

Institutional Pathways to Transformative Climate Change Adaptation in Ghana

Inaugural-Dissertation
zur Erlangung der Doktorwürde
der
Philosophischen Fakultät
der
Rheinischen Friedrich-Wilhelms-Universität
zu Bonn

vorgelegt von
Karsten Alexander Schulz
aus
Köln

Bonn, 2017

Gedruckt mit Genehmigung der Philosophischen Fakultät
der Rheinischen Friedrich-Wilhelms-Universität Bonn

Zusammensetzung der Prüfungskommission

Prof. Dr. Volker Kronenberg
(Vorsitzender)

Prof. Dr. Wolfram Hilz
(Betreuer und Gutachter)

Prof. Dr. Hartmut Ihne
(Gutachter)

Prof. Dr. Eva Youkhana
(weiteres prüfungsberechtigtes Mitglied)

Tag der mündlichen Prüfung: 04.05.2017

For my parents

*Icke jag
utan Gud i mig.*

Dag Hammarskjöld

In memory of Gideon Azaare Aniah
(† February 6, 2013)

ZUSAMMENFASSUNG

Ghana steht derzeit vor der Herausforderung, sich schnellstmöglich an Klimaveränderungen anzupassen und insbesondere in den Bereichen Landwirtschaft und Katastrophenschutz wirksame Maßnahmen gegen klimabezogene Risiken zu entwickeln. Gleichwohl ist bereits absehbar, dass traditionelle Anpassungstechniken und vorhandene finanzielle Mittel dazu nicht ausreichen werden. Auch lokale Institutionen stoßen angesichts dieser Aufgaben an die Grenzen ihrer Leistungsfähigkeit. Dennoch liegt für Ghana bislang keine umfassende Studie vor, welche diese transformativen Herausforderungen in systematischer Weise untersucht und sich in den Bereichen Katastrophenmanagement und Klimawandelanpassung mit dem Zusammenspiel von Akteuren, Diskursen und institutionellen Prozessen von der nationalen bis zur lokalen Ebene befasst. Vorliegende Anpassungsstudien beschäftigen sich in erster Linie mit spezifischen Politikfeldern (z. B. Landwirtschaft und Ressourcenmanagement) sowie mit sozialen Risiken im ländlich-kleinbäuerlichen Bereich. Die Entstehung neuer Risiken durch voranschreitende Urbanisierung sowie die empirische Untersuchung von urbanen und ländlichen Risiken in vergleichender Perspektive findet bisher nur wenig Beachtung.

Als gesellschaftliche Querschnittsaufgabe ist Anpassung jedoch nicht allein durch politikfeldspezifische und räumlich begrenzte Ansätze zu bewältigen. Dementsprechend besteht in auch in Ghana finanzpolitische Einsicht in die Notwendigkeit gesellschaftlicher und struktureller Transformationsprozesse, insbesondere vor dem Hintergrund schnell voranschreitender Urbanisierung, zunehmender Ressourcenknappheit und bereits auftretender sowie noch zu erwartender Klimaveränderungen. So veröffentlichte das Ghanaische Finanzministerium sein Budget für das Jahr 2015 unter dem Titel "Transformational Agenda: Securing the Bright Medium Term Prospects of the Economy.". Das Budget unterstreicht die besondere Notwendigkeit, geeignete institutionelle Strukturen zu etablieren, um *Green Economy* Ansätze sowie Klimawandel-Programme in die Praxis umzusetzen, die Umweltschutz, Jobwachstum und Armutsreduktion miteinander verbinden.

Organisationale Prozesse sollen einer Neubewertung unterzogen werden, um mittelfristig eine "klimasensitive" Finanzplanung sicherzustellen. Reformorientierte Dezentralisierungsprozesse in den Bereichen Katastrophenmanagement und Anpassungsplanung rücken daher zunehmend in den Fokus der staatlichen Entwicklungspolitik.

Wie genau solch "transformative" Anpassungsmaßnahmen in gesellschaftlichen und institutionellen Entwicklungsprozessen umgesetzt werden können, ist jedoch nach wie vor umstritten. Bisher liegen für Ghana so gut wie keine empirischen Studien vor, die sich mit der wesentlichen Rolle von Institutionen im Rahmen von "transformativ" ausgerichteten Anpassungskonzepten befassen und dabei die institutionellen Voraussetzungen für mögliche "Anpassungspfade" berücksichtigen. Generell beschäftigen sich Transformationsdiskurse in erster Linie mit struktur- und energiepolitischen Erwägungen der Industrieländer, beispielsweise im Kontext der deutschen "Energiewende", wobei eine klare Verengung der Debatte auf naturwissenschaftlich-technische sowie ökonomische Fragen zu beobachten ist.

In den Ländern Westafrikas, die bereits heute unter den negativen Folgen klimatischer Veränderungen leiden, finden gesellschaftliche Transformationsprozesse jedoch unter fundamental anderen Vorzeichen statt. Die Transformationsdebatte im Rahmen der internationalen Klimapolitik ist daher als Chance zu begreifen, um die konsequente Umsetzung bestehender entwicklungspolitischer Ziele und Vereinbarungen voranzubringen und Fortschritte im Hinblick auf eine nachhaltige sowie sozialverträgliche Anpassungspolitik zu erzielen.

Insgesamt werden dringend neue Perspektiven benötigt, die den Begriff der Transformation im Sinne einer globalen Veränderung von Wirtschaft und Gesellschaft in Richtung Nachhaltigkeit sowie als wissensbasierten und gesamtgesellschaftlichen Lern-, Such- und Handlungsprozess verstehen (siehe [TransZent](#); WBGU 2011). Um entsprechende empirische Forschungslücken zu schließen, verbindet die vorliegende Studie Konzepte der Anpassungsforschung mit neueren Theorien der Institutionenlehre, der Diskursanalyse und der risikobezogenen Szenarioplanung.

Auf diese Weise sollen *institutionelle*, d. h. normative, diskursive und organisationale Faktoren herausgearbeitet werden, die gesellschaftliche Anpassungspfade und Transformationskapazitäten in Ghana auf verschiedenen Ebenen beeinflussen.

Hierbei gilt es insbesondere die Frage zu beantworten, ob und inwiefern Risikodiskurse sich in politischen Mehrebenenprozessen verändern und welche Definitionen und Priorisierungen von klimabezogenen Risiken die praktische Umsetzung von Anpassungsstrategien bestimmen. Hervorzuheben sind insbesondere die politischen Ziele der kürzlich formulierten Klimawandel- und Anpassungspolitiken Ghanas. Hinzu kommt, dass die Aktivitäten von Akteuren der internationalen EZ im relativ neuen Politikfeld der "Klimawandelanpassung" (climate change adaptation) bisher nur wenig Beachtung finden. Allerdings üben internationale Geldgeber großen Einfluss auf die Entwicklung und Implementierung von Anpassungsstrategien in Ghana aus.

Forschungshintergrund

Die vorliegende Dissertationsschrift ist Teil der Forschungen im Rahmen des afrikanisch-deutschen Verbunds "WASCAL" (*West African Science Service Center on Climate Change and Adapted Land Use*; www.wascal.org). WASCAL wird gefördert durch das Bundesministerium für Bildung und Forschung (BMBF) und geht seit 2012 der Frage nach, wie negative Auswirkungen des Klimawandels auf die Landwirtschaft und die Ökosysteme in Westafrika abgemildert und soziale Risiken gemindert werden können. WASCAL besteht aus drei zentralen Komponenten: Einem Kompetenzzentrum für Klimafragen in Burkina Faso, einem zentralen Forschungsprogramm sowie einem Graduiertenprogramm. Insgesamt sind zehn westafrikanische Länder und zahlreiche deutsche und afrikanische Forschungsinstitute in WASCAL eingebunden.

Im Kontext des zentralen Forschungsprogramms untersucht die vorliegende Arbeit die institutionellen und politischen Dimensionen von Anpassung in Ghana.

Ziel der Arbeit

Das Ziel der Arbeit ist es, durch eine systematische Analyse des institutionellen Umfeldes in den Politikbereichen Klimawandelanpassung und Katastrophenmanagement bestehende Forschungslücken zu schließen und den Einfluss von institutionell-strukturellen Faktoren auf menschliche Vulnerabilität herauszuarbeiten. Im Mittelpunkt der Arbeit steht die Untersuchung komplexer Wechselwirkungen zwischen institutionellen Mehrebenenprozessen, Risiko- und Anpassungsdiskursen sowie lokaler Vulnerabilität. Die *praktische Relevanz* für politische Entscheidungsprozesse ist ein erklärtes Ziel der Arbeit, da basierend auf empirischer Forschung verschiedene institutionelle "Anpassungspfade" bzw. Szenarien herausgearbeitet werden, die als Orientierung für künftige politische Entscheidungsprozesse dienen können.

Forschungshypothese

Die Forschungshypothese der vorliegenden Arbeit besagt, dass sich soziale Vulnerabilität nicht allein auf Umweltveränderungen zurückführen lässt, sondern im Kern von politisch-institutionellen Prozessen abhängt. Basierend auf einem Ansatz der kritischen Sozialforschung wird daher davon ausgegangen, dass komplexe Institutionensysteme soziale Vulnerabilität strukturieren. Vulnerabilität gegenüber klimatischen Faktoren wird somit verstanden als ein Glied in einer spezifischen Kette von institutionell-strukturellen Interaktionsprozessen, die insgesamt dazu führen, dass sich Menschen in einer Risikosituation befinden, der sie aus eigener Kraft kaum entkommen können.

Aufbau und Methoden

Im Rahmen der Dissertation werden drei inhaltliche Schwerpunkte gesetzt:

- 1) Die Entwicklung von innovativen theoretischen Ansätzen und heuristischen Kategorien zur Analyse von normativen Anpassungsmodellen und institutionellen Anpassungspfaden;

- 2) die Untersuchung von Risikodiskursen auf nationaler, regionaler und Distriktebene, basierend auf einem Ansatz der *Wissenssoziologischen Diskursanalyse*;
- 3) die Durchführung einer *Vulnerabilitätsanalyse*, basierend auf quantitativen Haushaltsumfragen (n=484 HH) und Methoden der qualitativen Sozialforschung.

Die Ergebnisse der Diskursanalyse werden abschließend mit den Resultaten der Vulnerabilitätsanalyse verglichen, um Rückschlüsse bezüglich möglicher Diskrepanzen zwischen normativem Diskurs und Empirie sowie hinsichtlich spezifischer institutioneller Einflüsse auf Anpassungsprozesse zuzulassen. Dabei wird insbesondere untersucht, inwiefern sich Risikodiskurse verändern, wenn komplexe Konzepte wie Klimawandelanpassung mehrere administrative Ebenen durchlaufen und in lokalen soziokulturellen Kontexten Anwendung finden.

Feldforschung

Während eines Aufenthalts in der Landeshauptstadt Accra zu Beginn der Feldforschung wurden ausgewählte Regierungsangestellte und Spezialisten im Bereich Klimaanpassung befragt. Anschließend wurden in der Forschungsregion im Norden Ghanas Haushaltsumfragen in fünf ländlichen sowie zwei städtischen Gemeinden innerhalb des Veua Catchments durchgeführt. Das Veua Catchment ist ein großes Wassereinzugsgebiet in der Oberen Ostregion Ghanas, welches sich über zwei Verwaltungsdistrikte erstreckt, den Bongo District und den Bolgatanga Municipal District.

Im urbanen Raum wurden Haushalte in Bolgatanga befragt, die zum überwiegenden Teil keine Landwirtschaft betreiben und regelmäßig von schweren Überflutungen betroffen sind. Bei den ausgewählten Gemeinden im ländlichen Raum handelt es sich um Yikene Adohbisi, Veua-Gunga, Zaare Amoabisi und Namoo-Akunka. Die Mehrheit der Haushalte in den ländlichen Gemeinden ist eher kleinbäuerlich geprägt und betreibt regengespeiste Landwirtschaft. Dementsprechend sind viele Haushalte potentiell anfällig für klimabedingte Risiken, da insbesondere während der Trockenzeit nur wenige (oder gar keine) alternativen Bewässerungs- und Arbeitsmöglichkeiten zur Verfügung stehen. Als weitere Vergleichsgruppe

im ländlichen Raum wurden zudem Haushalte in Vea befragt, die innerhalb eines staatlichen Bewässerungsprojekts auch während der Trockenzeit kommerzielle Landwirtschaft betreiben.

Forschungsfragen

Die Arbeit widmet sich im Kern vier Fragestellungen, um die zentrale Forschungshypothese ("Institutionen sind der ausschlaggebende Faktor für soziale Vulnerabilität innerhalb der Forschungsregion") anhand empirischer Forschung zu überprüfen:

1. Wie lässt sich die institutionelle, d. h. die normative, diskursive und organisationale Dimension von Klimawandelanpassung in Ghana ontologisch, epistemologisch und empirisch am besten erfassen? Welche ethischen Implikationen gibt es?
2. Welche normativen Rahmungen von klimabezogenen Risiken bestimmen die politischen Handlungsstrategien der Ghanaischen Regierung? Verändern sich Definitionen und Priorisierungen in politischen Mehrebenenprozessen?
3. Welche institutionellen Faktoren beeinflussen die Adaptivität, die Anpassungsoptionen und die soziale Vulnerabilität von kommerziellen Farmern sowie städtischen und ländlichen Haushalten? Gibt es bedeutende Unterschiede innerhalb der Forschungsregion?
4. Wie unterscheiden sich Risiko- und Anpassungsdiskurse von der empirischen Realität in der Forschungsregion? Welche Schlussfolgerungen und Empfehlungen für zukünftige Anpassungspolitiken und transformative Anpassungspfade lassen sich aus diesen Erkenntnissen ableiten?

Wichtigste Ergebnisse der Untersuchung

Die durchgeführten Untersuchungen in Ghana zeigen deutlich, dass institutionelle Prozesse nicht nur ausschlaggebend für die Definition und Priorisierung von Risiken und damit für die strategische Verteilung von materiellen und symbolischen Ressourcen sind, sondern auch in entscheidendem Maße die Vulnerabilität der Bevölkerung gegenüber negativen

klimatischen Einflüssen strukturieren. Wenngleich eingeräumt werden muss, dass Umweltfaktoren wie unfruchtbare Böden oder natürliche Klimavariationen als kontrafaktische Argumente gegenüber einer rein strukturell determinierten Sicht auf soziale Risiken geltend gemacht werden könnten, so ist dennoch zu betonen, dass selbst bei diesen "natürlichen" Risiken menschliche Handlungen wie Übernutzung oder die armutsbedingte Abhängigkeit von regengespeister Landwirtschaft das Ausmaß der Vulnerabilität bestimmen.

Ferner lässt die Fallstudie zu Beginn der Untersuchung deutlich erkennen, dass die konflikträchtige Politisierung von Anpassungsmaßnahmen oft unterschätzt wird (für ein ähnliches Beispiel aus Malawi siehe: Harrison and Chiroro 2016). Vermeintlich inklusiv und "partizipatorisch" durchgeführte Planungsprozesse haben im Fall der geplanten Instandsetzung des Vea Bewässerungsprojekts nicht zu einer nachhaltigen und friedlichen Lösung von sozialen Konflikten beitragen können. Dies liegt maßgeblich an unterschwelligen und historisch bedingten Streitigkeiten um Macht und Einfluss zwischen traditionellen Institutionen, in die auch Vertreter der staatlichen Verwaltung und lokale Gemeinschaften involviert sind. Zusätzlich verstärkt werden bestehende Konflikte durch einen aggressiven Umgang mit abweichenden Interessen und die selektive Einbindung lokaler Machteilten sowie einflussreicher politischer Netzwerke.

Die Grundannahme, dass Gemeinden oder "communities" weitgehend homogene Entitäten mit neutralen und lösungsorientiert im Gemeinsinn wirkenden Institutionen sind, ist daher im besten Fall als politisch naive Haltung und im schlimmsten Fall als gravierendes Risiko für die sozialverträgliche Umsetzung von dringend erforderlichen Anpassungsmaßnahmen bzw. Infrastrukturprojekten zu bezeichnen. Weiterhin ist festzuhalten, dass rationale Planungsprozesse gleichermaßen in komplexe kulturelle, materielle und institutionelle Strukturen eingebunden sind und daher keinesfalls als uneingeschränkt objektiv oder frei von normativen Interessen betrachtet werden sollten.

Die inkrementelle Reformfähigkeit komplexer politischer Systeme, die oftmals durch eine routinebasierte, managementorientierte und von po-

litischen Partikularinteressen geleitete Handlungslogik dominiert werden, muss daher zumindest angezweifelt werden.

Diese institutionelle Frage der Reformfähigkeit weist auf die Notwendigkeit transformativer Anpassungspfade hin, deren gesellschaftliche Innovationskraft sich aus dem potentiell produktiven und kreativen Antagonismus des Politischen speist. Dennoch ist auch für transformative gesellschaftliche Anpassungsprozesse ein förderliches institutionelles, sozio-ökonomisches und kulturelles Umfeld vonnöten, zumindest wenn davon ausgegangen wird, dass gesellschaftliche Transformation nicht als ein weitgehend unkontrollierter Umbruch zwischen verschiedenen systemischen Grundzuständen erfolgt, etwa aufgrund sozialer und ökologischer Krisenauswirkungen.

Die Ergebnisse der Diskurs- und der Dispositif-Analyse lassen dennoch den Rückschluss zu, dass selbst konservative Interpretationen transformativer Anpassungspfade – etwa im Sinne einer Neuordnung des landwirtschaftlichen Systems – bislang keine nennenswerten Auswirkungen auf die praktische Ausgestaltung der Ghanaischen Anpassungspolitik haben. Derzeit ist die offizielle normative Rahmung von Anpassungsstrategien durch die Ghanaische Regierung im weitesten Sinne als eine Mischung aus politisch-organisationalen und wirtschaftlichen Reformbestrebungen sowie Infrastrukturprojekten zu bezeichnen.

Aufgrund der politischen Eigendynamik von Mehrebenenprozessen und "Mainstreaming"-Bemühungen von internationalen Organisationen ist auf regionaler und Distrikt-Ebene zudem eine Verschiebung offizieller Definitionen und Priorisierungen von Anpassung zu beobachten. Diese Prioritätenverschiebung ist insofern relevant, als dass Anpassung zusehends auf "klimabedingte" und "natürliche" Risiken bezogen und im Sinne eines politisch konservativen Resilienzdenkens verstanden wird, welches progressive strukturelle Veränderungen und die politische Natur sozialer Vulnerabilität weitgehend ausblendet. Diese Erkenntnisse unterstreichen erneut die Bedeutung der Veia Fallstudie, die das konkrete Risiko einer solchen diskursiven und planerischen Engführung deutlich macht.

Im direkten Vergleich weisen die empirischen Ergebnisse der Risikoanalyse darauf hin, dass sich Risiko- und Anpassungsdiskurse teils deutlich

von der empirischen Realität in der Forschungsregion unterscheiden. Trotz der Betonung reformorientierter Klima- und Anpassungspolitik in zentralen strategischen Dokumenten der Ghanaischen Regierung bestehen nach wie vor große Probleme im Bereich der Implementierung, die insgesamt durch institutionelle bzw. strukturelle Hindernisse bedingt sind. Gleichermaßen beeinflussen diese institutionell-strukturellen Faktoren die Adaptivität, Anpassungsoptionen und die soziale Vulnerabilität von städtischen und ländlichen Haushalten. In diesem Zusammenhang von Anpassungs"fähigkeit" (oder *adaptive capacity*) zu sprechen erscheint unangemessen, da Menschen oftmals über eine beeindruckende Vielfalt von Fähigkeiten verfügen und dennoch verwundbar sind, beispielsweise aufgrund von struktureller Marginalisierung oder von institutionellen Faktoren, die jenseits ihrer individuellen Einflussphären liegen. Transformative Anpassung betont daher die Notwendigkeit, institutionell und systemisch bedingte Hindernisse zu überwinden, wobei inkrementelle Reformbemühungen durch oftmals selbstreferentielle Managementstrukturen als weitgehend unzureichend angesehen werden.

Insgesamt ist gerade das Zusammenspiel von institutionellen Strukturen und organisationalen Prozessen ausschlaggebend für die Umstände unter denen Risiken für die Bevölkerung entstehen. Bedingt durch "relationale" Prozesse der institutionellen Territorialisierung einerseits, sowie durch "sitierte" Risiken andererseits (z. B. die Lage eines Hauses in einem Überflutungsgebiet) wird soziale Adaptivität strukturiert. Oftmals bleibt jedoch weitgehend unhinterfragt, warum bestimmte Bevölkerungsgruppen stärker von situierten "natürlichen" Risiken betroffen sind als andere. Mit anderen Worten, natürliche Risiken wie Dürren und Überflutungen sind niemals *rein* natürlich in Bezug auf ihre Auswirkungen, insbesondere vor dem Hintergrund des anthropogenen Klimawandels und erhöhter Klimavariabilität.

Im Kontext der Risikoanalyse wurde daher eine Reihe von entscheidenden institutionellen Risikofaktoren ermittelt, deren komplexes Zusammenspiel als zentral für die soziale Vulnerabilität der Bevölkerung in der Oberen Ostregion Ghanas gelten kann. Diese Risikofaktoren sind: (a) der nicht abgeschlossene fiskalische und politische Dezentralisierungsprozess

in Ghana; (b) die schlechte finanzielle, personelle und technische Ausstattung der staatlichen Organe, die mit der Implementierung von anpassungsrelevanten Maßnahmen beauftragt sind; (c) das Fehlen relevanter Expertise auf subregionaler Ebene; (d) die fehlende Abstimmung zwischen Regierungsorganisationen und internationalen Partnern sowie zwischen Regierungsorganisationen in verschiedenen Politikfeldern untereinander; (e) teils unklare oder sich überschneidende politische Mandate; (f) Korruption und Klientelpolitik; (g) sowie entwicklungsbezogene Herausforderungen im weitesten Sinne.

Der letzte Punkt beschreibt vor allem strukturelle Probleme wie defizitäre Infrastruktur, hohe Jugendarbeitslosigkeit, Armut und mangelnde ökonomische Perspektiven durch schlechte Bildung und Ausbildungsstandards, unkontrollierte Urbanisierung und damit einhergehende Landnutzungskonflikte, sowie die zunehmende Desintegration sozialer Netzwerke jenseits der Kernfamilie. In Verbindung mit zunehmenden Belastungen der natürlichen Lebensgrundlagen durch (oft armutsbedingte) Ressourcenübernutzung sowie eine rasch wachsende Bevölkerung führen diese Faktoren zu einer geringen Adaptivität von Individuen und gesellschaftlichen Strukturen.

