They will not be at anybody's mercy, except their own selves. By their brains, intelligence and capacity, they will recapture the history of Kalinga.<sup>30</sup>

Since 2000, Odisha has seen an unprecedented economic growth of 8% on average, higher than the national growth. While Odisha remains a poor state in India, it has reduced the gap with the other states, achieving a 20 percentage point reduction in poverty (World Bank, 2016). Growth was driven by a range of administrative, fiscal and industrial policy reforms. Financial management reforms and expenditure control mechanisms helped Odisha achieve a remarkable progress in fiscal correction. Increased taxes due to higher prices on agricultural products and mining have permitted the state to invest in sustainable development with a strong focus on disaster risk management. The state government has taken several initiatives to improve its Human Development Index. For example, the Odisha government has constituted a poverty task force to encourage broad-based and pro-poor growth and has implemented programmes to empower women and encourage them to participate in the

economy.<sup>31</sup> Efforts to reduce infant mortality rate and DRR were also promoted.<sup>32</sup> These development efforts and increased presence of the state were well received by the local communities who highly rank the incumbent government. They have witnessed important differences in terms of services provided since 1999 and they have more space to raise development issues to local officials.<sup>33</sup>

Interviews with UNDP and World Bank staff argue that this economic growth and poverty reduction was credited to the new administration in Odisha that has committed to socioeconomically develop the state.<sup>34</sup> The Chief Minister has been particularly successful in hiring a team of efficient and committed technocrats that could conduct the needed reforms and programmes.<sup>35</sup> The commitment of the staff was to some extent provoked by the failure to respond to the 1999 cyclone and the urge to do better for the future generations.<sup>36</sup> The government of Odisha has been successful in coordinating with donors' agencies, UN organizations and NGOs to give them direction on the needs of the communities.<sup>37</sup> As a successful example of coordination, the government of Odisha has asked the World Bank to support the construction of cyclone shelters, the setting of early warning systems and to provide technical assistance in risk mitigation infrastructure and in methodologies for vulnerability assessment.<sup>38</sup>

The State of Odisha was congratulated on various occasions by Delhi and the international community for its development efforts. According to the United Nations special envoy for DRR who branded Odisha as a success story in DRR, the Odisha Government has "The right people, with right vision at the right place".<sup>39</sup> An important consequence of the Odisha government efforts to make economic development trickle down has been an improvement in infrastructures such as road and hospitals making pre-disaster evacuation easier and the relief more efficient.<sup>40</sup> In addition, economic development together with government efforts to improve building standards has improved the quality of many houses that are today more resistant to the cyclone.<sup>41</sup>

The strong political commitment to be more efficient in managing disaster was translated into the creation of various institutions in Odisha. In order to undertake a comprehensive and resilient recovery following the 1999 cyclone, the government of Odisha decided to have a separate institutional structure for addressing disaster and enact suitable rules and guidelines for institutionalizing DRR in the state.<sup>42</sup> The creation of the Odisha State Disaster Management Authority (OSDMA) was a major step to institutionalize DRR in Odisha. This new structure is functioning at the state, district and local level, and draws on the involvement of several other departments, administrative bodies, NGOs and international organizations (please see [Figure 2](#) for OSDMA network and [Figure 3](#) for the Institutional arrangement for disaster risk reduction in Odisha). While OSDMA is mainly involved in disaster