Im Hinblick auf bestehende Unterschiede in der Adaptivität ländlicher und städtischer Haushalte zeigt die Haushaltsumfrage (n=484 Haushalte) in der Oberen Ostregion, dass 92.6 Prozent aller befragten Haushalte in ländlichen Gebieten von saisonaler Ernährungsunsicherheit betroffen sind. Vor allem der Zeitraum von März bis Mai muss als besonders herausfordernd betrachtet werden. Darüber hinaus wird deutlich, dass direkter Zugang zu Bewässerungsanlagen oder Kreditprogrammen die Ernährungssicherheit von ländlichen Haushalten in der Forschungsregion nicht signifikant verbessert hat. Die saisonale Ernährungssicherheit ländlicher Haushalte, die kommerziell ausgerichtete Landwirtschaft betreiben und besseren Zugang zu Krediten und einem staatlichen Bewässerungsprojekt haben, ist gleichermaßen hoch. Auch hier liegt der Wert bei 90 Prozent.

Es ist daher festzuhalten, dass der *Zugang* zu Ressourcen, Infrastruktur und staatlichen Dienstleistungen allein nicht ausreichend ist, um die Ernährungssicherheit von ländlichen Haushalten in der Forschungsregion

zu gewährleisten, solange Fragen der *Qualität* und *Nutzung* bzw. der langfristigen Nutzbarkeit nur eine vergleichsweise geringe Rolle spielen.

Selbst wenn Zugang zu Kreditdienstleistungen formeller oder informeller Art besteht und auf landwirtschaftliche Produktionsmittel wie anorganischen Dünger oder Pestizide zurückgegriffen werden kann, so ist deren Einsatz häufig unwirksam. Dies hängt teilweise mit Faktoren wie einem generellen Arbeitskräftemangel für die Bodenvorbereitung und dem schlechten Zustand der Bewässerungsinfrastruktur zusammen, ergibt sich allerdings auch aus der riskanten Natur der Landwirtschaft im Allgemeinen. Wenn Haushalte etwa durch zusätzliche Risiken wie Stürme, Starkregen, Überschwemmungen oder Dürren betroffen sind, so ist die staatliche Katastrophenschutzorganisation (NADMO) nicht in der Lage, Haushalte hinsichtlich der mittel- und langfristigen Auswirkungen von Ernteausfällen bzw. Sach- oder Personenschäden zu unterstützen. Da Ernten und Hausrat in der Regel nicht versichert sind, können landwirtschaftliche Haushalte durch wiederholt auftretende Elementarschäden leicht in eine Armutsfalle geraten, zumal gegebenenfalls erhaltene landwirtschaftliche Kredite unter den entsprechenden Umständen oft anderweitig verwendet werden (müssen).

Im direkten Vergleich mit ländlichen Gebieten ist die Situation städtischer Haushalte als moderat besser anzusehen, wobei jedoch immer noch 64 Prozent aller befragten Haushalte von saisonaler Ernährungsunsicherheit betroffen sind. Ein anzunehmender Grund für diese moderat bessere Lage ist, dass die städtische Bevölkerung im Forschungsgebiet in geringerem Maße auf risikoreiche Landwirtschaft als *primäre* Wirtschaftsaktivität angewiesen ist, mit mäßig positiven Effekten für die Ernährungssicherheit der Haushalte. Dennoch sind die Ergebnisse zumindest teilweise überraschend, da eine Analyse der institutionellen Rahmenbedingungen ebenfalls ergeben hat, dass insbesondere Haushalte in von rascher Urbanisierung betroffenen peri-urbanen Gebieten sozial weniger gut vernetzt sind als ihre ländlichen Pendanten.

Im Hinblick auf die teilweise widersprüchlichen sozialen Auswirkungen von Urbanisierungsprozessen im Kontext des sich rasch verändernden

Land-Stadt Kontinuums in Ghana sind daher dringend vertiefende Studien vonnöten. Basierend auf den Ergebnissen der Untersuchung muss zunächst davon ausgegangen werden, dass das urbane Umfeld in Bolgatanga grundsätzlich strukturelle Vorteile bietet, die sich positiv auf die Ernährungssicherheit der befragten Haushalte auswirken. Diejenigen Faktoren, die am ehesten eine positive Auswirkung auf Ernährungssicherheit haben sind Bildung, wirtschaftlich vermarktbar Fähigkeiten und die Haushaltszusammensetzung, während frühere Studien nahelegen, dass Faktoren wie Geldsendungen aus dem In- und Ausland (*remittances*) und der Zugang zu Krediten in städtischen Gebieten weniger relevant sind (siehe z. B. Maxwell *u.a.* 2000, Frimpong und Asuming-Brempong 2013). Insgesamt gibt es daher Grund zur Annahme, dass eine bessere Ausbildung zu der höheren Wahrscheinlichkeit führt, eine auskömmliche Erwerbstätigkeit zu finden. Dies ermöglicht potentiell höhere Pro-Kopf-Ausgaben für Lebensmittel und kann höhere Lebenshaltungskosten in einem städtischen Umfeld kompensieren. Im Umkehrschluss ist jedoch ebenfalls klar, dass ein regionales politisches und Handelszentrum wie Bolgatanga aufgrund seiner mäßig diversifizierten Wirtschaftsstruktur und damit verbundener Beschäftigungsmöglichkeiten mehr Menschen mit höherem Bildungsniveau anzieht. Die Umfrageergebnisse belegen dies gleichermaßen.

Es lohnt sich daher in weiteren Untersuchungen der Frage nachzugehen, unter welchen Voraussetzungen Urbanisierung die Ernährungssicherheit verbessert und die Chancen auf eine auskömmliche nicht-landwirtschaftliche Beschäftigung für benachteiligte Gruppen bzw. gering qualifizierte Personen erhöht. Bisherige Erkenntnisse der Studie lassen die Vermutung zu, dass unkontrollierte Urbanisierung in Ghanas Norden bestehende Ungleichheiten und Landnutzungskonflikte eher verstärkt, da sich zwar neue Chancen für ohnehin gut ausgebildete Bevölkerungsschichten ergeben, sozial benachteiligte Gruppen aber kaum profitieren.

Auf Grundlage dieser Erkenntnisse gilt es abschließend zu bewerten, welche Anpassungsoptionen, Handlungsoptionen und Forschungsempfehlungen sich aus der Risikoanalyse ableiten lassen, die mithilfe des neu entwickelten Ansatzes der "Institutionellen Anpassungspfade" durchgeführt

wurde. In diesem Zusammenhang wurden insgesamt vier plausible Szenarien für mögliche Anpassungspfade berücksichtigt. Diese Szenarien sind: (1) "Ausgleich" (*adjustment*); (2) "Reform" (*reform*); (3) "Transformation" (*transformation*); sowie als konterfaktisches Szenario (4) "Business-as-Usual".

Wie bereits erwähnt lassen die Ergebnisse der Diskursanalyse den Schluss zu, dass die offizielle normative Rahmung von Anpassungsstrategien durch die Ghanaische Regierung derzeit als eine Mischung aus politisch-organisationalen und wirtschaftlichen Reformbestrebungen sowie Infrastrukturprojekten angesehen werden kann. Das erste Szenario der "Angleichung" basiert daher auf der Annahme, dass konservatives Resilienzdenken und das Paradigma "klimafester" (*climate-proof*) ökonomischer Entwicklung mittel- und langfristig die Ghanaische Anpassungspolitik bestimmen. Der konservative Ansatz der Angleichung wird derzeit von der Regierung und einflussreichen Ghanaischen Entscheidungsträgern vertreten. Dementsprechend geht das erste Szenario davon aus, dass zukünftig finanzielle Mittel, Ressourcen und Risiken aufgrund von Entscheidungen verteilt werden, die das klare Ziel verfolgen "klimafeste" Wertschöpfungsketten, Infrastruktur, sowie Energie- und Landnutzungssysteme aufzubauen. Weiterhin wird bei einem solchen Szenario besonderes Augenmerk auf den Katastrophenschutz gelegt, beispielsweise durch die Einrichtung von verbesserten Frühwarnsystemen. Insgesamt ist das Risiko der Fehlanpassung bei einem solchen Szenario dennoch als hoch einzustufen.

Diese Einschätzung ist vor allem dadurch zu begründen, dass asymmetrische Machtverhältnisse sowie soziokulturelle und institutionelle Bedingungen von Vulnerabilität und Marginalisierung weitgehend außer Acht gelassen werden, während für eine Implementierung der angestrebten Maßnahmen notwendige weitreichende organisationale und strukturelle Reformen zugunsten technischer, fragmentierter und sektorspezifischer Planungsansätze vernachlässigt werden.

Im direkten Vergleich geht das Szenario "Reform" davon aus, dass strukturelle und politische Reformanstrengungen zugunsten benachteiligter Bevölkerungsgruppen das erste Szenario der "Angleichung" ergänzen.

Eine Grundvoraussetzung für das Reformszenario ist, dass insgesamt der politische Wille zur Umsetzung progressiver Elemente aus der klimapolitischen Strategie Ghanas (National Climate Change Policy 2013) sowie aus entwicklungspolitisch relevanten Richtlinienpapieren besteht (siehe z. B. NCCAS 2010, SADA 2010, GSGDA II 2014, DESA 2015).

Im Hinblick auf die Ermöglichung eines solchen reformorientierten Anpassungspfades ist es jedoch entscheidend, zunächst die organisationalen und politischen Voraussetzungen für eine wirksame Umsetzung von Anpassungsmaßnahmen in der Region zu schaffen. Dies beinhaltet (a) die Verbesserung von armutsorientierten Dienstleistungen und Strukturen im Bereich Katastrophenrisikominderung (insbesondere für die langfristige Unterstützung betroffener Haushalte nach dem Katastrophenfall), (b) die Schaffung von politischen und strukturellen Rahmenbedingungen zur Bereitstellung von adäquater Infrastruktur, (c) sowie die Etablierung von langfristigen Qualitätskontrollen und Instandsetzungsvereinbarungen, um die wirksame Koordinierung und Ermöglichung flexibler Anpassungspfade zu gewährleisten.

Dabei muss vor dem Hintergrund der Erfahrungen der Fallstudie davon ausgegangen werden, dass zur Ermöglichung solcher Anpassungspfade nicht nur organisationale und finanzielle Schwierigkeiten überwunden werden müssen, sondern auch politische und institutionelle. Vor allem sollte die frühzeitige und langfristige Einbindung der lokalen Bevölkerung sowie lokaler sozialwissenschaftlicher Forschungseinrichtungen in Planungsprozesse beachtet werden, um einen sozialverträglichen Interessenausgleich zu gewährleisten. Marginalisierte Gruppen sollten im Fokus der Aufmerksamkeit stehen, um Partizipation nicht auf lokale Eliten und traditionelle Autoritäten zu beschränken, die oftmals ihre eigene politische Agenda verfolgen und nicht notwendigerweise im Gemeinsinn handeln. Ferner ist zu beachten, dass ein ressourcenorientierter Planungsansatz die Nachhaltigkeit, Robustheit und Flexibilität von Anpassungspfaden erhöhen kann, da auf diese Weise eine planerische Engführung auf bestimmte Politiksektoren oder lokale Gemeinschaften vermieden wird, deren spezifische Interessen den Nutzungsinteressen anderer Gruppen bzw. Sektoren potentiell zuwiderlaufen.

Zusätzlich ist festzustellen, dass Anpassungsprojekte häufig organisatorische Parallelstrukturen schaffen, die von der Bevölkerung in bestehende soziale Netzwerke und hierarchische Machstrukturen integriert werden. Auch diese Integrationsprozesse erfolgen jedoch nicht notwendigerweise im Sinne einer sozial ausgewogenen Anpassungspolitik, da einflussreiche Netzwerke und Interessengruppen oft privilegierten Zugang zu bereitgestellten Ressourcen haben. Nach dem Auslaufen der entsprechenden Projekte wird nur sehr selten die Nachhaltigkeit und langfristige Wirkung der Projektinterventionen in den Blick genommen, bzw. tatsächlich überprüft welche strukturellen Integrationsprozesse langfristig zu beobachten sind. Im Hinblick auf die Situation in der Oberen Ostregion ist es daher insgesamt fraglich, ob ein "partizipativer" Planungsansatz sowie eine starke Fokussierung politischer Maßnahmen auf priorisierte Risikofaktoren wie Trockenheit oder Dürre langfristig zu einer besseren Integration von Katastrophenrisikominderungs- und Anpassungsmaßnahmen sowie zu einer positiven Veränderung der Lebenssituation der Menschen führt.

Zum einen stützt sich diese vergleichsweise pessimistische Einschätzung auf die Erfahrungen der Fallstudie. Obwohl die Fallstudie nicht repräsentativ für die Situation in der Region insgesamt ist, so zeigt sie dennoch typische Marginalisierungsprozesse und Dynamiken der Politisierung auf. Zum anderen verdeutlicht die Analyse des politischen Umfelds in Ghana, dass ein nicht abgeschlossener Dezentralisierungsprozess, klientelistische Netzwerkstrukturen, traditionelle Geschlechterrollen und Defizite im Hinblick auf organisationale Abläufe und Strukturen die Umsetzung von politischen Reformvorhaben und die effektive Beteiligung von benachteiligten Bevölkerungsgruppen erschweren.

Im Vergleich zu inkrementellen Reformpfaden geht das progressive Szenario der geplanten gesellschaftlichen "Transformation" daher von der Prämisse aus, dass inkrementelle Reformen und Interventionen innerhalb bestehender Strukturen und Paradigmen allein unzureichend sein werden, um systemisch bedingte Risiken zu überwinden. Die diskursive Rahmung des Transformationsbegriffs ist jedoch politisch umstritten. Während ein progressiver Transformationspfad die grundlegende Veränderung des unnachhaltigen ökonomischen Systems sowie gesellschaftlicher

Macht- und Naturverhältnisse im Sinne eines sozial gerechten Gesellschaftsvertrags anstrebt, ist die konservative Auslegung des Transformationsbegriffs gegenwärtig auf die Anpassung des landwirtschaftlichen Sektors an klimatische Veränderungen beschränkt, etwa durch die geographische Verschiebung von Anbaugebieten.

Grundsätzlich ist es jedoch sowohl im Kontext eines konservativen als auch eines progressiven Transformationspfades notwendig, eine ausgewogene Strategie für die Umgestaltung landwirtschaftlicher Systeme zum Zwecke der nachhaltigen Ernährungssicherung zu entwickeln. Hierbei ist zu berücksichtigen, dass die generelle Adaptivität und Produktivität kleinbäuerlicher landwirtschaftlicher Systeme nicht *nur* durch industrielle Landwirtschaft, Intensivierung, Exportorientierung und Expansion erhöht werden kann, sondern auch durch Methoden der nachhaltigen ökologischen Landwirtschaft (siehe z. B. EOA 2015).

Obwohl je nach ökologischer Situation und Bodenbeschaffenheit moderne landwirtschaftliche Methoden wie Mechanisierung nicht grundsätzlich abzulehnen sind, bestehen beachtliche Risiken beim Transfer eines industriellen "Green Revolution" Ansatzes in die Obere Ostregion und nach Ghana insgesamt. Die konkreten Gefahren sind eine erhöhte Abhängigkeit der Landwirte von der Preispolitik und den Produkten großer Agrarkonzerne, z. B. durch die Nutzung von hybridem Saatgut, das jede Saison neu erstanden werden muss, oder durch den teuren Erwerb von anorganischen Düngemitteln und Pestiziden. Gleichzeitig sind die negativen ökologischen und gesundheitlichen Folgen industrieller landwirtschaftlicher Methoden zu berücksichtigen, die etwa durch den Einsatz von chemischen Produkten entstehen. Expansion und Exportorientierung können zudem zu Landnutzungskonflikten und der Verdrängung von Kleinbauern führen, wobei letztlich nicht einmal die erhöhte Produktivität und ökonomische Rentabilität von hybriden Sorten in jedem Fall als ausschlaggebendes Argument gelten kann. So sind etwa im Vergleich zu hybriden Maissorten traditionelle Varianten wesentlich besser an die lokalen ökologischen Bedingungen der Oberen Ostregion angepasst, beispielsweise durch eine erhöhte Widerstandsfähigkeit gegen spät auftretende Dürren, was Ernteauffällen vorbeugen kann. Hinzu kommt, dass traditionelle Sor-

ten insgesamt günstiger im Anbau sind, da sie weniger chemische Düngemittel und Pestizide benötigen, wobei sich das Saatgut von selbst reproduziert.

Die gezielte Förderung ökologischen Landbaus in Verbindung mit sozialverträglichen Modernisierungsansätzen und Strategien zur verbesserten Einbindung von Kleinbauern in Wertschöpfungsketten kann daher als ein komplexer "transformativer" Pfad für die Umgestaltung landwirtschaftlicher Systeme bei gleichzeitiger Erhöhung der Adaptivität, Produktqualität und Ernährungssicherheit gelten. Nicht auszuschließen wäre zudem ein Rückgang der (Jugend-)Arbeitslosigkeit in ländlichen Gebieten, insbesondere während der Trockenzeit, und damit eine potentielle Verlangsamung rasch voranschreitender Urbanisierungsprozesse durch Land-Stadt Migration. Zusätzlich besteht ein großes Potential für die Intensivierung der städtischen Landwirtschaft durch eine verbesserte staatliche Unterstützung in den Bereichen Produktsicherheit und Landnutzungsplanung sowie durch gezielte landwirtschaftliche und technische Beratung. Dieses Potential kann erschlossen werden, um Einkommensquellen zu diversifizieren und die Adaptivität sowie die Ernährungssicherheit insbesondere der sozial benachteiligten städtischen Bevölkerung zu erhöhen, mit potenziell positiven Auswirkungen in den Bereichen Bildung, Gesundheit und soziale Sicherheit.

Dennoch muss festgehalten werden, dass der Transformationsbegriff bei einer derartigen Verengung und konservativen Auslegung kaum noch vom Begriff der Reform oder der "klimafesten" ökonomischen Entwicklung nach bestehendem Muster abgegrenzt werden kann, da inkrementelle technische und organisationale Veränderungen des landwirtschaftlichen Systems im Mittelpunkt stehen. Die gesellschaftlichen Machtverhältnisse auf denen das unnachhaltige ökonomische System insgesamt beruht werden nicht angezweifelt, obwohl globale "Megatrends" wie der anthropogene Klimawandel, Bevölkerungswachstum und Urbanisierung, Ressourcenknappheit und die immer weiter auseinanderklaffende Schere zwischen Arm und Reich systemverändernde Lösungen erfordern.

So würden sich beispielsweise selbst bei einer anzunehmenden Umstellung auf 100 Prozent erneuerbare Energien in allen Wirtschaftssektoren

bestehende Produktions- und Konsummuster nicht grundlegend verändern. Es besteht also das transformative Grundproblem der Entkopplung von wirtschaftlichem Wachstum und steigendem Ressourcenverbrauch.

Aufgrund zunehmender Schwierigkeiten im Zusammenhang mit der gesellschaftlichen Umsetzung progressiver Anpassungspolitiken geht das konterfaktische Szenario daher davon aus, dass sozial unausgewogene oder gescheiterte Reformen sowie ein konservatives Transformations- bzw. Resilienzdenken zur Ermöglichung von "Business-As-Usual" Entwicklungspfaden beitragen. Oftmals verschwimmen grundlegende Unterschiede zwischen institutionellen Angleichungs-, Reform- und Transformationspfaden zusehends, sobald es um eine praktische politische Umsetzung von Anpassungsmaßnahmen geht.

Demzufolge plädiert die Arbeit für einen prozessualen Anpassungsbegriff, der davon ausgeht, dass die konkreten politischen Ziele hinter einem Anpassungspfad – etwa Angleichung, Reform oder Transformation – für die langfristige Abstimmung und Umsetzung von einzelnen Anpassungsschritten ausschlaggebend sein sollten. Darüber hinaus wird die Transition entlang eines bestimmten institutionellen Anpassungspfades – der im Idealfall auf ein bestimmtes Ziel hin ausgerichtet ist – permanent durch kulturell-kognitive, soziale, politische, ökonomische, technologische und ökologisch-materielle Faktoren beeinflusst. Daher ist davon auszugehen, dass viele inkrementelle Reformen entlang eines Anpassungspfades insgesamt eine transformative Wirkung entfalten können, wobei dennoch immer auch mit einem gescheiterten oder regressiven Anpassungsprozess gerechnet werden muss. Dies ist genau der Punkt, bei dem das vierte Szenario ansetzt.

Die Arbeit bezieht sich in diesem Zusammenhang auf den Kernbegriff der "Politik des Indeterminismus" bzw. Politik der Unbestimmtheit. Mit diesem Begriff verbunden sind einerseits diskursive Rahmungen von Anpassung, die permanente Unbestimmtheit und abstraktes Risiko als politische Grundgegebenheiten adaptiver Prozesse an die Öffentlichkeit vermitteln und es somit ermöglichen, verschiedenste politische und wirtschaftliche Maßnahmen oder Strukturreformen unter dem Deckmantel ei-

ner notwendigen Anpassung an den Klimawandel voranzutreiben. Öffentliche Diskurse über die gesellschaftliche Verteilung von Risiken im Beck'schen Sinne der "Risikogesellschaft" (Beck 2009) werden somit als politisch ermöglichendes Moment verstanden, um Ressourcenverteilung, gesellschaftliche Machtverhältnisse (z. B. die Gewährung von "Sicherheit") und den Zugang zu privilegiertem Expertenwissen über die Natur von Risiken im eigenen Interesse zu strukturieren.

Andererseits bezieht sich der Begriff "Politik des Indeterminismus" auch auf konkrete strukturelle und institutionelle Hemmnisse wie den nicht abgeschlossenen Dezentralisierungsprozess in Ghana, die fehlende Koordinierung von Anpassungsmaßnahmen sowie unklare oder sich überschneidende politische Mandate. Diese "Unbestimmtheiten" ermöglichen es gesellschaftlichen Akteuren ihre Partikularinteressen zu verfolgen, begünstigen Korruption in verschiedenen Formen und ermöglichen es intransparenten Netzwerken sich materieller Ressourcen zu bemächtigen, die ursprünglich sozial benachteiligten Gruppen zugutekommen sollten. Die Verwendung von "partizipativen" Beteiligungsformen in Planungsprozessen ist daher in jedem Fall kritisch zu hinterfragen, da Partizipation in hierarchischen (oder in wenig transparenten und unkontrollierten) Entscheidungsstrukturen nicht unbedingt zu progressiven Ergebnissen führen muss, sondern auch rein legitimierende Wirkung entfalten kann. Weiterhin ist im kognitiv-kulturellen Sinne natürlicherweise mit Widerstand gegen gesellschaftliche Neuerungen zu rechnen, was hier nicht im Detail ausgearbeitet werden soll, aber durch umfangreiche Forschungsliteratur in den Bereichen der Transformationsforschung, der Politikwissenschaft, der Organisationslehre, der Umweltpsychologie und des Transitionsmangement bzw. Change Management zu belegen ist. Sollten "win-win" Lösungen keine realistische Option sein, ist zudem mit politisch und wirtschaftlich motivierten Auseinandersetzungen um die gesellschaftliche Ermöglichung transformativer Anpassungspfade zu rechnen.

Zusammenfassend gilt es daher festzuhalten, dass unter Berücksichtigung der empirischen Erkenntnisse der Studie teils positive und teils negative Anpassungsszenarien im Kontext von vier möglichen institutionellen Anpassungspfaden veranschaulicht und diskutiert wurden. Zusätzlich erhebt die Studie im weitesten Sinne den Anspruch, kritische Denkanstöße

für eine realistischere Einschätzung von Anpassungsproblemen zu geben, die gleichermaßen konkrete Planungsperspektiven für Entscheidungsträger eröffnen.

Insgesamt lassen die Ergebnisse der Untersuchung in vielen weiteren Bereichen Forschungsbedarf erkennen. So liegen etwa kaum Untersuchungen zu den konkreten Auswirkungen von Urbanisierungsprozessen in den kleineren und mittleren Städten Ghanas vor, obwohl Urbanisierung dort mittlerweile am schnellsten voranschreitet. Zudem ist es notwendig, die institutionelle Pfadanalyse besser mit bestehenden Landnutzungsmodellen und Klimaszenarien in Einklang zu bringen, um die Robustheit der einzelnen Szenarien weiter zu erhöhen.

Ferner besteht im Bereich der Ernährungssicherheit die dringende Notwendigkeit, sich neben Fragen des Zugangs auch verstärkt mit Fragen der Qualität, der Nutzung und der langfristigen Nutzbarkeit von Ressourcen, Dienstleistungen und Infrastruktur auseinanderzusetzen. Hinsichtlich bestehender Schwierigkeiten in den Bereichen Anpassungsfinanzierung, Bürgerbeteiligung und Dezentralisierung ist zudem eine bessere wissenschaftliche Begleitung und Unterstützung von politischen Reform- und Transformationsprozessen vonnöten, um den aktiven Dialog zwischen Wissenschaft, Zivilgesellschaft, Planungspraktikern und Entscheidungsträgern nicht abreißen zu lassen.

Abschließend ist anzumerken, dass sowohl theoretische als auch ethische Fragen äußerst relevant für die Umsetzung sozialer Transformations- und Anpassungsprozesse sind, etwa im Hinblick auf die Ausdifferenzierung von gesamtgesellschaftlichen Zielen und normativen Wertvorstellungen. Daher ist mit der vorliegenden Arbeit auch das grundlegende Ziel verbunden, einen theoretischen Beitrag zur Fortentwicklung der politikwissenschaftlichen und entwicklungsgeographischen Transformations- und Anpassungsforschung zu leisten.

Stichworte: Anpassungspfade; Klimawandelanpassung; Gesellschaftliche Transformation; Institutionentheorie; Risikoanalyse; Ghana

EXTENDED ABSTRACT

The idea of climate change adaptation is now officially 'mainstreamed' into Ghana's poverty reduction and development strategies at different levels of government. Climate change is commonly seen as a risk for socio-economic development, but also as a 'game changer' and political window of opportunity to address well-known development priorities by adopting an approach that puts the poor and vulnerable at the center. Adaptation policy narratives in Ghana are thus closely linked to familiar development discourses, although new financial instruments and political narratives about 'transformative' development in the context of the Sustainable Development Goals (SDGs) are becoming increasingly influential. The key political entry points for the implementation of adaptation measures in Ghana are currently market-based interventions as well as infrastructure improvement, disaster risk reduction, and natural resource management.

Yet, beyond the thin veneer of dominant policy narratives and transient project interventions, adaptation mostly takes place in the form of autonomous livelihood adaptations by often disenfranchised populations who are confronted with multiple risks, including the negative effects of climate change and increased variability. Developing supportive strategies for the most vulnerable will therefore require an approach that lays emphasis on the wider institutional and political context in which adaptive trajectories unfold. However, a major knowledge gap persists on how complex and politicized institutional settings are shaping both, autonomous and planned adaptation processes in Ghana.

In attending to this knowledge gap, and by focusing on the institutional dimensions of adaptation, this study develops and applies a novel *institutional pathways* approach that sets out to systematically explore the social production of risk – materially as well as discursively – to inform adaptation policy scenarios. This includes the question of how individuals can adapt to rapidly changing environmental and social conditions, and how organizations are prepared to flexibly respond to emerging livelihood

risks that are likely to become more pronounced in the near future. Drawing on information gathered from field research that took place between 2012 and 2013 in the Veua Catchment area in north-eastern Ghana, the main objective of the study is to investigate how power asymmetries, institutions and risk discourses influence human vulnerability as well as present and future adaptation pathways. The underlying hypothesis is that institutional processes – and not climate-related influences – are the primary factor that determines social vulnerability in the research area.

In sum, the study is structured into five parts. At the outset, the introductory chapter presents the natural scientific context for climate-related research in Ghana. Proceeding from the assumption that contested narratives about modernity and risk implicate different models of human development under climate change, the chapter also offers an introduction of basic analytical concepts such as adaptation, vulnerability and disaster risk. These concepts are introduced, discussed, and systematically related to each other. The chapter concludes by reviewing the most pertinent criticisms of the adaptation concept that are currently under debate in the interdisciplinary literature on climate change adaptation and development.

The second chapter deepens the theoretical discussion by engaging with contemporary debates about institutions, discourse analysis and power to better understand how institutions influence the social production of risk, materially as well as discursively. The key motivation is to contribute to theory development in political science and human geography by further exploring a transformative perspective on the institutional dimensions of social life, based on questions of normative sociology and ethics. These conceptual deliberations also provide the bedrock for the development of a novel *institutional pathways* approach to adaptation planning and risk assessment. Four institutional pathway scenarios are introduced as heuristic tools to guide empirical research on the functioning of institutional processes and their possible future trajectories. The chapter closes with a brief description of the research questions, research methods, and selected field sites.

The third chapter then applies select methods offered by the Sociology of Knowledge Approach to Discourse (SKAD) to illustrate how adaptation is discursively framed by adaptation specialists and practitioners at different levels of society. Drawing on quantitative survey data and semi-structured interviews, the ambition is to provide a broad-based overview of relevant adaptation discourses in Ghana. Particular attention is paid to the organizational and material-technological infrastructure (the so-called *dispositif*) on which contested adaptation discourses rest.

In the fourth chapter, the findings of the discourse analysis are tested against the background of a multi-hazard risk assessment (MRA). The aim is to identify differences and similarities between managerial discourses of risk and observed local vulnerabilities. Methodologically, a household survey (n=484 HH) in both, rural and urban areas of the Veve Catchment is combined with qualitative research tools. The selection of field sites allowed for a direct comparison between different farming and irrigation practices as well as between small-scale subsistence farmers, commercially oriented farmers, and non-farm households. Moreover, it was possible to analyze the influence of institutional processes on the distribution of risk, both spatially and socially, among rural and urban populations with diversified sources of income. Facilitated group discussions were held in the research area to triangulate the findings of the quantitative MRA component. The key goal of these group discussions was to learn more about peoples' risk perceptions and adaptation strategies.

In the fifth and last chapter, the results of the study are systematically related to plausible institutional pathway scenarios, namely: (1) adjustment, (2) reform, and (3) transformation. These scenarios are meant to serve as heuristic devices to support decision making. It is neither assumed that any particular institutional pathway presents an optimal adaptation solution nor that there is always a choice between alternative options. Hence the concluding chapter also discusses institutional factors embedded in each of the three adaptation pathways vis-à-vis the regressive tendencies of (4) business-as-usual.

While investigating the possible scenarios, particular emphasis is placed on the inherently political nature of adaptation pathways. It is argued that integrated scenario development with a strong emphasis on the institutional dimensions of social-environmental change can further increase the robustness of adaptation planning. It also allows for realistic and flexible decision making that integrates multiple pathway options into a coherent strategic approach. At the same time, the results of the institutional pathways analysis can be used to reflect on enabling institutional arrangements that are crucial to implement existing adaptation strategies and achieve the progressive political goals of the National Climate Change Policy (NCCP 2013).

Against this background, the first institutional pathway scenario of 'adjustment' is based on the core assumption that the paradigms of technological adjustment and conservative resilience thinking will continue to dominate adaptation policy making in the short and medium term. Especially the agenda of 'climate-proofing' economic development is currently promoted as a key policy response by a variety of influential political actors in Ghana. Moreover, a detailed analysis of organizational discourses at the national, regional and district levels revealed that the understanding of adaptation as adjustment to climatic stressors presently dominates organizational perceptions at multiple levels.

In view of these converging trends, adjustment is a highly probable adaptation scenario that is likely to generate additional organizational feedbacks and shape future adaptation pathways through the distribution of resources and risks. However, the focus of adjustment adaptation is not so much on the social root causes of multidimensional risks and vulnerabilities, but rather on the safeguarding of economic growth and development under conditions of climate change and increased variability. Therefore, it can be argued that technical adjustment approaches alone will not be sufficient to reduce complex vulnerabilities and move multi-layered institutional settings toward more integrated, equitable and forward-looking adaptation pathways.

The second scenario explores under what circumstances a more 'reform'-oriented pathway may be required to complement or enable proposed adjustment measures. Findings show that current attempts at increasing the adaptiveness of Ghanaian farmers and government organizations are still fundamentally constrained by the converging structural problems of unfinished political and fiscal decentralization. In addition, there are challenges related to conflicting and/or overlapping political mandates that hinder effective policy implementation. Yet, how exactly structural reforms could be carried out despite a long history of political resistance at the level of the central government is far from being clear. Moreover, the empirical findings of the study reveal that it is crucial for improving food security and household adaptiveness to avoid an overly narrow planning focus on patterns of access to, for example, infrastructure, credit, services, inputs, markets, etc. Existing problems of utilization, quality control, and long-term reliability need to be addressed as well.

Nevertheless, it has to be acknowledged that dominant organizational interpretations of 'reform' are still primarily concerned with managerial processes. While these aspects are certainly important, it should be borne in mind that attempts at increasing public participation and incrementally reforming top-down governance structures have been beset by many problems in the past, including entrenched standard planning protocols, vested interests, and risk aversion among decision makers. The analysis of dominant adaptation discourses also reveals that reformist policy and planning narratives still exhibit the tendency to naturalize socially produced risk, and to depoliticize adaptation by assuming that complex nature-culture relations are governed by clearly identifiable, benevolent, and neutral institutions.

With regard to the third institutional pathway scenario of 'transformation', it should be kept in mind that the practical translation of transformative institutional pathways depends on how the goals behind the idea of transformation are discursively framed. Like the idea of reform, transformation can be interpreted in both, a more socially progressive or

in a rather conservative way. A socially progressive interpretation of transformation assumes that deep transformations of existing institutional structures and dominant social, political, and economic paradigms are required to avoid negative effects on social equity and the Earth system. A more conservative view of transformation, in turn, is based on the rather narrow definition of transformation as an agricultural policy approach that advocates for a large-scale transformation of food systems in line with the conventional model of industrial agriculture.

Since the latter idea of transformation currently dominates relevant policy discourses, it must be borne in mind that such an approach involves considerable social and ecological risks. If modernization and expansion strategies for rural agriculture are not implemented in a socially equitable manner, it is to be expected that these interventions will create economic dependencies on large corporations and lead to the expropriation of smallholder farmers in areas with scarce land resources, thereby deepening already existing social problems and potentially creating new ones. The general lack of non-farm economic alternatives in northern Ghana, which is further aggravated by the realities of increased climate variability and uneven urbanization, at least suggests that the effectiveness of transformative adaptation strategies hinges on finding the right balance between necessary agricultural modernization, inclusive social development, and increased support for agroecological food systems.

Lastly, the counterfactual 'business-as-usual' scenario points toward institutional voids, overlapping normative reference systems and processual gaps that provide opportunities for regulatory capture and profiteering. Under such a scenario, it is assumed that patronage ties and elite networks may encourage socially entrenched practices like clientelism, corruption and rent-seeking behavior. These practices normally reinforce deep-seated power asymmetries, for instance in cases where resource flows, subsidies or 'pro-poor' interventions are diverted from their intended use. Transient institutional arrangements set up by donor-funded projects may further aggravate such tendencies, since infrastructural adjustment interventions such as the building of bridges and irrigation canals, for example, rarely include provisions for collective and inter-group maintenance into

their project design, thus often leaving the physical infrastructure in disrepair and disuse after several years. In the worst case, business-as-usual may therefore encompass situations in which no sustainable long-term adaptation is undertaken at all.

Hence it is suggested that a progressive transformative perspective on institutional pathways is needed as well to avoid self-referential debates about organizational reform, which neglect the fact that adaptation planning is not a straightforward and normatively neutral approach to addressing risk and vulnerability. The case study on the rehabilitation of the Veia dam clearly illustrates that planning practices are embedded in wider sociocultural, material and political contexts, and that they are guided by contested normative values and paradigms. In other words, it must be considered that planning, project interventions and other power-ridden processes of rational organizing are themselves influencing social risk and vulnerability.

Keywords: adaptation pathways; climate change adaptation; sustainability transformation; institutional theory; risk analysis; Ghana

CONTENTS

<i>Abbreviations and Acronyms</i>	v
<i>Acknowledgements</i>	viii
<i>Glossary of Definitions</i>	xi
<i>List of Figures and Tables</i>	xvi
<i>List of Maps and Pictures</i>	xvii

DEPARTURES

An Adjustment Project Gone Wrong	01
<i>Exploring the Linkages Between Climate Change Adaptation and Institutional Transformation</i>	09

CHAPTER ONE: INTRODUCTION

Research Background	15
Climate Change in Ghana: The Natural Science Base	17
A Brief Political History of Climate Change Adaptation in Ghana....	19
Climate Change Adaptation as Adjustment, Reform and Transformation	30
Adaptation and Disaster Risk Management	42
Vulnerability and Barriers to Adaptation.....	44
The Adaptation Concept and its Critique	52
<i>The Social Construction of Risk: Whither Territorialization?</i>	59

CHAPTER TWO: THEORIES AND METHODS OF INSTITUTIONAL ANALYSIS

Normativity and Institutional Theory in the Social Sciences	64
Toward Transformative Politics: Normative Sociology and the Question of Ethics.....	77
Three Types of Power.....	104
<i>Creating Subjects at Risk: Power as a Discourse</i>	106
<i>Relational Risk: Power and the Institutional Organization of Territoriality</i>	110
<i>Situated Risk: Power as an Event</i>	112
Institutional Adaptation Pathways and Scenario Planning.....	114
Analytical Framework.....	122
<i>Research Questions and Methodology</i>	122
<i>The Veia Catchment as a Field Site</i>	126
<i>Field Research Approach</i>	130

CHAPTER THREE: TRACING ADAPTATION DISCOURSES FROM THE NATIONAL TO THE LOCAL LEVEL

Funding Priorities under the National Climate Change Policy	134
Defining the Dispositif: Policy Translation at the Regional and Sub-Regional Levels	139
<i>Mainstreaming Climate Change Adaptation into Disaster Risk Reduction and Development Planning</i>	139
<i>Decentralization and Structural Challenges for Implementation</i>	141

Expert Views on Adaptation.....	149
<i>International Development Agencies</i>	149
<i>The National Disaster Management Organization</i>	153
<i>Improving Early Warning Systems</i>	160
<i>Agricultural Extension Agents</i>	163
Creating Subjects at Risk? The Politics of Indeterminacy	170

CHAPTER FOUR: ASSESSING SITUATED AND RELATIONAL RISK IN THE VEA CATCHMENT

Overview of the Research Area: Socioecological Trends	178
Multi-Hazard Risk Assessment: Applied Methods	181
Findings of the Quantitative Household Survey.....	184
<i>Demographic Data</i>	184
<i>Housing Conditions</i>	186
<i>Agriculture, Irrigation and Income Diversification</i>	189
<i>Determinants of Adaptiveness? Organizational Support, Social Institutions and Implications for Food Security</i>	200

CHAPTER FIVE: FROM ADJUSTMENT TO TRANSFORMATION?

Emerging Institutional Adaptation Pathways.....	219
' <i>Adjustment</i> '	224
' <i>Reform</i> '	227
' <i>Transformation</i> '	238
' <i>Business-As-Usual</i> '.....	242

Directions for Future Research	245
REFERENCES.....	249
ANNEXES.....	286
<i>Annex 1: List of Expert Interviews and Organizations</i>	286
<i>Annex 2: Ethics Principles for Research</i>	287
<i>Annex 3: Cropping Targets & Output at the Veja Irrigation Project (2001-2012)</i>	290

ABBREVIATIONS AND ACRONYMS

AAP	Africa Adaptation Programme
AEA	Agricultural Extension Agent
ALP	Adaptation Learning Programme for Africa
CBA	Community-Based Adaptation
CBO	Community-Based Organization
CC-DARE	Climate Change and Development: Adapting by Reducing Vulnerability
CSO	Civil Society Organization
DA	District Assembly
DPCU	District Planning and Coordinating Unit
DRR	Disaster Risk Reduction
DRM	Disaster Risk Management
ECOWAS	Economic Community of West African States
ENRAC	Environmental and Natural Resources Advisory Council
EOA	Ecological Organic Agriculture
EPA	Environmental Protection Agency
FAO	United Nations Food and Agriculture Organization
FC	Forestry Commission of Ghana
GAIP	Ghana Agricultural Insurance Programme
GECCA	Ghana Environmental Conventions Coordinating Authority
GHS	New Ghana Cedi
GIZ	German Society for International Cooperation

GMet	Ghana Meteorological Agency
GoG	Government of the Republic of Ghana
GSGDA	Ghana Shared Growth and Development Agenda
GSS	Ghana Statistical Service
HH	Household
ICOUR	Irrigation Company of the Upper Region
ICT	Information and Communication Technology
IPCC	Intergovernmental Panel on Climate Change
ISDR	International Strategy for Disaster Reduction
ISSC	International Social Science Council
MDAs	Ministries, Departments and Agencies
MESTI	Ministry of Environment, Science, Technology and Innovation
MLGRDE	Ministry of Local Government, Rural Development and Environment
MMDAs	Metropolitan, Municipal and District Assemblies
MOFA	Ministry of Food and Agriculture
MOFEP	Ministry of Finance and Economic Planning
MRA	Multi-Hazard Risk Assessment
NAPA	National Adaptation Programme of Action
NADMO	National Disaster Management Organization
NCAP	Netherlands Climate Assistance Project
NCCAS	National Climate Change Adaptation Strategy
NCCC	National Climate Change Committee
NCCP	National Climate Change Policy

NDF	Nordic Development Fund
NDPC	National Development Planning Commission
NGO	Non-Governmental Organization
NI	New Institutionalism
NIE	New Institutional Economics
NREG	Natural Resources and Environmental Governance Programme
RCC	Regional Coordination Council
SADA	Savannah Accelerated Development Authority
SDGs	Sustainable Development Goals
SES	Social-Ecological System
SKAD	Sociology of Knowledge Approach to Discourse
UER	Upper East Region
UNCCD	United Nations Convention to Combat Desertification
UNDP	United Nations Development Programme
UNEP	United Nations Environment Programme
UNFCCC	United Nations Framework Convention on Climate Change
UNU-INRA	United Nations University Institute for Natural Resources in Africa
WASCAL	West African Science Service Center on Climate Change and Adapted Land Use
WRC	Water Resources Commission
ZEF	Center for Development Research

ACKNOWLEDGEMENTS

I gratefully acknowledge the generous help extended by numerous individuals during the writing of this thesis. First and foremost, I wish to thank my supervisors, Prof. Dr. Wolfram Hilz and Prof. Dr. Hartmut Ihne, for their trust and unwavering support. I have always greatly benefitted from their positive outlook and prudent advice. I also like to thank the members of my thesis committee, Prof. Dr. Volker Kronenberg and Prof. Dr. Eva Youkhana, as well as my colleagues at the Center for Development Research in Bonn. In particular, I would like to thank Dr. Irit Eguavoen for being an outstanding and dedicated tutor throughout the entire research process, and Ms. Tabitha Triphaus for her efficient assistance in data management. Further, I want to thank Mr. Antonio Rogmann, Mr. Benjamin Fissmer and Ms. Jelana Vajen for their generous technical support with maps and figures. My special compliments go to Dr. Guido Lüchters for his patience, good spirit, and invaluable expertise. Most importantly, I would like to express my sincere gratitude to Dr. Rapti Siriwardane for being a wonderful person, a true source of anthropological wisdom, and for occasionally reminding me of the more important things in life while I was in the throes of writing. "Thank you!"

Moreover, I am immensely thankful for the logistic and financial support provided by the WASCAL research program. Above all, I extend my sincere appreciation to Mr. Aaron Bundi Aduna whose expertise and generous help was essential for the completion of this study. Furthermore, I wish to warmly thank Dr. Jesse B. Naab, Mr. Emmanuel Yeboah and Mr. Nat Owosu Prempeh for their continued support and encouragement. I also wish to express my heartfelt thanks to Mr. Isaac Kazi and to my research assistants, Mr. Peter Awine Akugre, Mr. Desmond Atambire, Mr. Joseph Nyaaba Mbabila, Mr. Daniel N. Ayamga and Mr. Prosper Atanga, who have been through the highs and lows of field research with me. Without their diligent effort and patience, this work would not have been completed in time. Furthermore, I have

benefited greatly from my discussions with a number of excellent academics at the University of Ghana in Legon. In particular, I would like to thank Naa Prof. Dr. John Nabila, President of the National House of Chiefs, Prof. Dr. Samuel G.A. Adiku at the Department of Soil Science as well as Prof. Dr. Christopher Gordon at the Institute for Environment and Sanitation Studies who have supported me during the research process. I must also thank Prof. Dr. J.M. Assimeng at the Department of Sociology and Dr. Adelina Mensah at the Department of Marine and Fisheries Sciences for their kind collaboration. In addition, I offer my sincerest gratitude to the many professionals who supported this research with their time and expertise. I wish to thank Mr. Baba Tuahiru and Mr. Thomas Ayamga of CARE International Ghana, Dr. Timothy Afful-Koomson at the United Nations University (UNU-INRA) as well as Ms. Susan Gille and Mr. Ken Appenteng-Mensah at GIZ. Acknowledgement is also due to Mr. George Awudi of the Pan African Climate Justice Alliance and Friends of the Earth as well as to Mr. Cletus Achaab, Mr. Matthew Sulemana and Ms. Yvonne Ayaribi at the Ministry of Food and Agriculture. From the National Disaster Management Organization in Bolgatanga, I am grateful to all the staff for their tremendous help and cooperation, especially to Mr. Alfred Saawug for sharing his invaluable knowledge.