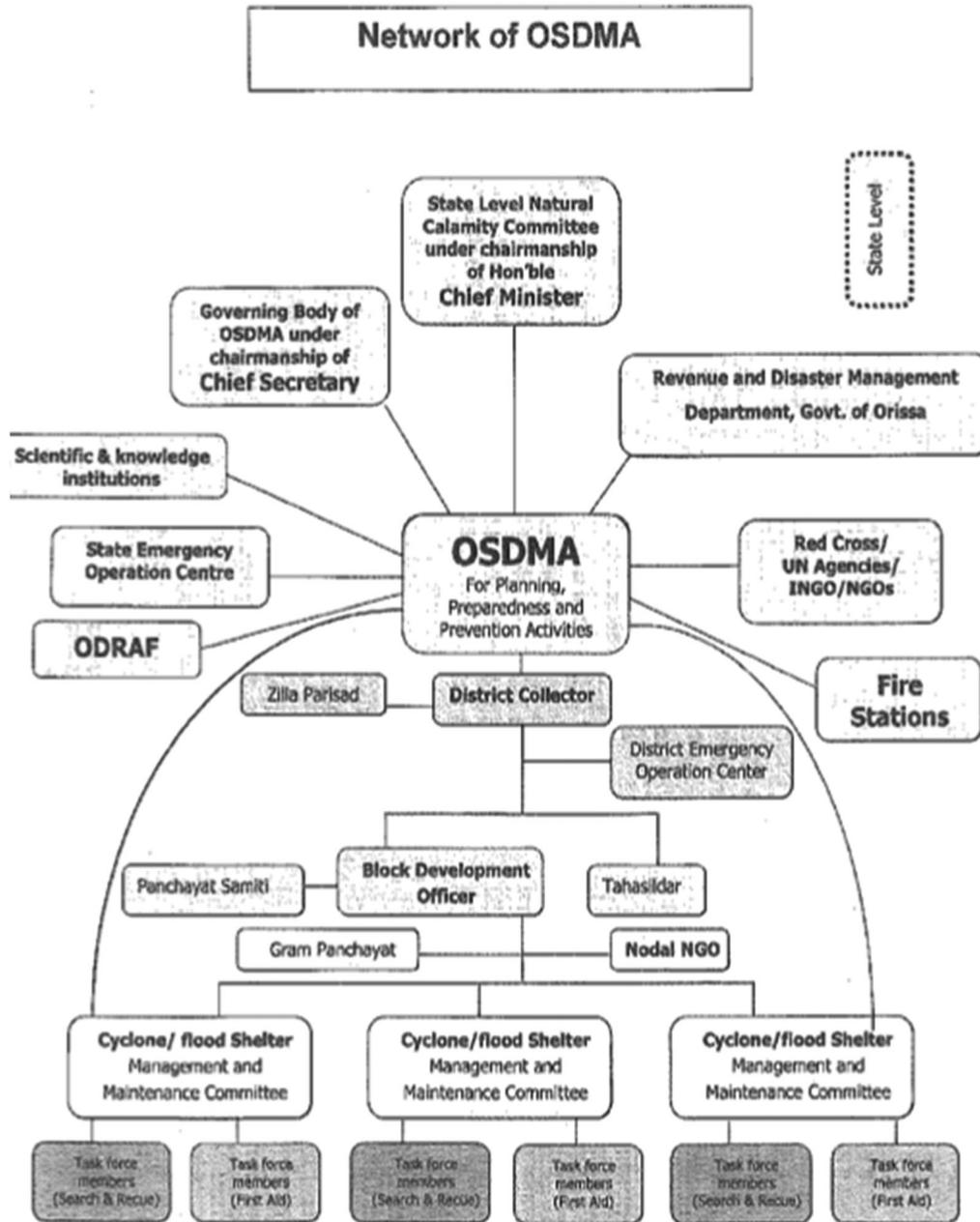


Figure 2. Architecture of Odisha State Disaster Management Authority (OSDMA). Source: Odisha State Disaster Management Authority (2014).

reduction it works directly with an older agency, the special relief commissioner, for disaster preparedness, response and recovery.<sup>43</sup> Both agencies fall under the authority of the Revenue and Disaster Management Department. At the district level, District Collectors are in charge of implementing measures regarding the five phases of DRR (Prevention, Mitigation, Preparedness, Response and Recovery). At the grassroots level, Village Disaster Management Committees raise awareness about disaster risk and report directly to Block Development Officers. According to the district collector of Ganjam, this institutional

setting at the district level provides space for mutual learning between communities and local officials. It has also improved trust in local officials from the populations.<sup>44</sup>

The shock from the 1990 cyclone and the political leadership to do better led to increased institutional collaboration at all levels of power.