Moreover, I sincerely appreciate the generous support of the United Nations Development Programme in Ghana. I am especially grateful to Mr. Joseph Yaw Appiah-Gyapong, Ms. Shoko Takemoto, Ms. Kareff Rafisura and to Mr. Paolo Dalla Stella for their kind help and interest in this research. At the Ghana Agriculture Insurance Programme, I thank Mr. Nicholas Oppong Mensah and Ms. Angelina A. Yeboah. Thanks also go to Mr. Abdul-Razak Saeed and family, Mr. Joseph M. Salifu at the Irrigation Company of the Upper Region and to Mr. Emmanuel Yeboah at the Environmental Protection Agency in Bolgatanga. I also wish to express my heartfelt thanks and warmest regards to the Chief of Vea, Naba Thomas Ayambire Azubire II, and to the people of Vea, Yikene, Namoo, Bolgatanga and Zaare for their incredible

hospitality and support. Moreover, I owe a great debt of gratitude to Ms. Adriana Laslo, Ms. Teodora Dragulescu and the staff of NeViSo for generously hosting me in New Sebrepur. Special recognition also goes to Kumanini Studios, Accra, especially to Mr. Gabriel Opoku Yaw Nimo (a.k.a. Okwabrane) for teaching me a great deal about the nature of 'the political' in Ghana. "Unity is strength!"

Also, I am grateful for the inspiring discussions with fellow researchers of the Earth System Governance Project. In particular, I wish to thank Prof. Dr. Tim O'Riordan, Mr. Ruben Zondervan, Dr. Ayşem Mert and Dr. James Patterson. I also thank Prof. Dr. Janet Newman at the Open University (UK) and Dr. Sebastian Weier at Saarland University (Germany) for their insightful comments.

Lastly, and most importantly, this broad-based research project would not have been possible without the generous financial support provided by the Scholarship Programme of the German Protestant Church (Evangelisches Studienwerk Villigst) and the Foundation Fiat Panis. I extend my sincere gratitude to Prof. Dr. Joachim von Braun and Dr. Günther Manske as well as to Prof. Dr. Knut Berner, Dr. Almuth Hattenbach, and to all of my 'Villigster' friends who have become such an important part of my life over the past years. You know who you are!

"Gye Nyame!"



God bless you.

GLOSSARY OF DEFINITIONS

Adaptation

For the purpose of this study, adaptation will be defined as an iterative social process that aims to reduce → risk, and seeks to increase the ability to avoid risk. Adaptation can be a reactive or proactive effort and may be construed as → adjustment, → reform or → transformation.

Adjustment

Adjustment favors the return to a → normatively desirable state of systemic equilibrium by adjusting to actual or expected → climate change and its effects. In the context of → adaptation, the concept of adjustment is sometimes used to refer to infrastructural approaches and technical solutions, since adjustment does not necessarily imply to address the social root causes/drivers of particular change events.

Climate Change

According to the standard definition by the World Meteorological Organization, climate change refers to a statistically significant variation in either the mean state of the climate or in its variability, persisting for an extended period, typically decades or longer. Climate change may be due to natural internal processes or external forcings, or to persistent anthropogenic changes in the composition of the atmosphere or in land use.

Depoliticization

Depoliticization refers to a critical → discourse and to a field of study. Research on depoliticization explores how → governance techniques may lead to the suppression of alternative views and dissent in political processes due to unequal power relations. Depoliticization also refers to attempts by political actors to conceal, manipulate, ignore or divert attention from knowledge that does not conform with their priorities, goals or desires.

Disaster

A disaster is a serious large-scale event that disrupts the functioning of a particular group or society. A disaster typically exceeds the capacity of the affected group or society to autonomously cope with the effects of the event.

Discourse

Discourses are performative statement practices which constitute reality orders and produce power effects in a conflict-ridden network of social actors, → dispositifs, and knowledge systems. Discourse analysis follows a critical and situational logic, according to which 'truth' is created through shared → normative definitions of reality, but not independent of power relations and social, political, economic, cultural and historical circumstances and practices.

Dispositif

The dispositif describes the → institutional, organizational and technological infrastructure on which → discourses rest and through which they are mediated or translated into real life outcomes.

Exposure

The term exposure connotes a place or location exposed to a → hazard, whereby to be exposed does not mean to be → vulnerable.

Governance

Generally, there are three ways in which the governance concept is used in the literature and in public debates. First, governance can be understood as a scientific concept that is employed to conceptualize and empirically trace → transformations and → institutional interventions in societies. Second, governance can be understood as a → normative program based on the ambition to realize and manage political change. Third, governance also refers to a critical societal → discourse, which is linked to the wider globalization debate.

Hazard

A hazard is a dangerous phenomenon, substance, or human activity that may cause harm. The term hazard therefore describes the cause of occurring harm, and not a harmful event itself. Hazards manifest in harmful events such as → disasters or accidents.

Household

In accordance with the official definition used by the Ghana Statistical Service, a household (HH) is defined as a person or a group of persons, who live together in the same house or compound and share the same house-keeping arrangements. Members of a household are not necessarily related, as non-relatives may form part of a household.

Institution

An institution is a relatively durable cluster of → normative rules, narratives, and practices. Institutions are rooted in the dominant yet contested cultural-cognitive order of a given social configuration, and render stability to a particular form of social hierarchy. Institutions function through the promotion of goals and values, and by enabling or constraining human behavior. Organizations also qualify as institutions, even if their exact properties are subject to debate.

Institutional Pathways Approach

A planning approach that combines qualitative and quantitative methods to determine how → adaptive trajectories are → institutionally embedded and spatially and temporally evolving.

Mainstreaming

Mainstreaming refers to a top-down sociopolitical process that seeks to → normalize certain policy objectives, narratives or → discourses in and across societies, bureaucracies and organizations, including the media.

Normativity

The term normativity refers to cognitive-cultural constructions of reality that exist prior to the arrival of the individual into this world, and with which the individual necessarily engages during processes of socialization. This means that the way in which individuals understand each other in an intersubjective manner is a direct consequence of the normative worldview of the collective in which they are socialized. A normative worldview consists of conceptual systems according to which the 'true' and 'false' are separated, and specific effects of power are attached to the true. While there is still human agency and choice concerning these concepts, for instance in the case of contestation and rejection, normative systems are surprisingly resilient. Thus, norms function as social ordering principles. Group-based inequalities and the unequal distribution of power and resources require justification and maintenance through normative regimes of 'truth'.

Reform

Reform refers to the goal of improving particular attributes of a given reference system without altering its fundamental properties. In the context of → adaptation, the notion of reform is used to describe incremental responses to actual or expected → climate change and variability. Reformist adaptation neither advocates for the status quo nor endorses fundamental systemic or paradigmatic change.

Resilience

Resilience refers to an ideal state of current or future adaptiveness.

Risk

The umbrella term risk describes the likelihood of incurring harm or a damage potential that may result from a potential threat. Risk is the product of → hazards, → vulnerability, → exposure and → adaptation. More technical definitions see risk as objectively quantifiable, while more critical definitions understand the notion of risk as a → normative

social construct and as a potential driver of → depoliticization. Perceptions of risk differ among various actors and interest groups, and according to their socio-cultural backgrounds.

Transformation

Transformation alludes to a shift in the fundamental attributes of a system or society, often based on altered → norms, goals, paradigms or values. Transformations can occur in technological, socio-ecological, biogeochemical, or financial systems, and in regulatory or political regimes. The notion of transformation also includes the opportunity that → adaptation presents to graduate from a given state of systemically produced → vulnerability to a new and better system. Transformation differs from → adjustment and incremental → reform due to its focus on fundamental systemic change.

Transition

Transition refers to a dynamic process as opposed to an outcome or a goal and denotes the incremental alteration of systemic or social properties. The final outcome of a transition process may be → adjustment, → reform, or → transformation. In the worst case, a transition process may even lead to regression or business-as-usual.

Vulnerability

Vulnerability is the degree (severity, frequency or magnitude) to which an element at → risk is likely to experience harm. Thus, it refers to a propensity or susceptibility to suffer harm or loss and is typically associated with a wide range of biogeochemical, technological, social, political, cultural, economic and → institutional characteristics.

Disclaimer: For better readability, no citations are provided in this glossary. However, some of the definitions therein contain ideas and formulations that are not solely those of the author. When used in the main text, all definitions are supported with appropriate sources.

LIST OF FIGURES AND TABLES

Figures

Methodology	14
Organizational Architecture of Climate Change Adaptation and Disaster Risk Reduction in Ghana	29
The Institutional Organization of Territoriality	111
Institutional Adaptation Pathways	119
Range of Institutional Pathway Scenarios.....	121
Risk Perception of NADMO Specialists in the Bolgatanga Municipal District	155
Risk Perception of NADMO Specialists in the Bongo District	156
Perception of Farmers' Income Diversification Strategies by Agricultural Extension Officers in the Bongo District	168
Perception of Farmers' Adaptation Strategies by Agricultural Extension Officers in the Bongo District	169
Highest Level of Formal Education in the Household (Rural).....	185
Highest Level of Formal Education in the Household (Urban)	186
Risk Perceptions of Household Heads in the Veua Catchment	202

Tables

Historical Outline of Adaptation Policy Processes in Ghana	24
Three Heuristic Categories of Climate Change Adaptation	42
Key Theoretical Concepts	49
Agricultural Production at Field Sites	128
Institutional Mediation of Household Access to Resources	130

Priority Adaptation Programs of the NCCAS	139
Rural and Urban Households in the Veia Catchment Area.....	182
Selected Communities in the Veia Catchment Area	183
Schematic Cropping Calendar for Typical Staple Crops.....	194
Food Security Calendar.....	195

LIST OF MAPS AND PICTURES

Maps

WASCAL Partner Countries	16
WASCAL Research Area in the West Sudanian Savanna Belt.....	16
Field Sites	129
The Veia Irrigation Project.....	197

Pictures

Veia Irrigation Dam	06
Drought Impacts on Crops in Northern Ghana	47
Flood Maps in the NADMO Regional Office, Bolgatanga.....	158
Pump Irrigation at the Veia Irrigation Scheme.....	167
Typical Vernacular Architecture in the Research Area	188
Storm Impacts in Bolgatanga, Upper East Region	189
Land Preparation in the Bongo Area	193

DEPARTURES

An Adjustment Project Gone Wrong

Police in the Upper East Region have allegedly shot dead, one man at Veia in the Bongo district, while protecting a contractor doing some maintenance works on the Veia Irrigation Dam, from angry protestors from the community.

(Joy News, Ghana, FEB 6-2013)

On February 6, 2013, a group of construction workers commenced planned maintenance work on the Veia irrigation dam in the Upper East Region of Ghana. On the same day, a young man named Azaare Aniah, a well-known community leader and student at the Winneba College of Education, died when he was struck by a bullet fired from a police officer's gun, while he was participating in a protest march against the construction works. Several other people were wounded and arrested as police sought to disperse the rally.

The protest march hardly came as a surprise, since the rocks that were selected as raw materials for the maintenance works were perceived to belong to a traditional shrine and abode for ancestral spirits. Organized protests against the blasting of the rocks had already erupted in 2012 and 2013, when construction workers were repeatedly denied access to the rocks by concerned residents and the members of a local youth group.

The earth priest, or *tindaana* of Veia quickly emerged as a figurehead for the protest movement, due to his role as a traditional authority and custodian of the land. In organizing the protests, he claimed to act on behalf of the people's spiritual and cultural needs, given such 'blatant disregard' of traditional values by the contractor and the state authorities who had commissioned the blasting of the rocks.

News about the tragic death of Azaare Aniah had only reached me when I was preparing for the final months of my field research in Ghana's northern savanna zone. During a short conversation over the telephone, a colleague of mine informed me that a relatively unknown group calling themselves 'the youth of Ve'a' had published an open letter on a major Ghanaian news website, accusing members of the local police force of 'brutish murder'. When I came to read the letter during the following week, I gradually learned more about the circumstances that ultimately led to the death of Azaare Aniah. The open letter, which was published on the internet shortly after the shooting, stated that:

The shooting and killing of the late Azaare Aniah took place under superior orders rather than professional incompetence as some of them want us to believe (...) The police and the contractor may succeed in blasting the land because they are using weapons which give them power over the people but what the police must know is that they are sowing seeds for conflicts between the people of Ve'a and their chief which has a very high tendency of escalating into sectional community war (Ghana Web 2013, n. pag.).¹

At first, I did not make a connection between my research on climate change adaptation and the controversy surrounding the blasting of the local shrine. It was only after some weeks that I came to realize the significance of the event: while I was revisiting a draft document of the National Climate Change Policy (NCCP) that had just been released by

¹ The institution of chieftaincy in Ghana dates back to pre-colonial times and is officially enshrined in the Ghanaian constitution of 1992, Article 270 (1), and the Chieftaincy Act 759 of 2008. The chief, also referred to as *naba* in the Upper East Region of Ghana, is considered the customary ruler of a traditional area who, hailing from the appropriate family and lineage, has been validly elected and enstooled, enskinned or installed in accordance with customary law. The chieftaincy system is organized in a hierarchical manner and headed by so-called *paramount chiefs*. In addition to their traditional role, most chiefs entertain close ties to government and development organizations.

the government, I realized that infrastructural adjustment was promoted as key adaptation policy response by a variety of political actors.² However, in light of the violent incident in Veia, it became readily apparent that cultural and political questions surrounding the implementation of adjustment interventions were oversimplified or neglected in most accounts of adaptation policy and planning. Thus, I eventually decided to further investigate the events preceding the community protests on February 6, 2013.

In the beginning of 2013, I had already worked in northern Ghana for more than half a year. Thus, I was well aware of the complaints about the bad state of the Veia dam that had been raised by local residents. In fact, the bad condition of the Veia irrigation facilities had been an issue of contention among local farmers for many decades (see England 1995). The Veia dam was gradually built between 1965 and 1980 for multiple purposes such as dry season farming, small-scale fisheries and the provision of drinking water. It had ever since served as an important source of livelihood for the people in the surrounding towns and villages. Yet no major rehabilitation work had taken place since the completion of the dam in the 1980s. This situation naturally led to a slow erosion of the dam's walls and resulted in the siltation and subsequent blockage of irrigation canals and drainage systems. As a consequence, many small-scale farmers had to abandon their farmlands, or had to resort to resource intensive motor pump irrigation in the upland areas of the irrigation scheme.

At first, political attempts to resolve these long-standing grievances seemed promising, especially in view of successful negotiations between the government of Ghana and several international donor agencies. In 2004, a considerable grant was expedited under the World Bank-led Urban Water Project in order to increase access to improved water supplies. As an integral part of the project, infrastructural adjustment work on water supply dams and weirs was supported with

² See NCCP 2013, p. vi; Ghana Goes for Green Growth 2010, p. 12; IPCC 2014b, p. 86.

\$5 million by the Nordic Development Fund (NDF). According to media reports, \$2 million of the total NDF funding were specifically allocated for the rehabilitation of the Veia dam.³

Construction work at Veia officially began in 2010, when a firm named Eunitack Services Ltd. was awarded a service contract by the Ghanaian government. However, in 2012 – halfway into the project – an open dispute broke out between the *tindaana* of Veia and the contractor who claimed that blasting the rocks of the local shrine was unavoidable to complete the rehabilitation works. As disputes over the religious site became more prevalent, media reports stated that the earth priest had supposedly asked the contractor to either stop attempts at destroying the cultural heritage of the community, or "face the wrath of his deities and the youth of the area" (Daily Guide 2012, n. pag.).

At this point, however, a memorandum of understanding had already been signed between the chief of Veia and the contractor. Further details of the memorandum only became public as the project manager of Eunitack Services Ltd. alleged in an interview that compensation for the use of the rocks had been paid to the chief:

We even went to the Chief of Veia ... and he asked that we pay him some compensation. We have paid him and provided money to perform all the required customary rites. We have met all the conditions they asked for including employing the youth of the community to work with us so as to enable them earn some income, we have initiated measures to remedy any possible damage that may result from the project work. We have also pledged and indeed put in place measures to replenish any portion of the land that may be affected by the project since we would be blasting some rocks to use for the work, yet after meeting all these conditions the work has come to a halt because of the *tindaana* (Daily Guide 2012, n. pag.).

³ Taken from project statistics published by the World Bank (2004, p. 7). Also see Daily Guide 2012.

While I discussed the memorandum during an interview with staff of the Veia irrigation facilities, it was mentioned that Eunitack Services Ltd. had apparently transferred a considerable sum of money to the account of the chief before attempting to access the rocks.⁴ I was also told that unconfirmed allegations had apparently been made by local residents who lived close to the shrine, and who claimed that compensation payments had never reached them.

In the meantime, maintenance work on the Veia dam had been delayed considerably and the Regional Coordinating Council had come under increased public pressure. Government authorities were called upon by concerned citizens to intervene politically with the hope of preventing project funds from being returned to international donors. The local press reported that several mediation efforts by the Regional Security Council of the Upper East Region (REGSEC) and the paramount chief of the Bongo traditional area had been to no avail, because the *tindaana* of Veia would stubbornly refuse to "pacify the gods" (Ghana News Agency 2013a, n. pag.).

The *tindaana* and his followers immediately rejected these press reports and continued their opposition, claiming that they had suggested other rocks in the vicinity of the dam, including those from a nearby quarry.⁵ These offers were nevertheless deemed unacceptable by the Regional Minister and Eunitack Services Ltd., and it was argued that utilizing rocks from other sources would incur additional costs and cause further delays (Ghana News Agency 2013b, n. pag.).

⁴ Field notes: 16 February 2013, Veia town. The responsible company for the management of the Veia irrigation scheme is the *Irrigation Company of the Upper Region* (ICOUR), a company owned and financed by the government of Ghana.

⁵ Field notes: 18 February 2013, Veia town.

Picture 1. Veia Irrigation Dam



© Author, 2013

In spite of ongoing protests, the REGSEC finally ordered Eunitack Services Ltd. to resume work on the dam's walls on January 16, 2013. After taking this decision, the chairman of the REGSEC – who also served as the acting Upper East Regional Minister at the time – officially announced to the press that the government had decided to provide security for the contractor and appealed to members of the Veia community, and especially the *tindaana*, to remain calm and allow the maintenance work to continue. In his press statement the chairman emphasized that the decision was solely taken "in the interest of the majority of the people in the region who depended on the dam for survival" (Ghana News Agency 2013a, n. pag.). He further stated:

If the dam is not worked on now it will collapse and this will affect the people in the entire region greatly. We will also lose the 25 million dollars [sic] from Nordic Development Fund (Ghana News Agency 2013a, n. pag.).

The acting minister then publicly warned the people of Veā that "anybody who would want to mar the process would be dealt with drastically". He also mourned the "gross disrespect" that the *tindaana* and his followers had allegedly shown for the council, the chief of Veā, and for the paramount chief of the Bongo area (Ghana News Agency 2013a, n. pag.). In turn, the Veā youth group and other residents heavily criticized the chiefs and the local authorities, including the regional minister, for supporting the contractor in his attempts to destroy the traditional shrine without respecting the cultural heritage and constitutional rights of the community. When construction workers finally arrived at the shrine on the morning of February 6, 2013 and begun blasting the sacred rocks under the protection of the local police force, the protest erupted during which Azaare Aniah was shot and killed.

After coming to terms with the tragic death of a young man, one lesson that can be learned from these events is that notions of culture and religion can become highly politicized. In fact, they are often used as supportive arguments in power struggles over material and symbolic resources such as financial flows related to development projects and the 'traditional' leadership roles of local chiefs or earth priests. In the northern savanna zone this conflict-ridden situation is further aggravated, since the societies of the region "continue to organize their lives and the use of land around the institution of the (...) earth priests" whereas "the chiefs no longer respect the position of the earth priest and, in general, (...) indigenous methods of dispute resolution are being ignored" (UNDP 2012, pp. x and 56). As the Veā case illustrates, there are still considerable tensions between earth priests and chiefs concerning usufruct rights, allodial rights and land ownership. These unresolved tensions have the potential to stall even so-called 'bottom-up' processes, mainly because the *tindaanas* – who have often compromised with the chiefs in the past over issues of community development – now wish to "re-assert their rights as landowners" (Awedoba 2010, p. 98).

Customs related to the earth thus have to be placed in a wider political context in northern Ghana. Traditional leaders enter in various complex relationships with the bureaucratic state, whereas state authorities and politicians frequently seek to align themselves with coalitions of traditional leaders to advance their own strategic priorities. For example, since the majority of the population in Veia is of Christian faith (79.5 percent) – as opposed to a minority of traditional worshippers (14.9 percent) – tactics to politicize religious matters have been repeatedly employed by a coalition between the state administration, the contractor and the chief to outmaneuver political opponents.⁶ Especially the portrayal of traditionalists as backward people who allegedly cling to "outmoded customs which could impede on development in the region and the country as a whole" fell on fertile ground among many followers of Christianity and Islam, who frequently frown upon traditional practices (Ghana News Agency 2013b, n. pag.).

Statements that conflict resolution capacities in the region are fairly high based on community solidarity and the influence of traditional leaders such as chiefs and earth priests thus have to be considered superficial at best, and outright risky at worst, depending on the concrete policy and planning context (compare, for instance, Nanedo *et al.* 2014, p. 18-20).

We may then ask what became of the rehabilitation of the Veia dam? In late 2014, ten years after the contract for the Urban Water Project had been signed, and almost five years after rehabilitation works in Veia had officially begun, the managing director of ICOUR had to reveal to the press that the Veia irrigation project needed to be shut down, since the dam infrastructure was in a bad condition and the lake on the verge of drying up. This detrimental outcome of the rehabilitation process aggravated existing livelihood challenges and negatively affected dry

⁶ Taken from official records kept at the palace of the chief in Veia. All numbers are based on a community survey conducted by the University for Development Studies (UDS, Tamale) in 2008/2009. The study indicates a total population of 6.714.

season farming as well as food security in the region. Hence it has become painfully clear that a thorough knowledge of complex institutional and cultural settings is an absolute necessity to avoid prolonged social conflicts which may potentially stall the implementation of proposed adaptation measures. This applies even to situations where positive sentiments toward infrastructural adjustment projects might prevail among the population, and 'bottom-up' and 'top-down' policy approaches are pursued in tandem.

*Exploring the Linkages Between Climate Change Adaptation
and Institutional Transformation*

The year 2015 has been called a crucial year for both, Africa's development and climate change action. On the one hand, the year has seen a political paradigm shift toward 'transformative' development in the debate on the post-2015 Sustainable Development Goals (SDGs). On the other hand, adaptation has been heralded as a key component for responses to climate change in the aftermath of the 2015 Paris Conference of the UNFCCC. In view of the paradigm shift toward transformative development, scientists and practitioners have been quick to note that development and climate change adaptation should *not* be regarded as two separate political issues. The key link between the two political agendas – transformative development and climate change adaptation – is the need to finance and implement socially just and environmentally sustainable responses to social as well as environmental pressures in a way that will benefit the most vulnerable countries. In particular, the African Union's *Agenda 2063* stresses the need to "transform regional and continental institutions and the manner in which we do business, so as to effectively lead and drive the agenda for transformation" and enable African countries to implement their own localized

visions of adaptation plans, systems and structures (African Union 2014, p. 19).

But how can such integrated and 'transformative' adaptation responses be implemented in practice? What kind of adaptation policy mix will be required to support institutional transformation at the national and sub-national levels? Moreover, how can growth-oriented economic development strategies be implemented in coherence with a transformative agenda that emphasizes accountability, environmental sustainability and social justice? Focusing on the case of Ghana, and by combining a pathways perspective with insights from critical institutional theory, risk assessment and discourse analysis, this study engages with these pertinent questions – theoretically as well as empirically.

In Ghana, climate change adaptation is now officially 'mainstreamed' into development planning at different levels of government, while policy translation into local contexts is still limited in scope. Thus far, the key entry points for the implementation of adaptation actions are market-based interventions as well as infrastructure improvement, disaster risk reduction and natural resource management with a focus on agriculture. However, beyond the thin veneer of official policy narratives and sporadic project interventions, adaptation largely takes place in the form of autonomous livelihood adaptations by rural farming households and often disenfranchised peri-urban and urban populations who are confronted with multiple social and environmental stressors. In sum, a major knowledge gap persists on how complex and politicized institutional settings are shaping autonomous livelihood adaptations in Ghana. As the case study on the rehabilitation of the Veia dam has illustrated, there is indeed "much more to politics than the formal arrangements for representation, decision making and policy implementation" (Lowndes and Roberts 2013, p. 1).

In other words, the richness and diversity of institutional life cannot be limited to specific legal and managerial processes, as institutions also

express diverse values, traditions, worldviews, beliefs and socio-political norms. These interrelated aspects of institutional life are nevertheless seldom considered – let alone systematically explored – in more conventional adaptation studies and risk assessments. While institutional life generally spawns much diversity, there is still a tendency in adaptation theory and practice to exclusively focus on organizational and managerial processes related to the state administration and international development agencies. Institutional life is then primarily perceived through the lens of bureaucratic tasks such as risk assessment, risk reduction, coordination, prioritization, and information management (see Foti *et al.* 2011).

While these organizational tasks are certainly important, the findings of the preliminary case study demonstrate that there is an urgent need to better comprehend how institutions interact across scales, space and time to mediate and/or produce *risk* in the social sphere. Concomitantly, under conditions of deep uncertainty, when we are faced with questions that we "have not posed but which are imposed on us, faced with situations that do not let themselves be staged in the laboratory because they integrate an ill-defined number of interrelated variables", making reliable predictions about future adaptation scenarios or 'pathways' becomes an increasingly daunting task (Stengers 2000, p. 158).

Thus, given the need for more integrated and forward-looking research that lays emphasis on the institutional and structural aspects of adaptation, I will develop and empirically test an institutional pathways approach that sets out to systematically explore the *social production of risk* – materially and discursively – to inform adaptation policy scenarios. This includes the question of how organizations themselves can adapt to rapidly changing environmental and social conditions, and how they are prepared to flexibly respond to emerging livelihood risks that are likely to become more pronounced in the near future.

In accordance with this overarching objective, the study is structured into five parts. At the outset, the introductory chapter presents the historical and natural science background for the development of adaptation policies in Ghana and critically explores conceptual state-of-the-art debates in the fields of climate change adaptation, disaster risk reduction (DRR) and vulnerability research. By systematically relating conceptual debates to each other, theoretical and empirical gaps in research on climate change adaptation in Ghana will be identified.

In the second chapter, I set out to systematically address the identified research gaps by developing a 'transformative' approach to institutional theory and analysis. To develop such a novel transformative perspective on the institutional dimension of social life – a perspective that is not only able to account for the social production of risk but is also cognizant of the *more-than-human* dimension of ethics (e.g. animals and the living environment) – I will combine a critical reading of institutional theory with a sociology of knowledge approach to discourse.

Engaging in such a broad and complex theoretical endeavor arguably requires a critical re-evaluation of the various normative strands that have evolved in social and institutional theory. From an empirical perspective, I argue that developing a transformative approach to institutional analysis necessitates a strong focus on cultural-cognitive, normative and discursive processes of meaning-making on the one hand, and the concrete materiality of landscapes and resource flows on the other. Based on these ontological and epistemological reflections, I present an integrated framework for institutional analysis that contains empirical methods, detailed research questions and a brief description of the selected field sites. Four possible *institutional pathway scenarios* will serve as analytical points of reference to map the emerging political debate on climate change adaptation. These scenarios are: (1) adjustment, (2) reform, (3) transformation and, as a counterfactual scenario, (4) business-as-usual.

Chapter three then marks the beginning of the empirical discussion, and proceeds to explore how climate change adaptation is perceived and discursively framed by adaptation experts and practitioners at different levels of government. In applying select methods offered by the Sociology of Knowledge Approach to Discourse (SKAD), the key goal is to better understand how contested views of risk and vulnerability shape the implementation of adaptation policies in Ghana. Here, the four adaptation policy scenarios will serve as analytical points of reference to map the linkages between different normative visions of adaptation and expert perceptions of risk.

In the fourth chapter, the empirical findings of the discourse analysis will be tested against the background of a structured risk assessment to illuminate the differences as well as the similarities between managerial discourses of risk and observed local vulnerabilities. Assuming that discourses about adaptation and risk do not readily translate into material and policy outcomes, the primary goal of the fourth chapter is to better understand the role of institutions as mediating factors between climate-related hazards and human well-being.

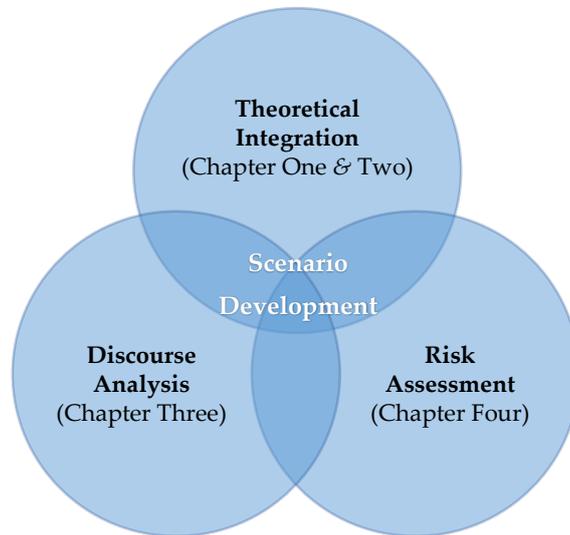
To this end, a quantitative risk analysis (n=484 HH) in both, rural and urban areas of the Veua Catchment has been combined with qualitative research tools. The overall selection of field sites allowed for a direct comparison between different farming and irrigation practices as well as between small-scale subsistence farmers, commercial farmers, and non-farm households.⁷ Moreover, since the portfolio of livelihood activities in the research area has become moderately diverse over time, it was possible to analyze risk distribution, both spatially and socially, among rural and urban populations with diversified sources of income. The following field sites in the Veua Catchment have been visited: Veua-Gunga, Zaare Amoabisi, Namoo-Akunka and Yikene Adohbisi

⁷ Occasionally, subsistence farmers in the area are also called *sub-subsistence farmers*, as their farm produce is largely insufficient to sustain a family throughout the year.

(*rural*); Bolgatanga-Sawaaba and Bolgatanga-Damweo (*urban*); as well as the Veia irrigation project (*rural, commercial farming*).

The fifth chapter then compares the study findings to the four institutional pathway scenarios of (1) adjustment, (2) reform, (3) transformation, and (4) business-as-usual.

Figure 1. Methodology



CHAPTER ONE: INTRODUCTION

The introductory chapter presents the natural science base for climate-related research in Ghana. It also illustrates how adaptation policy has developed historically in the country and describes the organizational architecture that is related to this cross-cutting policy domain. Proceeding from the basic assumption that contested narratives about nature-society relations, modernity and risk implicate different models of human development under climate change, the chapter offers an introduction of key concepts such as adaptation, disaster risk management and vulnerability. The chapter concludes by reviewing the most pertinent criticisms of the adaptation concept that are currently discussed in the interdisciplinary literature on climate change adaptation and development.

Research Background

This study is carried out as part of the West African Science Service Center on Climate Change and Adapted Land Use (WASCAL). WASCAL is a regional international organization under the Economic Community Of West African States (ECOWAS) and partially funded by the German Federal Ministry of Education and Research (BMBF). Since 2012, the organization is exploring new pathways to enhance the adaptiveness of human and environmental systems in West Africa against the backdrop of climate change and increased variability. WASCAL is organized around three main components: the Competence Center for climate-related information and research services in Ouagadougou, Burkina Faso, the Core Research Program, and the Graduate Studies Program.

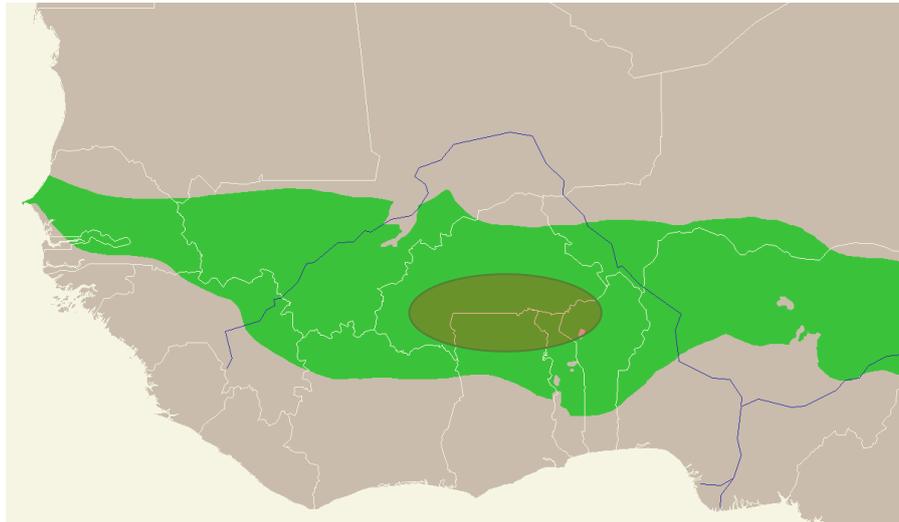
Ten West African countries and various German and African research institutions cooperate in the WASCAL framework, including the Center for Development Research (ZEF) in Bonn, Germany.

Map 1. WASCAL Partner Countries

- Benin
- Burkina Faso
- Côte d'Ivoire
- Gambia
- Ghana
- Mali
- Niger
- Nigeria
- Sénégal
- Togo

Source: WASCAL Project

The main WASCAL research area is the Sudanian savanna belt of West Africa, which is seen as the "potential breadbasket" of the region (WASCAL 2012). Under Work Package 4.4. of the WASCAL Core Research Program (*Politics of Adaptation*), the study explores the political and institutional aspects of climate change adaptation in Ghana.

Map 2. WASCAL Research Area in the West Sudanian savanna belt

Climate Change in Ghana: The Natural Science Base

Ghana is a unitary democratic republic located in West Africa, between latitudes 4.5°N and 11.5°N and longitude 3.5°W and 1.3°E (GoG 2011). The country is divided into three major climatic zones: the West Sudanian savanna belt in the northern part of the country; the tropical forest zone in the south-west; and the Accra planes that lie in the coastal areas of the south. The research area in the northeast is characterized by an unimodal climate with a rainy season that runs from May to October, and a long dry season for the rest of the year, with hardly any rainfall (Bolgatanga Municipal Assembly 2010, GoG 2011). Precipitation patterns during the rainy season are often erratic and therefore hardly predictable, whereas the dry season brings strong 'harmattan' trade winds.

Empirical evidence for climate change in Ghana is commonly related to rising temperatures and increases in climate variability. While available statistical data show no clear signs of a long-term shift in precipitation patterns or the onset of the rainy season, there is evidence to suggest that dry spells during the rainy season have increased (Riede *et al.* 2016). Extreme weather events such as storm surges, heavy rainfall and flooding also occur regularly in the country. However, these extreme events are not easily attributable to long-term climate change and may well be related to climatic variability (Dietz *et al.* 2004, Arku 2012, p. 353). There is, for example, no clear indication that extreme rainfall events in Ghana have either increased or decreased since the 1960s, and climate change projections, especially for future precipitation, remain highly uncertain (Stanturf *et al.* 2011, p. 1-2).

Nevertheless, there is still ample evidence to suggest that climate change has already become a reality in Ghana, as historical data for the period from 1960-2000 indicate "a progressive and discernible rise in temperature " (EPA 2007, p. 5).

More specifically, it can be said that the mean annual temperature in the West Sudanian savanna zone of Ghana increased from 28.1°C in the year 1960 to 29.0°C in the year 2000 (GoG 2011, p. 121, World Bank 2011, p. 4). Future climate scenarios based on historical weather data confirm these trends and predict a continuous rise in temperature with an average increase of 0.6°C, 2.0°C and 3.9°C by the year 2020, 2050 and 2080 respectively (EPA 2007, p. 5). This is more than 1½ times the global average rate (Tachie-Obeng *et al.* 2010, p. 2). At the same time, an average decline in rainfall of 2.8 percent by 2020, 10.9 percent by 2050 and 18.6 percent by 2080 is predicted for all agroecological zones of the country (EPA 2007, p. 6). Regarding the decline in rainfall there are, however, some caveats. A general decline in rainfall has been reported throughout West Africa over the past 50 years and may, in the long term, be attributable to a southward shift in the seasonal migration of the Inter-Tropical Convergence Zone (Weldeab *et al.* 2007, Owusu and Waylen 2009).

Bearing in mind the scarcity of data for future climate scenarios, it can be concluded that changes in the intra-seasonal variability of rainfall will have the most severe impact on peoples' livelihoods and food security, for they negatively affect the production of both cash and staple crops (Yaro 2013a). Moreover, while meteorological data for the region confirm that dry spells are becoming more frequent and intense during the planting season, it is important to keep in mind that a simplistic relationship between environmental factors and human vulnerability should not be assumed. A close investigation of the complex interplay between environmental, political, social, institutional, cultural, technological, and economic root causes of vulnerability is therefore required to assess individual adaptation needs. The following section paves the way for such an integrated assessment by providing an overview of the historical development of climate change adaptation policy in Ghana, and by charting the organizational architecture that is related to this cross-cutting policy domain.

A Brief Political History of Climate Change Adaptation in Ghana:

As a result of Ghana's long-standing involvement in the international climate regime, dating back to the ratification of the UNFCCC in September 1995, awareness for climate change has been gradually rising among Ghanaian decision makers at all administrative levels and across sectors. The empirical findings of the study support this overall trend based on the personal statements of nearly fifty scientists, development specialists, government professionals and opinion leaders who unequivocally agreed to the fact that climate change has already become a reality in Ghana. All of the interviewees, young urban professionals as well as village elders in rural areas, noticed an observable change in precipitation during the rainy season.

Depending on the individual case, there are certainly reasons for doubt with respect to these perceptions, mostly because of the ways in which international development discourses are adopted into local political contexts and filled with new meanings (see Eguavoen *et al.* 2015, Eguavoen and Schraven 2013, p. 214). Yet these broad statements about climate change are at least indicative of the fact that the relationship between human well-being and the environment is a common topic in a country that is located in one of the harshest and most complex climatic regions of the world. In particular, the northern savanna zone of Ghana is characterized by high climatic variability, high levels of poverty and population growth, as well as low levels of food and nutrition security (Armah *et al.* 2011).

Overall, more than 80 percent of the disasters occurring in Ghana are considered to be climate-related, while many households depend on rainfed agriculture for their livelihoods (NCCP 2013, p. 31). These environmental trends and conditions present a considerable challenge for the economy as well as for human well-being and social service de-

livery. However, it has to be considered that these severe weather conditions are not new to West Africa, or to Ghana in particular. Farmers are traditionally experts in livelihood adaptation and possess a detailed knowledge about changes in environmental conditions such as rainfall patterns, recurring drought periods, and soil quality. What is indeed new is that the adaptive capacities of agricultural households are largely insufficient to withstand the shocks that result from the strong convergence of increasing socioeconomic, institutional and environmental pressures (Yaro 2010). As a result, farm households have little options for income diversification and struggle with food and livelihood insecurity as they are often forced to use most of their productive assets during the lean season (Nkegbe and Kuunibe 2014).

In view of these challenges, it is clear that the driving force behind the growing political interest in climate change issues is to increase the security and well-being of the populace and to attract additional funding to finance Ghana's adaptation and development needs. In the period from 1995 to 2010 the country received a total amount of 240 million US \$ for climate change related activities, of which 28.5 million were allocated for adaptation, and 126.4 million for low carbon growth (Würtenberger *et al.* 2011, p. 13). Still, climate change remains a formidable challenge for Ghana's predominantly agrarian economy. It is a strongly held belief among administrative authorities and politicians that climate change may jeopardize food security as well as development gains in climate-sensitive sectors such as cocoa production, tourism, forestry, and hydro-electric power generation (EPA 2007). It is also widely recognized that climate change threatens to propel internal migration to urban centers, increase health risks, and place additional pressures on institutions and resources. Furthermore, it is expected that additional expenditures for disrupted value chains, emergency relief and post-disaster rehabilitation will significantly reduce the potential for economic growth and the funds available for poverty reduction or environmental rehabilitation.

Therefore, to improve environmental governance and natural resource management, and to facilitate organizational reforms as well as capacity building, the Government of Ghana (GoG) cooperated with international development partners such as the World Bank to establish the *Natural Resources and Environmental Governance* (NREG) program in 2008. NREG serves as a mechanism for technical assistance and multi-donor budget support in the natural resources and environment sector. The Ghanaian government supervises the implementation of the program and controls the release of funds to the responsible sector agencies. Higher-level oversight of the NREG program is entrusted to the Environmental and Natural Resources Advisory Council (ENRAC) that meets under the chairmanship of the Vice President of the Republic of Ghana. Furthermore, the Ghana Environmental Conventions Coordinating Authority (GECCA) has been established as a coordinating entity for activities that are carried out under the three Rio Conventions (UNFCCC, UNCCD, CBD) and other multilateral environmental agreements.

The two main organizations responsible for the development and monitoring of climate change policies in Ghana are *the Ministry of Environment, Science, Technology and Innovation* (MESTI) and its subsidiary body, the Environmental Protection Agency (EPA). According to its mandate, the MESTI also collaborates with several other institutions⁸ to ensure that climate change is mainstreamed into all facets of development planning, as outlined in the Medium-Term National Development Policy Framework, *Ghana Shared Growth and Development Agenda 2010-2013* (GSGDA I 2010). This important policy document frames climate change primarily as an issue of development. It also underlines

⁸ These institutions include the Ministry of Finance and Economic Planning (MOFEP), the National Development Planning Commission (NDPC), the Ministry of Local Government, Rural Development and Environment (MLGRDE), the Ministry of Food and Agriculture (MOFA), the Ghana Meteorological Agency (GMet), the National Disaster Management Organization (NADMO), the Ministry of Lands and Natural Resources, and the Ministry of Health, among others.

the need to harmonize policies across sectors in order to reduce climate-related risks and build resilience. Furthermore, guidelines for the Metropolitan, Municipal and District Assemblies (MMDAs) have been released by the National Development Planning Commission (NDPC 2013) to coordinate the implementation of the Ghana Shared Growth and Development Agenda until 2017 (GSGDA II 2014).

The political process of developing a climate change policy framework for Ghana began in 2008, when the MESTI established the National Climate Change Committee (NCCC). One year later, in 2009, the ministry started an inofficial stakeholder consultation for the creation of a *National Climate Change Policy* (NCCP). The main outcome of this consultation was the *Ghana Goes for Green Growth* (2010) document that officially set the stage for the climate change policy process. *Ghana Goes for Green Growth* was the result of numerous meetings between academic consultants, the donor and business communities, civil society organizations, the media, traditional as well as religious leaders, and a gender group. After the document was finally released in November 2010, another series of consultations, meetings and workshops started, this time with the explicit goal to develop a national climate change policy framework under the mandate of the NCCC. The institutions and people (several thousand) who were involved in these consultations included the staff and management of the MESTI as well as other related public sector MDAs (Ministries, Departments and Agencies). Involved in the consultative process were, again, also the media, civil society groups and community-based organizations, the National House of Chiefs, the private sector and the donor community, international and faith-based organizations in Ghana, as well as academic institutions and the Ghanaian parliament. The *Ghana Goes for Green Growth* document can thus be seen as a political 'trial balloon' to initiate an inclusive public debate on the new climate policy. When the official NCCP consultation process finally came to an end, academic consultants at the University of Ghana pulled together the comments that had been made at various meetings, and issued the zero draft of the NCCP

for validation in 2012. The final version of the policy was officially launched in July 2014. It prioritizes five programme areas:

- Policy Area 1* Agriculture and Food Security
- Policy Area 2* Disaster Preparedness and Response
- Policy Area 3* Natural Resource Management
- Policy Area 4* Equitable Social Development
- Policy Area 5* Energy, Industrial and Infrastructural Development

Besides the NCCP process, efforts were also made on behalf of the government to mainstream climate change adaptation into development and disaster management plans, and to build organizational and technical capacities for the implementation of national adaptation actions. Prior to the development of the NCCP in 2006, the EPA initiated a national adaptation policy process as part of the Netherlands Climate Assistance Project (NCAP). This process resulted in the release of the *National Climate Change Adaptation Strategy* (NCCAS) in 2010. The adaptation policy process was also financially supported by the Danish government through the Climate Change and Development Programme – Adapting by Reducing Vulnerability (CC-DARE). From 2009-2010, the CC-DARE initiative was jointly implemented by the Ghanaian government, the United Nations Development Programme (UNDP) and the United Nations Environment Programme (UNEP). An official guidebook on '*integrating climate change and disaster risk into national development, policies and planning*' has been issued by CC-DARE in 2010. Government activities in the field of disaster management also include the preparation of Disaster Management Plans at the national, regional and district levels (GFDRR 2009). Moreover, in response to the United Nations recommendations under the Hyogo Framework for Action, the National Disaster Management Organization of Ghana (NADMO) established a national, and several subnational platforms for disaster risk management (DRM). These platforms are comprised of government officials, staff members of international organizations as well as representatives from academia and the private sector. Their official

mandate is to implement disaster management policies with the support of Technical Advisory Committees for the identification, monitoring and assessment of hazards. In reality, however, the institutional capacity of NADMO to forecast and monitor hazards and to provide mechanisms for preparedness, early warning and early response is limited at all levels. Especially the devastating flood events that hit the northern part of Ghana in 2007 and 2009 have revealed considerable problems with respect to the coordination of disaster management, disaster relief efforts and capacity/vulnerability assessments. Hence joint training programs were carried out by NADMO and the EPA in 2010. The goal was to build the capacity of MMDAs with regard to disaster risk reduction and the mainstreaming of climate change adaptation. This was done in the areas of budgeting, planning and designing of structural works as well as implementation. However, the findings presented in this study confirm that there are still serious challenges regarding insufficient institutional capacities for disaster risk management that warrant further attention.

In summary, the table below outlines the historical process that led to the establishment of the NCCP in 2013, and highlights the most important policy initiatives with regard of climate change adaptation and disaster risk management to date.