Given that each disaster has different scales and intensity, the responsibility to reduce and respond to disasters is distributed among the disaster managers at the relevant levels. For example, if the disaster is small and local, only sub-district manager will be involved. However, if the disaster is

strong and large the entire state machinery will work in a coordinated way to be prepared and respond to the disaster. There is a lot of mutual learning between the different levels inside OSDMA and across other agencies.<sup>45</sup>

The Red Cross, NGOs and UN agencies have direct contact with the formal institutions inside the government of Odisha. The Red Cross for example works together with OSDMA in creating volunteer groups to take care of the cyclone shelters and train local communities in first aid skills and in mapping evacuations routes. A specific cell inside OSDMA provides a regular interface for the civil society to know what the government is doing and what its needs are. This cell promotes mutual learning and tries to provide the necessary flexibility and direction to combine efforts and address gaps. For example, the Red Cross has been at the forefront of DRR, and was the first organization that built cyclone shelters.<sup>46</sup> Its expertise has been essential to scaling up cyclone shelters in Odisha and OSDMA learned much from them.<sup>47</sup> Awareness and social mobilization has also improved as a result of

the Red Cross and OSDMA cooperation. As a concrete example, the United Nations Development Programme (UNDP) is supporting many of the Odisha government efforts in capacity building.<sup>48</sup> While NGOs tend to have an antagonistic relationship with the state in many countries, there is a good relationship in Odisha between these actors. “Through our work we have tried to create dialogue between the government and the communities to break the barrier of distrust”.<sup>49</sup> The fact that many NGOs have worked hand in hand with the government for the last decade has indirectly built the legitimacy of the state, and improved trust between local officials and the citizens.<sup>50</sup> In addition to creating trust between different organizations, it created communication channels and routines that could be efficiently used for disaster preparedness and evacuation.<sup>51</sup> This was made even more evident when Bhubaneswar, the capital of the Odisha, received an award from United Nations International Strategy for disaster Reduction (UNISDR) for making the city an example of resilience (Figures 2 and 4).<sup>52</sup>

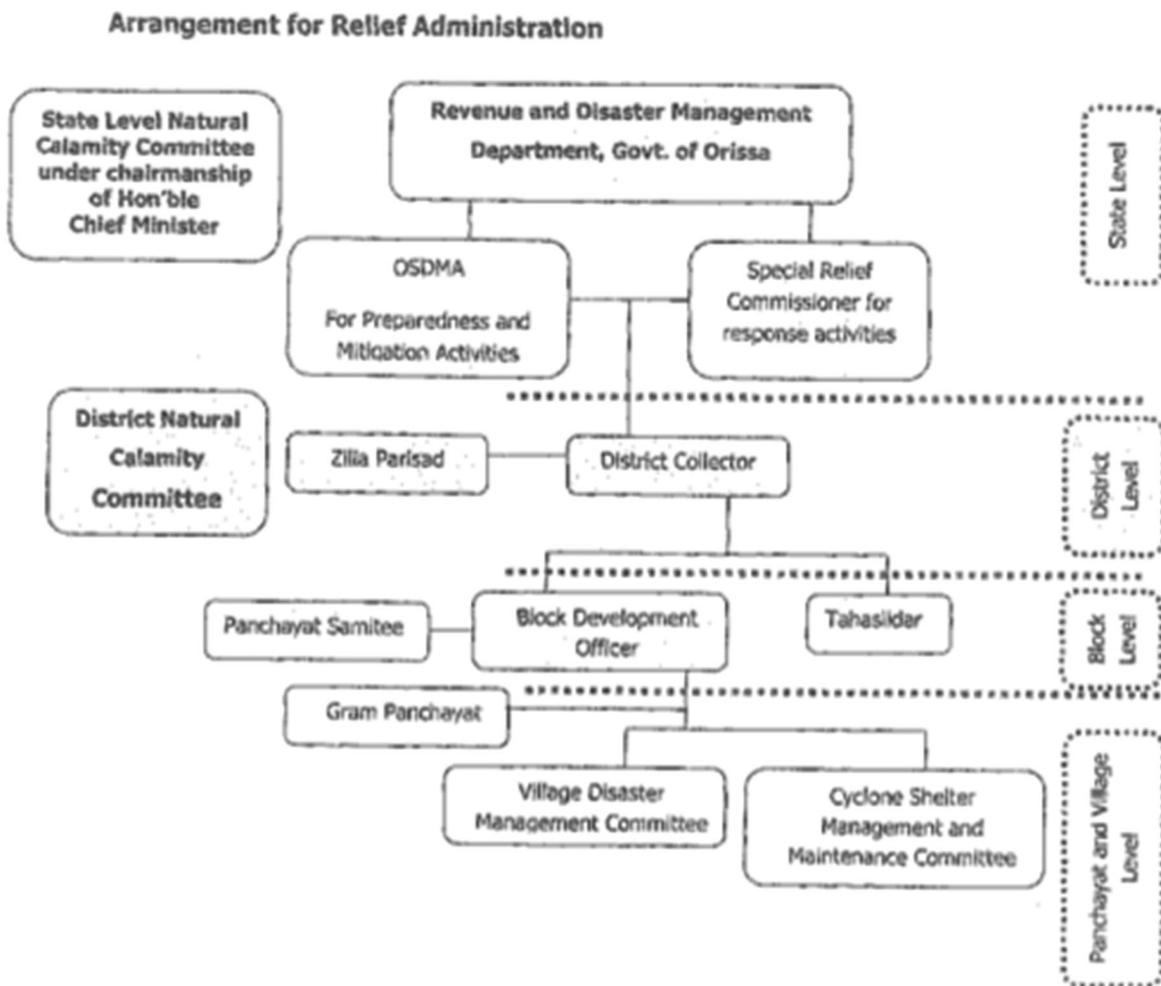


Figure 3. Institutional arrangement for DRR in Odisha. Source: Odisha State Disaster Management Authority (2014).

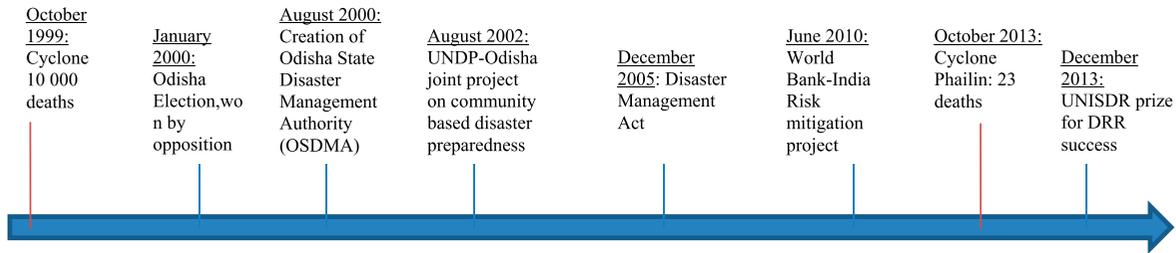


Figure 4. Timeline of key stage in adaptive governance.

## 6. Discussion and conclusion

This study has examined a case of adaptive governance in India. The main features of adaptive governance such as polycentric and multilayered institutions, collaboration and conflict resolution and self-organization and networks were documented in the paper. The paper demonstrated how a traumatic shock together with committed political leadership has led the government of Odisha to be more adaptive. The 1999 cyclone was a traumatic event for the population of Odisha, and this momentum was used by the new state administration to rethink governance in order to avoid the mistakes of the past. New institutions were created and more collaboration between the segments of the society was promoted. This shift to adaptive governance was adopted by the new political leadership in Odisha in order to make the state more resilient to natural disaster. The 2013 cyclone Phailin was a good test of this new adaptive governance system and proved itself efficient in reducing the loss from the natural hazards. It demonstrated how adaptive governance is essential for DRR. The empirical data – made of 47 interviews with disasters victims, state representatives, NGOs, international donors and UN agencies – show how several principles of adaptive governance saved lives during the 2013 cyclone. This study, therefore, provides a success example of adaptive governance in a poor region in India, indicating that socio-economic conditions are not in themselves obstacles towards the adoption of adaptive governance principles.