Table 1. Historical Outline of Adaptation Policy Processes in Ghana

1995	Ratification of the United Nations Framework Convention on Climate Change (UNFCCC)
2000	Ghana's First National Communication to the UNFCCC
2003	Netherlands Climate Assistance Programme (NCAP) Ghana – <i>Phase I and II</i> : in cooperation with the Environmental Protection Agency and the National Development Planning Commission (<i>until 2008</i>)
2008	Creation of the National Climate Change Committee by the Ministry of Environment, Science, Technology and Innovation (MESTI)
	Start of the Natural Resources and Environmental Governance (NREG) sector budget support mechanism (<i>ongoing</i>)

2008	To support the NREG process, the civil society support mechanism Kasa ("speak out" in Twi) is instituted (<i>ongoing</i>)
2009	First round of (inofficial) stakeholder consultations on climate change policy initiated by the MESTI; strong involvement of the University of Ghana in the consultation process
	Joint initiative by UNEP, UNDP and the Danish Government in cooperation with the EPA: Climate Change and Development – Adapting by Reducing Vulnerability (CC-DARE) (<i>until 2010</i>)
2010	CARE International Ghana starts implementing the Adaptation Learning Programme for Africa (ALP) in cooperation with local civil society partners and government institutions. The programme is financially supported by the UK, Finland, Austria, and Denmark (<i>ongoing</i>)
	UNDP Ghana starts implementing the Africa Adaptation Programme (AAP): "Developing capacity and financing options for mainstreaming climate change adaptation in Ghana, with a focus on early-warning systems" (<i>until 2012</i>)
	National Climate Change Committee is officially mandated to initiate a process for the development of a National Climate Change Policy (NCCP)
	Finalization of the "Ghana goes for Green Growth" document as a basis for further debate
	Second round of stakeholder consultations for the development of the NCCP
	Final version of the National Climate Change Adaptation Strategy (NCCAS) released by CC-DARE and the EPA
	Official Guidebook on Integrating Climate Change and Disaster Risk Reduction into National Development, Policies and Planning in Ghana released by CC-DARE, the EPA, the NDPC and NADMO
2011	Ghana's Second National Communication to the UNFCCC
2012	Circulation of the NCCP (Zero Draft) for finalization and subsequent ratification by the parliament
2013	Completion of the NCCP document

With the release of the NCCP and in light of the high-level political support it received, Ghana has now made considerable headway in promoting adaptation domestically. However, it is still questionable whether the political momentum that has been generated through the release of the NCCP in 2014 can be sustained in the long term. For the NCCP to become more than an act of symbolic politics requires strong political leadership and enabling institutional structures for decentralized implementation efforts in the five main policy areas. However, it is precisely in this area where policy analysts have so far painted a rather unflattering picture. Cameron (2011, p. 22), for instance, refers to adaptation policy in Ghana as an "externally driven agenda" that lacks real political ownership. Conversely, Sarpong and Anyidoho (2012, p. 9) perceive this external influence as the result of low research capacity, especially

related to adaptation strategies, because domestic climate change actors (...) do not have the expertise and funds or (in the case of the government, the commitment) to produce relevant and usable knowledge.

Thus, the crucial question that needs to be raised is whether the release of the NCCP will change these dynamics and facilitate the local implementation of adaptation actions. At least with regard to the provision of 'relevant and usable knowledge' such an assumption would certainly be premature, as the NCCP merely provides a broad summary of existing scientific knowledge and is meant to serve as a roadmap for policy coordination in the five main policy areas. However, the implementation of particular adaptation actions requires highly specialized knowledge as well as technical coordination and expertise at the sub-national level. As I will illustrate in this study, there are still reasons for concern in both of these areas. With respect to political will and agenda ownership, the overall picture is rather mixed as well. At the level of national party politics there is still an observable lack of political determination and domestic pressure from constituencies to take climate change issues more seriously. So far, the NCCC has not been

able to champion climate change publicly, and to serve as a policy hub for climate change-related issues in Ghana.

Overall, the reasons for this political neglect of climate change adaptation are likely to be found in the dynamics of the international climate negotiations. There is a clear sense of political disillusionment among African negotiators concerning the UNFCCC mantra of 'common but differentiated responsibilities and respective capabilities' (Article 3). Considering the scale of the challenge ahead, it is evident that decisive climate change action requires adequate financing and that adaptation will be costly.

However, most African countries, including Ghana, have thus far contributed very little to causing climate change, and yet they have to bear the brunt of the burden. As a result, there have been repeated attempts by African policy makers and activists to push industrialized countries to honor their commitments under the UNFCCC, financial and otherwise. This means holding industrialized countries accountable for capitalizing funding schemes that have thus far remained largely underfunded, for example the Least-Developed Countries Fund, the Adaptation Fund, and to some extent, the Green Climate Fund as well.

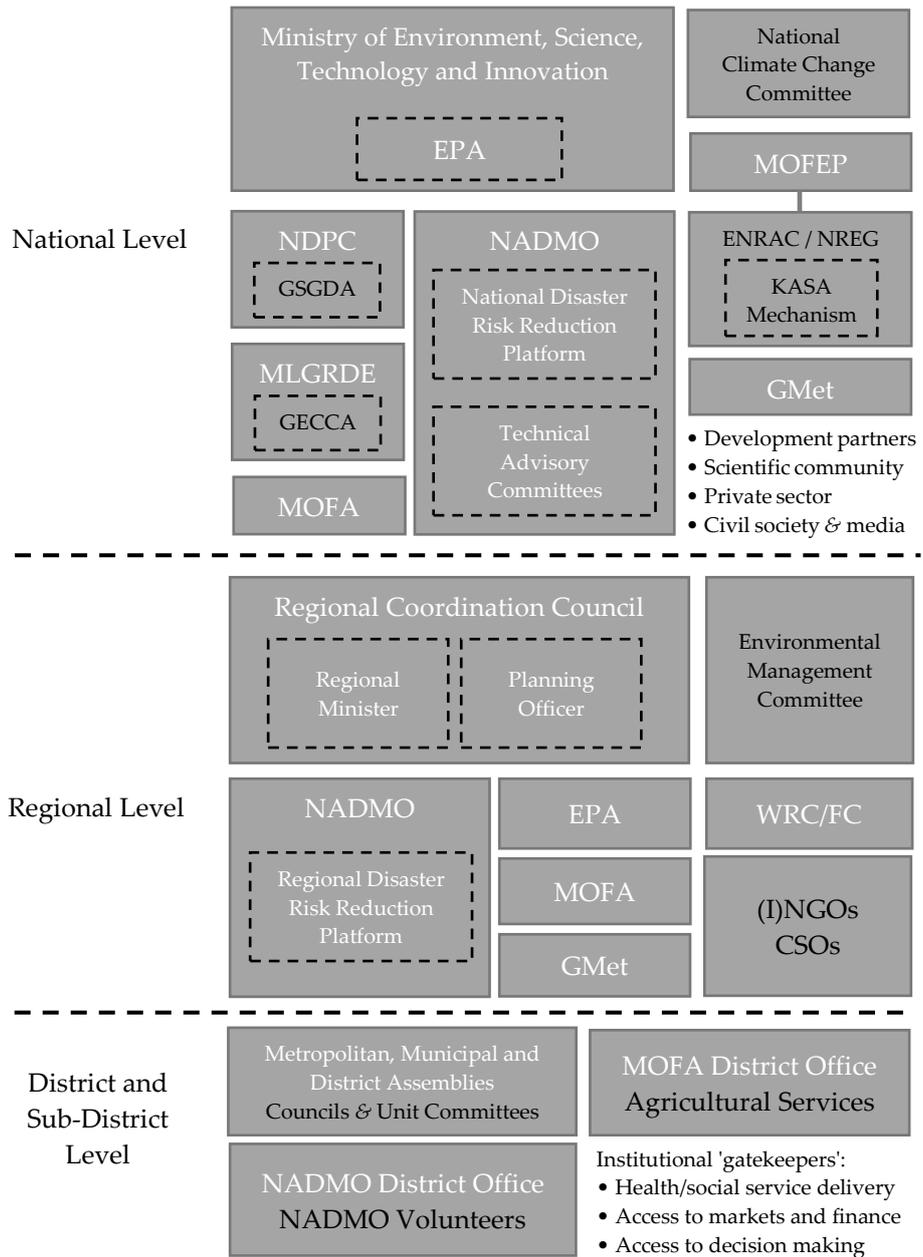
Overall, the release of much-needed adaptation money is slow, domestic absorption capacities in Africa are generally low, and available adaptation funds are pathetically insufficient to meet the complex challenges faced by African countries. This situation has led to considerable irritations among African policy makers about arduous international reporting tasks as well as restrictive accreditation and eligibility criteria (Afful-Koomson 2015, p. 375). Within the Ghanaian administration, it has supposedly even prompted remarks about "mirage money" (Cameron 2011, p. 9). Following this line of thought, it is intuitive to assume that symptoms such as the lack of political ownership, the slow pace of implementation, and the dominance of international donors in the field of adaptation policy are directly related to funding concerns. Paradoxically, however, it has been demonstrated that pro-

longed inaction on climate change will result in even greater adaptation costs in the foreseeable future (UNEP 2013, p. 32). Yet public pressure to act on climate change adaptation and mitigation is gradually rising in Ghana due to the establishment of the so-called 'Kasa' civil society support mechanism under the umbrella of NREG in 2008, and as a result of the increased coverage of climate-related issues in the national news media. Knowledge networks such as the Ghana Climate Adaptation Network (G-CAN) and the Sustainable Forestry Management Partners of Ghana also contribute to the public agenda-setting process, for instance by acting as knowledge brokers between smaller and more locally oriented civil society organizations and the state administration. Another important role in the public agenda-setting process can be attributed to faith-based organizations and customary authorities. Golo and Yaro (2013, p. 282) remark that religious leadership is crucial for the implementation of environmental policy in a "devoutly religious" country such as Ghana.

Participatory research in the context of civil society stakeholder meetings prior to the establishment of the NCCP also confirms that – in addition to academic consultants – donor organizations and development agencies such as the World Bank, the United Nations as well as CARE International Ghana and Friends of the Earth exert significant political influence in the newly emerging Ghanaian *adaptation arena*, particularly with regard to the agenda-setting process at the national level of policy making.

As a starting point for further analysis, the diagram below presents an overview of the organizational architecture of climate change adaptation and disaster risk management in Ghana (Figure 1). Based on information gathered from field research and multiple stakeholder interviews that took place from July 2012 until April 2013, it depicts a selection of institutions that shape human adaptiveness and are deemed to be particularly relevant for the implementation of adaptation actions and possible future NAPAs (*National Adaptation Programmes of Action*) under the umbrella of the UNFCCC.

Figure 2. Organizational Architecture of Climate Change Adaptation and Disaster Risk Reduction in Ghana



Climate Change Adaptation as Adjustment, Reform and Transformation

In his seminal work on the economics of climate change, Sir Nicholas Stern writes: "Over the next thirty years, substantial climate change is already inevitable, since mitigation will have only a minor effect on stocks of greenhouse gases in this time frame" (Stern 2006, p. 6). In line with this argument, the concept of climate change adaptation is based on the recognition that societies will have to respond to the inevitable outcomes of anthropogenic climate change, no matter how efficient mitigation attempts may be. The inevitability of adaptation is also reiterated in the Fifth Assessment Report of the IPCC's Working Group II, which concludes that "[h]uman and natural systems have a capacity to cope with adverse circumstances but, with continuing climate change, adaptation will be needed to maintain this capacity" (IPCC 2014b, p. 838). Given the fact that the adverse effects of climate change are already tangible in Ghana, and considering that the negative impacts on water availability, public health and agricultural production are predicted to increase in the coming decades, there is little doubt that additional adaptation efforts will be required if current development goals are not to be jeopardized (IPCC 2014b, p. 75). The following sections in this introductory chapter will therefore engage with the scientific repercussions of these very practical challenges. The overall aim is to closely review the main ideas behind academic debates in social science-related research on adaptation, and to clearly explain important analytical concepts that revolve around the crucial questions of 'how' 'we' should adapt, and 'to what' exactly.

Initially, a case can be made for the fact that humankind has been adapting to a changing climate since the dawn of the species. Similarly, it can be emphasized that a wealth of cultural knowledge(s) about incremental adaptations exists locally, and that this extensive body of indigenous, local, and traditional wisdom must be considered "a major

resource for adapting to climate change" (IPCC 2014b, p. 87). What is novel about the problem of anthropogenic climate change, however, is that current and expected changes in climatic conditions are the direct result of human interference with the biosphere, and that these changes coalesce with unequally distributed social risks such as poverty and persistent social inequalities. In other words, it is precisely the unprecedented combination of social and ecological factors that leads to a situation in which the adaptiveness of particular groups, individuals and societies is frequently exceeded. This means that the many hardships people face due to particular extreme events such as prolonged dry spells or erratic rainfall are never exclusively attributable to biogeochemical processes. They result from a complex interplay of cultural, social, political, economic and technological factors that make individuals and *complex social-ecological systems* (SES) particularly susceptible to multiple stressors. Thus, given the substantive overlap in recent debates about climate change adaptation and sustainable development, it is neither possible nor desirable to clearly separate the related discourses (see Ayers and Dodman 2010).

Furthermore, it is clear that synergies between adaptation and development policies are not automatically realized, and that further integrative efforts are required. In practice, adaptation is closely connected to institutional processes in the areas of disaster risk management, agricultural policy and natural resource management, while, simultaneously, adaptation has become a relevant topic for coastal protection, energy production, as well as public health and social protection. This interdisciplinary outlook of adaptation as a relatively new field of research and a cross-cutting policy domain is increasingly reflected in the social science-related literature. Climate change adaptation is now a fast-growing research domain that connects scholars with an interest in, for example, development studies, geography, sociology, anthropology, sustainability science, (political) ecology, risk and hazards research as well as urban planning, environmental law, cultural studies, and economics. However, research on climate change adaptation is not

only a complex endeavor because of the interdisciplinary nature of the problems at hand. It is also exceedingly challenging due to the fact that climate change itself can be characterized as a *wicked problem*. The term "wicked problem" was popularized by Rittel and Webber (1973) and has been applied to describe complex interactions in coupled SES (Fitz-Gibbon and Mensah 2012, p. 2). Broadly speaking, wicked problems defy resolution because they are "ill-formulated, involve uncertainty as well as confusing information (...) and promise ramifications for the whole system" (or society) under investigation (Ferkany and Whyte 2012, p. 421). Wicked problems are moreover characterized by enormous circularities, interdependencies and conflicting norms, values, and stakeholder interests (Lazarus 2009, p. 1160). As a consequence, wicked problems cannot simply be defined and solved in sequential steps by different groups of specialists. Instead, each attempt to address a particular subset of the overall problem complex may result in cascading effects, new uncertainties, or failures. In the context of anthropogenic climate change, Levin *et al.* (2012) have gone one step further and suggested to define climate change as a "super wicked" problem. Super wicked problems display the same features as wicked problems, although they are characterized by four additional challenges: (1) time is running out, (2) those who cause the problem also seek to provide a solution, (3) the central authority needed to address the problem is weak or non-existent, and (4) policy responses discount the future irrationally (Levin *et al.* 2012). This characterization of super wicked problems also closely matches the features of so-called *post-normal science*, where "facts are uncertain, values in dispute, stakes high and decisions urgent" (Funtowicz and Ravetz 1993, p. 86).

In the beginning of the twenty-first century, post-normal or super wicked problems often result from human interferences with the planet's ecosystems, and forcefully converge with the challenges posed by multidimensional inequalities and vulnerabilities. In the wake of the global "risk society" (Beck 2009), and due to the simultane-

ous occurrence of multiple interdependent crises, a new type of language has entered academic debates. Discourses about *risk* have now engrossed our collective imagination against the backdrop of an advanced modernity that, through its own successes in the fields of science and technology, has created largely unprecedented threats (WBGU 2011, World Economic Forum 2012, University of Oslo 2013, IPCC 2014b). Ulrich Beck comments:

A core contradiction in contemporary society is the fact that advanced modernity, with the aid of its scientific instruments and its mass mediated communication, is forced to accord highest priority to the mega-threats it itself has generated, although it is clear that it lacks the necessary concepts to observe or impute, let alone "manage", them adequately – at any rate, not as long as the institutional status quo is absolutized and held constant in an ahistorical manner (Beck 2009, p. 8).

The fragile equilibrium of current world affairs is therefore increasingly characterized by cultural-cognitive hybridity. Global politics has moved, as the late James Rosenau famously put it, beyond the disenchanting impetus of "late" or "post" modernity into an emergent epoch of *framgregation* (Rosenau 2003, p. 11). Although framgregation may sound cumbersome as an analytical term, it aptly describes the simultaneous dynamics of globalization, centralization and integration on the one hand, and localization, decentralization and fragmentation on the other, which mark the contested political terrain of 'nature-culture' relations at the beginning of the twenty-first century.

But what comes after the bold proclamation of the *age of risk*, we may ask? And what follows after the great postmodern onslaught in the fields of social theory and philosophy, especially with regard to the necessary re-conceptualization of nature-culture relations in the face of anthropogenic environmental change?

After postmodern theory has gone to great lengths to deconstruct the shaky ideological foundations of western modernity, Enlightenment rationality, developmentalism and cultural essentialism, it seems as if social theory has once again been struck by inertia. While public debates about transformations in the face of the ecological crisis are still focused on the grand narratives of ecological modernization and techno-scientific progress, there is a tangible sense of pessimism among many critical social theorists concerning the human ability to steer or even shape the large-scale societal transformations that will be required in the face of climate change (Brooks *et al.* 2009, Jänicke 2012). In fact, grand narratives of social transformation and modernization are usually met with a profound disdain by many social theorists, as they are seen to represent a neocolonial program of *territorialization* (i.e., the transformation of territories through capitalist development) and "cultural imperialism" rooted in Western values or interests (see Said 1994, Mbembe 2003, p. 25-26).

Yet some readers may be doubtful at this point and ask why we should consider such a negative view of modernization at all when we talk about climate change adaptation in Ghana? Are the most pressing socioeconomic problems – for example poverty and a lack of infrastructural development – not the exact opposite of what is commonly considered to be modern? As James Ferguson writes in response to the claim that there exists a specifically 'African' modernity: "Many ordinary Africans might scratch their heads at such a claim. As they examine the decaying infrastructures, non-functioning institutions, and horrific poverty that surround them, they may be more likely to find their situation deplorably *non-modern*" (Ferguson 2006, p. 185). However, a cultural critique of modernization in the everyday sense of the term, namely as western-style capitalist development, is only part of what the concept of modernity implies and how it can be used analytically.

At first, let me point to the fact that amidst the 'framegrative' dynamics of modernity, there is still a concomitance of nonsynchronisms,

epitomized by the *tópos* of the *colony*. Multiple and contested modernities co-exist in a nonsynchronous fashion and continue to create new and metamorphous social spaces. In an African and, more specifically, a Ghanaian context, these hybrid cultural phenomena are often described through simplified dichotomies: deficiency vs. progress, the center vs. the periphery, and simultaneously, the modern vs. the traditional (i.e. the 'not yet modern') (see Andreasson 2005, Enwezor 2010). Contrary to these limiting dichotomies, however, Ernst Bloch (1977, p. 22) conceives of the nonsynchronous manifestations of modernity in a deeper sense when he writes: "Not all people exist in the same now."⁹

This is precisely the point where the concept of modernity can help us to better understand the hybridity and contested nature of fragmented sociocultural processes which, all too often, seem to be 'out of tune'. Today, Information and Communication Technology (ICT) is spreading even in the most remote rural areas of Ghana, while poverty continues to persist in the same places. Meanwhile, "neoliberal" globalization is gradually changing traditional institutions in the northern savanna zone, far away from the commercial centers of Accra and Kumasi (Yaro 2013b, p. 411). As 'Western' scholars working on climate change adaptation, we are therefore – perhaps more than ever – compelled to thoroughly reflect on our own *colonial gaze*.¹⁰ Is it not important, we may ask, to question our own paradigms and the ways in which the "North American and European PhD student (...) is conditioned and 'professionalized' to then be sent out in 'the field', armed with her knowledge, her theory, her method"? (Andreasson 2005, p. 983). In other words, are culturally simplistic and deficit-centered approaches to the study of climate change adaptation in the global South

⁹ In the German original, the concept of nonsynchronism translates into *die Ungleichzeitigkeit des Gleichzeitigen*.

¹⁰ The notion of the colonial gaze refers to the rationalizing, ordering view of the colonizer. The colonized space is seen as essentially 'empty', while the subjects of colonization are seen as inferior, helpless, and ready for domination (that is, if they do not gently disappear into the backdrop of 'nature') (see Nelson 2011, p. 165).

not ultimately contributing to the creation of neocolonial *subjects at risk*, mainly characterized by deficits, pathologies and vulnerabilities?

There are certainly no simple answers to these fundamental epistemological questions, since most western scientists would probably be hard-pressed to give an 'objective' (or unmediated) account of their own hybridized culture and knowledge base. However, one possible answer to this predicament of sociologists in their role as "professional strangers" (Albrecht 1991, p. 285) may be found in the following excerpt from a speech by the former German President Horst Köhler, titled "On the impossibility of speaking of Africa". In his speech, Köhler asked:

[A]re we really able to escape our Eurocentric paradigms? Our definition of Africa can only ever be partial, our interpretation of Africa can only ever be distorted, and we have no alternative but to acknowledge that our image of Africa says more about us than it does about Africa itself. (...) [T]here is an African proverb: 'Beware of the naked man who offers you clothes.' And my goodness, we Europeans are naked, with our double standards and our comfortable hypocrisy vis-à-vis our past and present contribution to Africa's problems. It is high time we regained our credibility. (...)

What I would like, therefore, is for us to acknowledge the distortion in the way the West sees things. To be shaken in our prejudices. Not to apply our own yardstick as universal measurement. To learn to understand Africa in its own context. To turn the irritation and friction that entails into a constructive force. To listen, and to listen over and over again. And: to put some clothes on (BMBF 2014, pp. 26-31).

What this reflexive speech could possibly imply is that faithfully representing a 'Ghanaian' modernity means to focus on its inclusive and exclusive currents as well as its contested nature. 'Authentic' representation to the extent possible, that is, from an openly contingent perspective, thus means to acknowledge the repercussions of the colonial past and – at the same time – reflect on the particularities of contem-

porary Ghanaian life with all its cultural diversity and its inherent contradictions of poverty and affluence. In other words, thinking of present-day Ghana without considering colonial legacies is in itself an impossibility. However, I argue that as social scientists we must nonetheless caution against the tendency to reduce our scholarly field of vision to a new, *postmodern gaze* which seeks to implicitly trace all of the existing inconsistencies in contemporary Ghanaian society back to external interventions or (neo)colonial entanglements. Even if such an approach may be justified in many (if not most) cases, it should *not* become the sole analytical lens of social scientific inquiry.

For example, the case of the Veia dam shows that detrimental outcomes of infrastructural adjustment projects cannot simply be reduced to Western neocolonialism or developmentalism. The open letter that was published by the 'Youth of Veia' in the aftermath of the tragic death of Gideon Aniah shows that the intervention *as such* was not at the heart of the dispute. Interestingly, the letter explicitly frames the intervention against the backdrop of progress and stagnation. To be precise, it accuses the local law enforcement authorities of portraying the people of Veia in a negative light, namely "as a people who are against development", while simultaneously pointing to the tendency to "satisfy individual selfish interest in the name of development" (Ghana Web 2013, n. pag.).

It can thus be said that the overall goal of socioeconomic and infrastructural improvement was not the main issue of contestation. Of far greater importance was the way in which the concept of development and notions of traditional culture had been politicized and instrumentalized during implementation. Therefore, it is an important task for research on climate change adaptation in Ghana to better understand the hierarchical nature of institutional settings in which adaptive trajectories unfold. Wise *et al.* (2014, p. 331) indirectly point to the decision-related dimension of this analytical gap by noting that

... in many cases and particularly in developed-country contexts, research and planning efforts to support adaptation have adopted approaches based on the assumption that a clearly identifiable rational decision maker exists with the mandate to make decisions.

In other words, to avoid taking risky implementation decisions in the future it needs to be explored how norms, discourses and power relations jointly contribute to the social production of risk. A good starting point from which to broach this complex question is to adopt a *descriptive* reading of climate change adaptation. Instead of simply comparing empirical results to normative benchmarks for 'successful' adaptation, it has to be considered how adaptation is defined by relevant organizations and groups. To do so, it is necessary to determine how various adaptation approaches can be classified and compared according to the underlying norms and values which govern them. At first, I will engage with this problem by introducing three heuristic categories of adaptation that are currently discussed in the interdisciplinary literature on climate change adaptation and development. Broadly speaking, these categories form the normative bedrock of contemporary thinking on what it means to 'successfully' adapt.

Overall, I distinguish between the following three categories: (1) 'adjustment' adaptation (also known as 'incremental', 'coping', 'resilience' or 'restoration'); (2) 'reformist' adaptation (also called 'transition', 'transitional' and 'more substantial' adaptation); and (3) 'transformative' or 'transformational' adaptation. I consider these categories particularly useful from an analytical perspective, since they combine a historical perspective rooted in adaptation and hazards research with recent developments in the literature on resilience and transformation (see Nelson *et al.* 2007, Craig 2010, Moser and Ekstrom 2010, Levine *et al.* 2011, Park *et al.* 2012, Pelling 2012, Bassett and Fogelman 2013, Palutikof *et al.* 2013, Vermeulen *et al.* 2013, Pelling *et al.* 2015).

However, it must be borne in mind that the three heuristic categories of adaptation only entail ideal types, and that their characteristics are by no means mutually exclusive. Put differently, their embedded concepts, discourses and practices may permeate one another, and it may not be uncommon to find traces of all three heuristic categories present in the same project intervention or policy narrative. Yet, the main value in identifying these ideal heuristic categories can be found in the explanatory force they provide in mapping normative poles and discursive standpoints that pattern debates about incremental and more substantial adaptation options, often with very real material outcomes.

Finally, an interpretive heuristic approach also presents a more systematic means of comparing diverse managerial interpretations of adaptation to more locally embedded meanings and values. In sum, the three heuristic adaptation categories will be defined as follows (for comparison, see Schulz and Siriwardane 2015):

Adjustment adaptation: So-called "adjustment adaptation" classifies climate change and biogeochemical hazards as the main source of harm and proposes different forms of iterative adjustment as a response to such threads (Bassett and Fogelman 2013, p. 49). The main goal of adjustment adaptation is to return complex SES to a normatively desirable state of *equilibrium*, and to "maintain business-as-usual development paths" under conditions of deep uncertainty (Pelling 2011, p. 140; also see Davoudi 2012, p. 301; Palutikof *et al.* 2013, p. 9). In a conservative adjustment approach, knowledge and resources are channeled downwards through policy "mainstreaming" and by means of "climate-proofing" socioeconomic development under a wide range of possible scenarios (Moore 2012, p. 39; IPCC 2014b, p. 86). Adjustment is therefore characterized by the *top-down* implementation of technological and managerial solutions guided by state administration, *experts*, or social and economic elites (Ayers 2011, p. 85; Bassett and Fogelman 2013, p. 50).

Current views of *resilience* in international development policy also lean toward the adjustment approach.¹¹ For example, Brown (2012, p. 47) points out that the resilience concept is often used in defense of the modernist development paradigm, and to promote systemic stability for business-as-usual growth models, "quite contrary to the emphasis on change" that is commonly attributed to resilience thinking.

Transformative adaptation: When invoked in its most generalized sense, transformation can, on the one hand, imply an unexpected or unintended form of change, often a crisis or regime shift, and on the other denote a pre-designed or consciously steered outcome (Nelson *et al.* 2007, O'Brien 2012). However, it must be asked what meanings the term "transformative" carries in the context of climate change adaptation. In essence, deliberate social transformations in response to climate change imply a fundamental or radical shift at the *systemic* level of complex SES (Nelson *et al.* 2007, p. 400; Levine *et al.* 2011, p. 2). Changes in agricultural and commodity production processes or behavioral changes in human-environmental relations include examples of such profound systemic alterations (Kates *et al.* 2012, Park *et al.* 2012, Vermeulen *et al.* 2013). Moreover, transformation may also encompass fundamental shifts in human interactions. This entails shifts in social norms, paradigms, values, beliefs and power relations that affect diverse forms of vulnerability and pervade socio-political, economic and technological spheres of everyday life (Driessen *et al.* 2012, IPCC 2014b). Transformation thus denotes the emergence or prevalence of collective action for progressive social change. To initiate social action for change, transformative adaptation emphasizes human agency and *intrinsic* forms of motivation, straddling value-based, emotional and cognitive realms of communicative action (see O'Brien and Wolf 2010, University of Oslo 2013, p. 18). A transformative approach therefore would embody visions of fairness, justice and social cooperation to

¹¹ For a more detailed description of the resilience concept, please refer to page 50 of this study.

push for advances in areas such as intergenerational equity, gender inclusiveness and other rights-based claims (Bee *et al.* 2013, Schlosberg 2013, Tanner *et al.* 2015). In the context of knowledge production, transformative adaptation remains embedded the spheres of *experimentation*, social entrepreneurship and innovation, together with reflexive learning (Biggs *et al.* 2010, Westley *et al.* 2011, Wise *et al.* 2014).

Reformist adaptation: The 'reformist' approach to adaptation occupies the middle ground between adjustment and transformation. The term 'transition' is often used interchangeably. Characteristically, reformist adaptation neither advocates for the political status quo nor endorses fundamental, paradigmatic, or systemic change (Pelling 2011, p. 68). On the contrary, it concentrates on *incremental* reforms in prevailing socio-political and economic systems through the iterative modification of laws, technologies, rules, and decision-making processes. Put differently, reformist adaptation may question existing rules and decision-making processes, but not the normative-cognitive principles and asymmetric power relations that govern these very rules (Pelling 2011, p. 70). The dominant normative and behavioral paradigms under which the reformist approach operates, and which are arguably not fundamentally questioned in managerial discourses about climate change, are "ecological modernization" and "sustainable development" interventions (Blühdorn 2011, p. 38; Bassett and Fogelman 2013, p. 49). The production of knowledge still functions within the normative confines of managerial governance and technical "systems thinking", although it is sought to be more *participatory*, inclusive, and geared toward adaptive learning, transition management, and the *co-production* of knowledge (see Pahl-Wostl 2009, Loorbach 2010). Yet, depending on its interpretation, the reformist approach may still possess the propensity to vitalize transformative action due to its emphasis on structural change and incremental reforms in existing governance regimes.

Table 2. Three Heuristic Categories of Climate Change Adaptation

	Adjustment	Reform	Transformation
Change	Equilibrium	Incremental	Systemic
Knowledge	Expert-led	Co-production	Experimental
Intervention	Top-down	Participatory	Intrinsic

(Schulz and Siriwardane 2015, p. 10)

Adaptation and Disaster Risk Management

Apart from different normative interpretations of what it means to 'successfully' adapt, climate change adaptation is closely linked to a variety of cross-cutting policy areas. One of the most important policy areas that intersects with climate change adaptation is disaster risk management (DRM) (see Hyogo Framework for Action 2005, IPCC 2012). As in the case of Ghana, disaster risk management strategies and policy frameworks are often well established and implemented at different administrative scales to address harmful events such as storms, droughts, floods, bushfires and disease outbreaks. It is now widely acknowledged that DRM can serve as an appropriate institutional entry point for the mainstreaming or practical implementation of adaptation actions (see Thomalla *et al.* 2006, Preston and Stafford-Smith 2009, Mercer 2010, Jones and Preston 2010). As an umbrella term, disaster risk management has been defined by the IPCC (2012, p. 3) as

processes for designing, implementing, and evaluating strategies, policies, and measures to improve the understanding of disaster risk, foster disaster risk reduction and transfer, and promote continuous

improvement in disaster preparedness, response, and recovery practices, with the explicit purpose of increasing human security, well-being, quality of life, resilience and sustainable development.

Generally speaking, climate change adaptation and DRM have many elements in common, for instance the focus on the consequences of complex socio-environmental problems, the communication between technical specialists and (potentially) affected individuals, and the need to establish institutional processes to link all of these activities (Jones and Preston 2010). The National Climate Change Adaptation Strategy of Ghana also explicitly connects adaptation and DRM at an institutional level by emphasizing the need to mainstream climate change and disaster risk reduction into national development plans (NCCAS 2010).

Moreover, climate change adaptation and DRM are directly related to the notion of *risk*. In the broadest sense, risk can be described as the likelihood of incurring harm or the probability that some type of injury and/or loss would result from a particular harmful event (Crichton 1999). A *disaster* might be such a harmful event, and is conceptualized as "a serious disruption of the functioning of a community or a society (...) which exceeds the ability of the affected community or society to cope using its own resources" (UNISDR 2009, p. 9).

With regard to the question of causality, disruptive or harmful events such as disasters are seen to be triggered by *hazards*. A hazard can be defined as "a dangerous phenomenon, substance, human activity or condition that may cause loss of life, injury or other health impacts, property damage, loss of livelihoods and services, social and economic disruption, or environmental damage." (UNISDR 2009, p. 17). In other words, a hazard is a potential threat, and not an actual event itself. Hazards may manifest in events such as disasters.

Nevertheless, the UNISDR definition limits "hazards of concern" for DRM to "hazards of natural origin and related environmental and technological hazards", thereby removing most social causes from the

analysis (UNISDR 2009, p. 17). In the following, I will therefore refrain from using the exact UNISDR terminology and focus on hazards as the *causes* of occurring harm.

Overall, it has become sufficiently clear that potential harm is not only determined by biogeochemical and technological hazards, for instance by climate change and infrastructure failures, but also by the degree of "vulnerability" and "exposure" to multiple social hazards, for example poverty (IPCC 2012, p. 69). Therefore, I will briefly discuss the concept of vulnerability in the following section.

Vulnerability and Barriers to Adaptation

Vulnerability is a commonly used concept across the natural and social sciences and is applied in various disciplines such as ecology, political science, sociology, anthropology, psychology, geography, economics, public health, hazards research, and development studies. Researchers and policy makers therefore need to operate with diverse and often contested notions of vulnerability (Füssel 2007). This conceptual diversity is also representative of the fact that vulnerability is a broadly applicable concept that can serve to address a wide range of research problems (Adger 2006, Birkmann 2006, Gallopín 2006, Janssen *et al.* 2006). Furthermore, it is evident that the conceptual diversity in vulnerability research is related to the fact that numerous possible policy responses to different types of vulnerability co-exist (O'Brien *et al.* 2007, Gaillard 2010).

In risk and hazards research, multi-dimensional notions of vulnerability have emerged since the late 1970s. Besides technical and biogeochemical factors, they also include social, physical, political, institutional, cultural-cognitive and economic aspects of vulnerability (Wisner *et al.* 1994, Birkmann 2006, Eakin and Luers 2006). Vulnerability is

therefore considered an important concept for explaining the basic *conditions* for occurring harm, regardless of the normative implications and political difficulties that are related to the exact definition of the term. In the context of climate change adaptation and disastrous events, vulnerability has been broadly defined as the degree to which a coupled SES, or some part of it, is likely to experience harm due to exposure to one or multiple hazards (Turner II 2010).

Put differently, hazards that cause vulnerability may be related to biogeochemical factors, human factors, or a combination of both. A more specific definition of vulnerability is provided by the United Nations University (UNU-EHS), which states that vulnerability is

the intrinsic and dynamic feature of an element at risk (community, region, state, infrastructure, environment etc.) that determines the expected damage/harm resulting from a given hazardous event and is often even affected by the harmful event itself. Vulnerability changes continuously over time and is driven by physical, social, economic and environmental factors (Thywissen 2006, p. 34).

In accordance with this technical definition, vulnerability is neither easily nor directly measurable. It is complex, site-specific and the parameters that determine vulnerability change over time. Vulnerability is therefore linked to the complex interplay between different hazards, scales, and SES dynamics. Furthermore, there is robust evidence and high agreement among scholars concerning the fact that vulnerability is essentially socially constructed, and that it can be seen as the outcome of failed "development" policies and processes, for example "environmental mismanagement, demographic changes, rapid and unplanned urbanization, and the scarcity of livelihood options for the poor" (IPCC 2012, p. 70).

However, the exact causal relationship between hazards and vulnerability is not always immediately obvious. For instance, we may think of poverty as a hazard that causes vulnerability in relation to another hazard, for example extreme weather events. If causality is constructed

in such a way, the severity or magnitude of poverty determines the degree of vulnerability to, say, storms and floods. Vice versa, we may also define extreme weather events as the root causes of poverty, since storms and floods often lead to the destruction of assets. In this case, it is the frequency, severity or magnitude of extreme weather events that determines vulnerability to poverty.

We must therefore conclude that the concept of vulnerability cannot be understood properly without relating it to at least one hazard, and without carefully assessing multiple possible causalities. Of course, we could also go one step further and introduce a third or fourth hazard into the equation. In this case, the situation becomes even more complex. Consider for instance a situation which Michael R. Carter (2010, n. pag.) calls the "same old story about risk": households in the periphery are experiencing recurring drought which results in widespread crop failure and causes household assets to fall below a critical threshold. Simultaneously, correlated risks are undercutting rural financial market development. Households are then caught up in a poverty trap, and are unable to recover. This dynamic over time creates ever growing numbers of food aid dependent people, and is likely to perpetuate poverty across generations.

This example still remains relatively simple, as we have not even considered individual perceptions, norms, culture, power and the wider institutional or economic landscape. It nonetheless serves to illustrate that hazards and vulnerability need to be evaluated in relation to each other. Moreover, it shows that the root causes of vulnerability are becoming more difficult to determine over time and across generations. A *multi-hazard approach* is therefore essential, for it is practically impossible to fully understand vulnerability by looking at single hazards or scales in isolation. Bearing in mind the 'what' and 'how' of adaptation, the corresponding question about the nature of vulnerability is: "Who adapts to what, how, and why?"

As we shall see throughout this study, the dichotomy between the *how* of adaptation and the *why* of vulnerability is one of the most defining conceptual relationships in adaptation research and practice.

Picture 2. Drought Impacts on Crops in Northern Ghana



Recurring drought causes uninsured harvest losses near Bolgatanga, Northern Ghana.
© Author, 2013

In sum, the reciprocal relationship between vulnerability and adaptation may be described as follows:

One [vulnerability] is focused on generation of risk and the other [adaptation] on response to it. Analytically, *adaptive capacity* is the converse of vulnerability, the ability and inability to avoid risk – they are shaped by the same factors (Ribot 2011, p. 1161; emphasis added).

Concerning the use of the term 'adaptive capacity', it is nonetheless crucial to recall its negative connotations. Gaillard (2010, p. 220) aptly summarizes these connotations by pointing out that, indeed, "highly vulnerable communities may display a large array of capacities." Yet, they may be vulnerable as a result of structural or contextual factors that are not of their own making. Consequently, I will refrain from using the term adaptive capacity, and use the more encompassing and neutral expression *adaptiveness* instead. By using the term adaptiveness, I refer to the dynamic and relational status of a system, group or person that connotes the ability (adaptiveness) or the inability (vulnerability) to avoid particular risks. In line with this relational definition, I look at adaptation as an iterative social process that aims to simultaneously reduce risk and increase the ability to avoid risk.

For the purposes of this inquiry, the notion of 'risk' will be defined as the product of *hazards, vulnerability, exposure* and *adaptation* (Table 3). This holistic conceptualization of risk avoids precisely the error of "placing the risk in the hazard" or placing risk "within the climate rather than society" (Ribot 2011, p. 1160). Furthermore, it captures the multifaceted nature of risk as well as its reciprocal relationship with vulnerability, adaptiveness and place (i.e. the exposure to hazards).

In the interdisciplinary adaptation literature, both the ability (adaptiveness) as well as the inability (vulnerability) to avoid risks are generally perceived through the lens of adaptation *barriers*.¹² When applied to an institutional context, the concept of barriers typically refers to organizational or managerial impediments, including limitations regarding technological capabilities, technology development, and technology transfer (Agrawal 2010, Olhoff 2015). Institutional barriers are broadly discussed in the context of adaptation financing and governance; organizational coordination and planning; social learning and capacity building; as well as decision making under uncertainty (for a

¹² See Adger *et al.* 2009, Amundsen *et al.* 2010, Burch 2010, Moser and Ekstrom 2010, Nielsen and Reenberg 2010, Storbjörk 2010, Jones and Boyd 2011, Sietz *et al.* 2011.

summary see Wise *et al.* 2014). Moreover, IPCC Working Group II suggests that adaptation barriers are "closely linked to cultural norms and societal values" and that the existence of barriers requires "transformational change (...) for sustainable development in a changing climate" (IPCC 2014b, p. 89).

At the same time, it has been acknowledged that adaptation barriers are partly "rooted in culture and cognition" (O'Brien 2012, p. 671). This aspect has lately been at the heart of more locally oriented risk management approaches which seek to explore how psychological, cognitive and emotional factors "lead to systematic biases in (...) appraisals of risks, self-efficacy, and the benefits and costs of action" (Granderson 2014, p. 56).

Table 3. Key Theoretical Concepts

Risk	The likelihood of occurring harm or a damage potential (the product of <i>hazards, vulnerability, exposure and adaptation</i>)
Hazard	The cause of occurring harm
Vulnerability	The degree (severity, frequency or magnitude) to which an element at risk is likely to experience harm due to one or multiple hazards
Exposure	Denotes whether a territory is exposed to one or multiple hazards, whereby to be exposed does not mean to be vulnerable
Adaptation	An iterative social process that aims to simultaneously reduce risk and increase the ability to avoid risk (<i>adaptiveness</i>). Adaptation can be reactive or proactive and may be construed as adjustment, reform or transformation

Adaptation IPCC definition	Adjustment in natural or human systems in response to actual or expected climatic stimuli or their effects, which moderates harm or exploits beneficial opportunities
Barriers	Factors that decrease adaptiveness and the individual or collective ability to avoid risk
Disaster	A harmful, large-scale event that is socially disruptive and overwhelms adaptiveness
Resilience	An ideal state of current or future adaptiveness

Lastly, this introductory section would not be complete without taking into account the concept of *resilience*. In ecology, the idea of resilience has been developed by C.S. Holling in the early 1970s as a theory of complex adaptive systems (see Holling 1973). At its most basic level, resilience is rooted in the notion that humans depend on ecological systems for their survival and continuously influence the ecosystems in which they live from the local to global scale. When compared to research on climate change adaptation, resilience thinking nevertheless implies a slightly different analytical focus. Although definitions may vary across disciplines, resilience thinking is mainly concerned with ecosystem management and service provision, as well as large-scale interactions in coupled SES (Turner II 2010). What renders resilience thinking less suitable for application in the social sciences is its inherent indifference concerning questions of agency, power and conflict (Olsson *et al.* 2015). Among other things, resilience thinking has been regarded as "technocratic and managerialist" (Brown 2012, p. 47), "contested" (Tanner *et al.* 2015, p. 23), "depoliticized" (Cannon and Müller-Mahn 2010, p. 626) and insufficient in its current form to address the challenges of deliberate social transformations.

For the purposes of this study, resilience will therefore be understood as an ideal state of current or future adaptiveness, and not be used as an explicit analytical lens.

This conceptual preference does not imply, however, that research on climate change adaptation has been exempt from scholarly critique (see Ribot 2011, O'Brien 2012). Especially the concept of *community-based adaptation* (CBA) has been the focus of various criticisms since it has been first introduced into the adaptation policy debate in 2006 (Girot *et al.* 2012, p. 7). Broadly speaking, the focus of CBA activities rests on the local linkages between adaptation, development and disaster risk reduction. The main idea that underpins notions of CBA is that local communities should take the lead in transforming adaptation barriers that reproduce vulnerability and poverty.

However, what has been repeatedly pointed out by scholars is the fact that mainstream CBA projects tend to rely on stereotypical development "buzzwords and fuzzwords" such as community participation, rights-based approaches and empowerment, all of which have come under increased scrutiny for their narrow application, homogenizing tendencies as well as their apolitical and neoliberal overtones of individualized responsibility (for a comprehensive overview, see Cornwall and Eade 2010).

In view of these recurring criticisms, some of which even date back to the 1970s (see Bassett and Fogelman 2013, p. 43), it seems warranted to carefully consider the implications for adaptation research and practice. After all, it has to be kept in mind that such scorching criticisms hardly exist in a political vacuum. In fact, they are closely linked to broader debates about the "post-political" condition and depoliticized nature of contemporary climate change governance (see, for example, Swyngedouw 2010, Blühdorn 2011).

The Adaptation Concept and its Critique

The state machinery has policies, but no politics. (Ferguson 1990, p. 66)

By failing to acknowledge the political and governance context, much thinking about adaptation policy in Africa is unrealistic, and much donor activity is likely to have little effect. (Lockwood, 2013, p. 647)

Processes of depoliticization have been studied for several decades by political scientists, sociologists and development scholars (see Haines 1979, Ferguson 1990, Kenis and Lievens 2014). Views on the normative connotations and societal root causes of depoliticization differ profoundly, although the concept is occasionally portrayed in a rather positive way in public policy debates (Flinders and Wood 2014). Depoliticization is then understood as an instrument for consensus-building in exceedingly politicized public arenas, or as a shield against radical populism, nationalism, and short-term political interference motivated by vested interests (Fawcett and Marsh 2014). Nevertheless, it must be acknowledged that depoliticization is cast in an overwhelmingly negative light in recent debates on environmental politics.

In order to outline the possible negative impacts of depoliticization, I will first return to the three categories of adjustment, reformist and transformative adaptation that I have introduced earlier on. These heuristic categories can be applied to illustrate how different causal explanations of risk and vulnerability are used in theory and practice. For example, in their analysis of "the climate change concept in the adaptation literature" Bassett and Fogelman (2013, p. 50) demonstrate that there is an observable tendency in the reports of the IPCC and four major climate change journals to conceptualize adaptation as "adjustment to climate stimuli" and to identify biogeochemical hazards as the main source of risk and vulnerability.