This is an important contribution to the previous literature in adaptive governance, as the concept has been criticized for being too conceptual and for neglecting the in-the-ground realities. Indeed, the existing literature remains scarce on examples of functioning adaptive governance systems, particularly in developing countries where states tend to have more limited resources and reach. In addition, it remains uncertain under what conditions governments shift to more adaptive systems of governance. This article has addressed these gaps by tracing how adaptive governance came about and was implemented in Odisha, one of the poorest states in India. It demonstrated how a dramatic natural disaster that killed more than 10,000 people transformed the type of governance in the state of Odisha, making the

region an example for resilience. This paper indicates that adaptive governance is an important part of DRR and resilience. Although governance for disaster risk is highlighted in the Sendai framework, the literature on adaptive governance and DRR have grown separately. This paper makes a case for cross-fertilization and collaboration between the two disciplines. Indeed, the conceptual work on adaptive governance will benefit from a more empirically grounded DRR and vice versa. For example, the focus on polycentric and multilayered institutions in the adaptive governance field could inspire the literature on DRR that is rather general regarding the most appropriate institutional settings for managing disasters. On the other hand, DRR can provide to the adaptive governance field more technical and empirically grounded ways to manage risk. In general, increased dialogue and coherence between DRR, adaptive governance and sustainable development are needed to avoid any duplication of efforts and to develop more encompassing and precise frameworks for building resilience. The interface between DRR and adaptive governance is a fruitful avenue for future research.

This study has found evidence that traumatic shock and committed political leadership are important factors in explaining the adoption of adaptive governance by the state of Odisha. To what extent are these factors applicable to other regions in the world? While this study only focused on the case of Odisha, the findings could potentially be applied to other regions in the developing world. The combination of traumatic shock and political commitment following a natural disaster can be found in the case of Indonesia, where the 2004 Indian Ocean tsunami triggered an ambitious plan for DRR. Particularly strong natural disasters often have a traumatic effect on the population; yet not all government take this momentum to change the way they govern. For example, typhoon Haiyan in the Philippines did not dramatically change the way governance is done in the regions of Leyte and Samar. Better understanding the conditions under which governments may use or not this momentum created by a natural is an important avenue for future research. The case of Odisha has shown that adaptive governance is context specific, and that the type of adaptive governance varies across cases and culture. In

order to provide guidance and follow-up action, adaptive governance needs to be grounded in its own context.

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### Notes

1. There are some differences between these terms but they share many similar characteristics, such as flexibility, institutional collaboration and learning. See previous research section for a more lengthy discussion on theories.
2. State Director, UNDP Odisha, November 2014, Bhubaneswar.
3. Humanitarian officer, UNOCHA, November 2014, Bhubaneswar.
4. Director (retired) of Odisha State Disaster Management (OSDMA), Odisha State Government, November 2014, Bhubaneswar.
5. Managing Director of Odisha State Disaster Management (OSDMA), Odisha State Government, November 2014, Bhubaneswar.
6. Director (retired) of Odisha State Disaster Management (OSDMA), Odisha State Government, November 2014, Bhubaneswar.
7. Director (retired) of Odisha State Disaster Management (OSDMA), Odisha State Government, November 2014, Bhubaneswar.
8. Managing Director of Odisha State Disaster Management (OSDMA), Odisha State Government, November 2014, Bhubaneswar.
9. Managing Director of Odisha State Disaster Management (OSDMA), Odisha State Government, November 2014, Bhubaneswar.
10. Emergency Responder at Odisha Disaster Rapid Action Force (ODRAF), Odisha State Government, October 2014, Bhubaneswar.
11. Zila Parishad of Ganjam district, Government of Odisha, November 2014, Berhampur.
12. Disaster evacuees and victims (13 persons), October 2014, Badaputi.
13. Disaster evacuees and victims (13 persons), October 2014, Badaputi.
14. Secretary, Panchayati Raj, Government of Odisha, November 2014, Bhubaneswar.
15. Coordinator, Shelter Management Committee, Aryapalli.
16. A typical Anganwadi centre provides basic health care in Indian villages. It was introduced by the Indian government in 1975 as part of the Integrated Child Development Services programme to combat child hunger and malnutrition.
17. Coordinator, Shelter Management Committee, Aryapalli.
18. Disaster evacuees and victims (3 persons), October 2014, Aryapalli.
19. Gram Panchayat of Basanaputi, Government of Odisha, November 2014, Basanaputi.
20. State Director, UNDP Odisha, November 2014, Bhubaneswar.
21. Secretary, Panchayati Raj, Government of Odisha, November 2014, Bhubaneswar.
22. Gram Panchayat of Basanaputi, Government of Odisha, November 2014, Basanaputi.
23. Disaster evacuees and victims (13 persons), October 2014, Badaputi.
24. Disaster evacuees and victims (7 persons), October 2014, Podampetta.
25. Disaster evacuees and victims (4 persons), October 2014, Basanaputi; Representative, Fishman folks organization, November 2014, Podampetta.
26. Social Development Specialist, the World Bank, November 2014, Bhubaneswar.
27. Director (retired) of Odisha State Disaster Management (OSDMA), Odisha State Government, November 2014, Bhubaneswar.
28. Managing Director, Oxfam India, November 2014, Bhubaneswar.
29. Deputy Relief Commissioner, Odisha State Government, October 2014, Bhubaneswar.
30. Director, Indian Society for Rural Development, November 2014 Gopalpur.
31. Social Development Specialist, the World Bank, November 2014, Bhubaneswar.
32. State Director, UNDP Odisha, November 2014, Bhubaneswar.
33. Disaster evacuees and victims (13 persons), October 2014, Badaputi.
34. Social Development Specialist, the World Bank, November 2014, Bhubaneswar.
35. District Collector of Ganjam, Odisha State Government, November 2014, Bhubaneswar.
36. Engineer-in-Chief, State Disaster Management (OSDMA), Odisha State Government, November 2014, Bhubaneswar.
37. Humanitarian officer, UNOCHA, November 2014, Bhubaneswar.
38. Consultant, the World Bank, November 2014, Bhubaneswar.
39. UN Special representative for Disaster Risk Reduction, September 2014, UNISDR, Geneva.
40. Consultant, the World Bank, November 2014, Bhubaneswar.
41. Block Development Officers of Podampetta, Government of Odisha, November 2014, Podampetta.
42. Managing Director of Odisha State Disaster Management (OSDMA), Odisha State Government, November 2014, Bhubaneswar.
43. Deputy Relief Commissioner, Odisha State Government, October 2014, Bhubaneswar.
44. District Collector of Ganjam, Odisha State Government, November 2014, Bhubaneswar.
45. Deputy Relief Commissioner, Odisha State Government, October 2014, Bhubaneswar.
46. Chief of the Red Cross Odisha, The International Federation of the Red Cross (IFRC), October 2014, Bhubaneswar.
47. State Director, UNDP Odisha, November 2014, Bhubaneswar.

48. State Director, UNDP Odisha, November 2014, Bhubaneswar.
49. Managing Director, Oxfam India, November 2014, Bhubaneswar.
50. Coordinator, Inter-Agency Group November 2014, Bhubaneswar.
51. Coordinator, Inter-Agency Group November 2014, Bhubaneswar.
52. UN Special representative for Disaster Risk Reduction, September 2014, UNISDR, Geneva.

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