Out of the 558 articles that were surveyed by the authors, 70 percent fell into the "adjustment" category, 27 percent were identified as "reformist", and only 3 percent qualified as "transformative" (Bassett and Fogelman 2013, p. 50). Arguably, this normative bias still affects adaptation policy and practice, since international donor agencies continue to focus their adaptation efforts on infrastructural adjustment and "what might be termed the more 'manageable' manifestations of climate change, namely, changes in seasonal and inter-annual variability (for example, in rainfall), and in the frequency and severity of extremes such as droughts, storms and floods" (Brooks *et al.* 2009, p. 752). In comparison, less attention is given to asymmetric power relations and the wider sociocultural and political context of adaptation – at least beyond the narrow scope of managerial governance arrangements.

The introductory case study has underscored the dangers that such a narrow analytical approach might pose for implementation. Unfortunately, however, the Veja case is not an exception. Drawing on evidence from the Kenyan drylands, Eriksen and Lind (2009) illustrate how adaptation interventions can in fact exacerbate human vulnerability to climatic phenomena if existing imbalances in the distribution of power and resources are not taken into account. The authors conclude that a critical assessment of vested interests and asymmetric power relations is a necessary prerequisite for the socially equitable implementation of adaptation measures. These findings are also in line with recent case studies investigating adaptation interventions in Brazil, Ghana, Mozambique, the United States, and Nepal (Nelson and Finan 2009, Venot *et al.* 2011, Artur and Hilhorst 2012, McEvoy and Wilder 2012, Coirolo and Rahman 2014).

This means that, as a result of apolitical approaches which tend to downplay the wider sociopolitical repercussions of environmental change, notions of adaptation and resilience are in danger of becoming mere technocratic concepts, driven by the *naturalization of risk* and, therefore, the depoliticization of human-nature relationships.

Naturalizing risk means succumbing to environmental determinism by adopting an analytical perspective which (1) emphasizes responses to *environmental* phenomena and thus diverts attention from the *social* root causes of vulnerability and anthropogenic climate change, (2) *individualizes* responsibility by explaining vulnerability as the result of indeterminate systemic processes or irresistible fate, and (3) *depoliticizes* adaptation by assuming that SES are governed by clearly identifiable, benevolent and neutral institutions (Bassett and Fogelman 2013, p. 50; also see Ribot 2011, Wise *et al.* 2014).

According to Swyngedouw (2010, p. 227), such an apolitical and narrow managerial interpretation of environmental issues is politically enforced and discursively justified by a "regime of environmental governance that revolves around consensus, agreement, participatory negotiation of different interests and technocratic expert management." In a similar fashion, Stephan *et al.* (2014, p. 70) perceive the depoliticizing effects of the international environmental governance regime to be rooted in "counter-strategies which seek to conceal the contingency of reality, sew the gaps in hegemonic discourses and channel dislocations in such a way that fundamental social structures remain untouched."

As political ecologists have repeatedly argued, studying the depoliticization of climate change adaptation thus implies to carefully assess the political implications of nature-culture relations, and to focus on the multiple ways in which "ecological phenomena are 'socialized' and social phenomena 'ecologized'" (Fairhead and Leach 1996, p. 8). However, there is an ongoing debate among social theorists as to whether depoliticization is actually the result of a conscious and ideologically motivated "policy of depoliticization" (Bourdieu 2002, p. 31) or a mere symptom of the exact opposite trend, the postmodern "end of ideology" that gives rise to a pragmatic managerial paradigm among decision makers, and thus leads to a "functional dissociation of ideology and practical politics" (Himmelstrand 1962, p. 89).

Leaving further details aside, what follows from this paradoxical situation is a question of almost ontological quality. How can social structures be deliberately transformed to avoid dangerous climate change, while operating within the confines of the same ideological paradigms and normative reference systems that have produced these problems in the first place? Can we, as a popular saying goes, drive out the devil with Beelzebub? Certainly, there are no silver bullets and easy-to-implement solutions for these major political challenges and deep-seated institutional gridlocks. It has been suggested, however, that "a new science on deliberate transformation is needed to both complement and supplement current research on adaptation" (O'Brien 2012, p. 668).

In light of the strong political implications of social transformations under climate change, it is nonetheless remarkable that political scientists have thus far been "largely absent" from the interdisciplinary adaptation debate (Javeline 2014, p. 421). This staggering lack of engagement is perplexing, given that the institutional school of thought in political science has much to say about the deeper normative and structural aspects of systemic transformations.

One possible reason for this notable absence and/or disinterest of political scientists may be found in the managerial, state-centric and legalistic outlook of institutional thinking, which has made it notoriously difficult to engage in interdisciplinary exchanges with less structurally inclined fields of research. However, while earlier theoretical debates in institutional theory have been mired by endless conceptual quibbles, there is now a strong tendency to reconcile different branches of institutional analysis and examine three 'modes of constraint' which shape human behavior. These modes are defined as rules, narratives, and practices (Lowndes and Roberts 2013, p. 200). What is particularly interesting in this regard is the fact that institutional theory does not simply look at these constraints in isolation, but focuses on how they

interact with each other to establish dynamic power relations and mediate new *governmentalities*.¹³

Another interesting aspect of institutional theory is the prominent role that is given to norms and normativity. Institutions, from a normative perspective, may "confirm dominant world views, uphold existing relations of authority and channel routinized everyday actions to reproduce inequalities" (Cleaver 2012, p. 85). In other words, adaptation is not merely a response to changing climatic conditions as the environmentally deterministic reading of the concept suggests. It is also a direct response to normative and political discourses that are translated into particular social contexts. For instance, policy *mainstreaming* is not as straightforward as it may seem, especially in the long term, as it requires ownership and the interpretation of an externally devised political agenda by a wide range of political actors. This leaves considerable room for interpretation as to what exactly should be mainstreamed at different levels if the umbrella term of adaptation is invoked. Furthermore, it is evident that the translation of the international adaptation agenda does not simply take place at the official level of policy making, but also at the level of local implementation. Focusing on organizational structures of the state administration while ignoring the agency of local institutional systems and individual actors would be a grave

¹³ The term *governmentality* is mainly associated with the writings of Michel Foucault. In its broadest sense, the term is used to denote discursive and social practices that result in the *normalization* of social identities and behaviors (*conducts*), through the enactment of governmental techniques. Governmentality therefore describes deep-seated material and socio-cognitive influences of governing power. Auditing, surveillance, monitoring and the co-production of socially engrained narratives about 'empowerment', 'duty' and 'freedom of choice' are seen as dominant tropes that produce a pervasive mentality of self-regulation among the public. A diversity of literature on 'neoliberal rationalities' and sustainable development therefore draws on governmentality as a concept that patterns civic discipline, compliance and consensus. However, research in the field has also been critiqued for hindering "productive conversations across the academic/practitioner divide", and for insufficiently addressing "how new governmentalities were mediated and translated by state actors, or how they were refused, inhabited or reworked by those they summoned" (Newman 2013, p. 19).

mistake. Especially in circumstances where multiple layers of customary and bureaucratic institutions co-exist, as it is the case in Ghana, people naturally turn to those institutions that are most likely to cater to their interests. Without necessarily implying an instrumental rationality, this phenomenon of "forum shopping" (Benda-Beckmann 1981) means that new organizational and regulative structures are frequently diverted from their intended use and renegotiated in local power sharing arrangements. Similar processes of creative politicking are also behind the logic of institutional *bricolage*. The notion of bricolage refers to a situation in which people "draw on existing formulae (styles of thinking, models of cause and effect, social norms, and sanctioned social roles and relationships) to patch or piece together institutions in response to changing situations" (Cleaver 2012, p. 45). The often transient institutional arrangements which are set up by donor-funded projects are likely to further reinforce these converging tendencies. As soon as new institutional arrangements are introduced, for example in the form of development initiatives, management committees or marketing schemes, they are naturalized into existing social orders and often diverted from their intended purpose through subliminal relations of power (De Sardan 2008; 2009, also see Eguavoen 2008 for an example from the Ghanaian water sector).

Thus, Lockwood (2013, p. 648) warns that even a "large increase in climate finance may have a perverse effect" as long as institutional reforms are neglected in business-as-usual scenarios. Such business-as-usual approach, he argues, would sustain "political systems that undermine the capacity of states to build adaptive capacity" (Lockwood 2013, p. 648). Consequently, it may not be realistic (or even desirable) to consider win-win situations as the only possible outcome of transformative processes. Alan Atkisson (2010, p. 215) concedes

When systems change – even in ways that you think are clearly positive – some people may experience a gain and others experience a loss: 'win-win solutions' are something of a rarity in the real world. And people do not like to lose.

Seen through the lens of political realism, the current state of affairs thus requires scholars with an interest in transformative adaptation to seriously engage with communication issues and the widening "science-policy gap" (Moser 2010). It needs to be clearly communicated that research on transformation and institutional power effects does not automatically equal unproductive finger pointing or political blame shifting. Similarly, it must be clear that transformative adaptation is neither a purely academic concept, nor simply a paternalizing criminalization of Africa, cloaked in discussions about new structural transformations and good governance principles. What the transformative approach aims to do, instead, is adding an important explanatory layer to the relatively narrow debate on the politics of adaptation, inasmuch as it helps to refocus attention on the people who are directly affected by climate change, and the very institutions, discourses and normative paradigms that contribute to the current *politics of unsustainability*. What the term "politics of unsustainability" suggests, quite simply, is to redirect our analytical focus to the structures and "socio-cultural norms underpinning all ecopolitics" (Blühdorn 2011, p. 34).

However, perceiving obstacles to structural change as being produced by an "anti-development" mindset, as Lockwood (2013, p. 656) argues, may not be entirely helpful in this regard. Not only does such an explanation ignore decades of research in postcolonial studies and post-development theory that have profoundly challenged dominant modernist and developmentalist paradigms. It also implies that clientelism and rent-seeking behavior may be attributable to a specifically 'African' mentality. Accepting this flawed idea of social reality means to advance an apolitical understanding of adaptation by neglecting the effects of colonial legacies, globalized markets, policy failures and intra-communal power relations, and ultimately, by putting the blame on culture and individuals. However, such a sweeping generalization of culture should be taken with a pinch of salt, bearing in mind that the "traditional" cultural institution of modern Ghanaian chieftaincy, for

example, is actually an artifact of colonial rule (see Lentz 2013, p. 176).¹⁴ Yet, criticizing culturalist clichés about so-called "traditional" institutions does not necessarily mean to discard the fact that in some cases specific cultural practices are *indeed* sustaining patronage politics and elite capture, as Yaro (2013b) demonstrates for the case of northern Ghana. Consequently, it is of vital importance to carefully consider what is actually implied when notions of culture, mentality and tradition are invoked in a political and scientific context.

Another important implication of these findings is to address unequal power relations in a constructive and more precise manner, and to explore what it could mean to 'bring the political back' into the study of adaptive processes. After all, this is a task that political science should be uniquely equipped to perform. Thus, building on earlier work that has examined the links between power and adaptation, I will maintain a strong emphasis on institutional dynamics, while focusing more clearly on the normative aspects and discursive formulation of risk and vulnerability.

The Social Construction of Risk: Whiter Territorialization?

Thus far, I have presented the natural science background for research on climate change and increased variability in Ghana. In this context, I have demonstrated that strong evidence points to the fact that climate change is already a reality in Ghana, and that adaptation will be an inevitable process if the foundations for human well-being are not to be jeopardized. I have also argued that several uncertainties about the future scale and impact of climate change in Ghana persist, and that a

¹⁴ Here, I refer to the institution of administrative chieftaincy, which emerged during the colonial era. "Administrative chieftaincy" adopted the symbols of the heterogeneous political structures of the pre-colonial era to legitimize its role as an agent of the colonial state (De Sardan 2009, p. 10-11). Nevertheless, despite existing criticisms, contemporary Ghanaian chieftaincy is still a popular institution and an essential part of Ghanaian heritage and culture.

simplistic relationship between environmental factors and human vulnerability should not be assumed. Subsequently, I have presented a brief history of adaptation policy in Ghana and introduced the most influential political actors and organizations which shape the newly emerging adaptation 'arena' in the country. I have also outlined key debates and concepts in the fields of adaptation, DRM and vulnerability research. By relating these strands of research to each other in a systematic manner, I have identified several analytical gaps and shortcomings that require further scholarly attention.

First, the gap analysis reveals that an engagement with the conditions of advanced modernity is essential to avoid a reification of the 'colonial gaze' and a simplistic understanding of the dynamic institutional landscape in which human adaptation and development take shape. Second, I have argued that the social conditions of advanced modernity are best explained by converging processes of *framegration* and hybridization. Generally speaking, the idea of *framegration* connotes simultaneous and interrelated processes of fragmentation and integration, for example cultural, economic, technological, political, spatial and temporal. Taken together, these interrelated processes define a political shift from a primarily state-centric model of sovereign power to more dispersed forms of decentralized and networked politics or "governance" (see Rosenau 2003). Eventually, the concept of *framegration* also closely mirrors the inherent contradictions, ambiguities, complexities, and uncertainties that post-normal science needs to account for in the face of climate change.

The notion of *hybridity*, by contrast, alludes to the fact that clear-cut distinctions between the pure realm of 'primordial' nature and the social sphere need to be fundamentally reconsidered from an ontological as well as an epistemological perspective. Or, to put it more simply, "the history of society-nature mixing is much more dynamic and expansive than we previously thought" (Rudy and White 2014, p. 129; also see White and Wilbert 2009). Under these circumstances, it is clear that essentialist ideas about fixed and place-bound cultures as well as

simplistic dichotomies between the 'traditional' and the 'modern' are impossible to uphold. Exploring processes of hybridization, I argue, warrants new forms of theoretical thinking that go beyond the simple statement that there has always been a "trend to blend" various cultures, the social and the natural, the natural and the technological, and so forth (Kraidy 2005, p. 75).

Therefore, in order to turn the notion of hybridity into a descriptive-analytical concept that can be used to examine adaptive processes, I suggest to understand hybridization as being driven by broader processes of *territorialization*. Territorialization refers to the transformation of territories through processes of social signification on the one hand, and concrete material and technological appropriation on the other (Rebotier 2012).¹⁵ This means that social territories are shaped by the way we speak about them, for instance in terms of property rights or place-based 'riskiness', while territories are simultaneously constructed through processes of material appropriation, for example through cultivation, demarcation, physical infrastructure, etc.

These concurrent processes of social signification and material appropriation ultimately converge in the *institutional organization of territoriality*. Institutions like the state and/or other authorities define territories in both material and signifiatory terms, for example by simultaneously claiming a land title and fencing off a particular piece of land, or by regulating digital flows of capital which produce tangible material outcomes. This differentiated view helps maintaining a strong focus on place that is required for field-based research, while pointing to the fact that the institutional organization of territoriality is at the same time defined and mediated by hybrid forms of social signification and materiality that transcend time and place.

¹⁵ The term social signification refers to cultural-cognitive, normative and discursive frames of meaning-making in a social context.

Assuming that unmediated or 'natural' risk does not exist, and that adaptation and risk are significantly shaped by the institutional organization of territoriality, three major theoretical questions will demand further attention. It needs to be systematically assessed how (1) dominant policy discourses shape risk perceptions and interventions; how (2) power relations influence adaptive processes across scales; and how (3) norms, discourses and power relations jointly contribute to the production of *subjects at risk*.

The first analytical challenge that follows from the above questions is to identify strands in institutional theory that can be applied to explore the 'messy' institutional organization of territoriality in everyday life. In particular, this means to develop a theoretical approach to institutional analysis that is able to account for the hybrid relationships between cultural-cognitive, normative and discursive frames of meaning-making (i.e. processes of social signification) on the one hand, and the concrete materiality of landscapes and resource flows (i.e. environmental, financial, technological and infrastructural factors) on the other. The second analytical challenge is that current epistemological and ontological assumptions about human-nature relationships will have to be significantly reworked in the face of anthropogenic environmental change (see Hulme 2009, O'Brien 2012, Weisser *et al.* 2014).

However, as it has been previously argued that perceptions, values and norms are not essential categories, because "social standards of acceptability are shifting over time", and that adaptation and ecopolitics cannot (or, ironically, ought not) be "normative" (Rebotier 2010, p. 6; Kenis and Lievens 2014, p. 533), further conceptual clarifications are needed.

In the following chapter, I will therefore explain in greater detail why I am convinced that a novel definition of normative sociology is an ontological and epistemological necessity and, indeed, a prerequisite to explore the social production of risk.

CHAPTER TWO: THEORIES & METHODS OF INSTITUTIONAL ANALYSIS

The overall aim of this chapter is to engage with current theories of institutional analysis, discourse analysis and power to render them suitable for application in the context of a multi-hazard risk assessment. The chapter is broadly structured into five sections. Section one identifies strands of social theory that are particularly conducive to exploring how institutions mediate adaptive processes. Section two engages with questions of power and normativity through an ethical and philosophical lens to better understand how power relations shape adaptive processes. The third section summarizes three analytical concepts of power that are well-suited to reconcile diverse taxonomies in institutional and discourse analysis. The fourth section, then, embeds the institutional question in a concrete assessment context by drawing on the notion of *institutional adaptation pathways*. Section five summarizes the theoretical findings and presents an overarching analytical framework. The framework includes empirical methods, research questions and a brief description of the selected field sites.

In the following section, I seek to elucidate how notions of 'institutions' and 'normativity' are used in sociological theory. Arguably, this is a Herculean task, mostly because of the sheer diversity of institutional perspectives in the social sciences. As a consequence, I do not intend this review to be fully exhaustive. What I will do instead is focus on strands of institutional theory that I consider most relevant with regard

to their analytical and methodological implications for the question of how institutions influence and mediate adaptive processes and risks. The theories that are discussed in the first section are mostly derived from two complementary bodies of literature: the so-called *new institutionalism* (NI), which also includes *New Institutional Economics* (NIE), and scholarship concerned with the institutional dimensions of environmental change.¹⁶ By tracing the sociological origins of these diverse strands of research, I ultimately seek to illustrate that questions about the emergence of power effects and normative behavior are, indeed, at the very heart of the adaptation challenge.

Normativity and Institutional Theory in the Social Sciences

In his article "What Are Institutions?" Geoffrey M. Hodgson revisits one of the fundamental challenges of institutional theory, namely to establish a common definition of the term institution. Establishing a standard definition, Hodgson argues, is potentially possible and should be a prerequisite before conducting empirical and theoretical analyses of how particular institutions function (Hodgson 2006, p. 1).

At the heart of Hodgson's definition of institutions is the idea that institutions are *social rule-systems* (Hodgson 2006, p. 2). Similar ideas have also been put forward by other scholars of NIE, such as Douglass North, who defines institutions as "the rules of the game in a society

¹⁶ Scholarship focusing on the institutional dimensions of environmental change can be found in a variety of subdisciplines, for instance in adaptation research, vulnerability and resilience research as well as in political geography, critical theory, development research, political ecology, and institutional anthropology.

or, more formally, (...) the humanly devised constraints that shape human interaction" (North 1990, p. 3).¹⁷

In light of these definitions, and taking into account the centrality of the word *rule*, several questions come to mind. How exactly does a rule-system function? How can rule-following behavior be explained, and what exactly motivates people to individually or collectively follow or disobey particular rules? And last but not least, what is meant by *the game* and who plays it?

Regarding the latter question, Elinor Ostrom eloquently points to the fact that "we cannot communicate effectively if signs used by one scholar in a field have different referents than the same sign used by another scholar in the same field. As scholars, we are in our own game situation – a language generating game" (Ostrom 1986, p. 4).

Arguably, this game has been played extensively by many scholars of institutional theory who study the nature of institutions and social organization, and see themselves as followers of the *new institutionalism* (March and Olsen 1984). According to Ensminger (1998, p. 774), the new institutionalism "is the study of how institutions affect the behavior of individuals and how individual behavior affects the evolution of institutions; pivotal to these relations is the role of incentives." Generally, the body of scholarship that constitutes the NI is highly diverse and encompasses different strands of institutionalist thinking such as (1) organizational or sociological institutionalism, (2) rational choice institutionalism, (3) empirical institutionalism, (4) historical institu-

¹⁷ The interdisciplinary approach of New Institutional Economics (NIE) analyzes the influence of institutions on economic processes and performance. It takes the transaction as the primary unit of analysis (DiMaggio and Powell 1991, p. 4). NIE builds on, modifies, and extends neoclassical theory, while abandoning neoclassical assumptions about the instrumental rationality of human beings (North 1995). Instead, NIE assumes that humans face multiple risks and uncertainties related to unforeseen events and outcomes (Ménard and Shirley 2008, p. 1). As a consequence, NIE asserts that institutions are formed to reduce uncertainty in human exchange (North 1995).

tionalism, (5) international institutionalism, (6) and discursive institutionalism.¹⁸ Considering the analytical goal of this study, namely to investigate institutional influences on adaptive processes, two strands of institutionalist thinking are deemed particularly suitable and will therefore be discussed in greater detail below: organizational or sociological institutionalism, and discursive institutionalism.

Organizational or *sociological institutionalism* is one of the oldest and most developed branches of the so-called new institutionalism(s). It emerged as a subfield of organization theory in the late 1970s, when much of the pioneering work was done by Stanford sociologists such as Meyer and Rowan (1977) and Lynne G. Zucker (1977), who portrayed management theory and practice as myth and symbol, and started to investigate the social construction of rationalized organizing principles (Dobbin 1994, p. 117). This *constructivist* perspective on institutional theory is firmly rooted in the social phenomenology of Alfred Schütz as well as in Peter Berger and Thomas Luckmann's seminal work on "The Social Construction of Reality" (1966). According to this perspective, institutions are seen as "subjective social phenomena that are *derived from* experience rather than objective natural phenomena that are *revealed through* experience" (Dobbin 1994, p. 122). In other words, it is assumed that objective, unmediated or non-normative representations of institutions do not exist. Representations are always contingent upon social contexts and the ways in which we, as individuals, make use of our language. As a result, institutional settings are

¹⁸In addition to the six major categories, other strands of institutionalist research such as *feminist institutionalism*, *world polity institutionalism*, and *normative institutionalism* exist. However, I consider it useful to integrate the normative approach into the broader category of organizational or sociological institutionalism. This is because I understand "normative" institutionalism (as defined by Peters 2012, p. 27) to be part of the same intellectual tradition that stands behind the organizational or sociological strand of NI. Moreover, *discursive institutionalism* is sometimes referred to as "constructivist" institutionalism. This categorization may potentially lead to confusion, since the (older) strand of sociological institutionalism is also firmly rooted in the constructivist tradition.

perceived to be permanently changing according to the way in which we assign meaning to them through shared definitions of reality and fill them with life through our interactions and shared social practices.

Following this tradition, contemporary work associated with organizational or sociological institutionalism is primarily concerned with processes of institutionalization, symbolic aspects of social behavior and the dynamics between (and within) organizations. Sociological institutionalism explores how institutions emerge and change, and aims to study the functioning and structures of institutions with reference to the values, culture, norms and expectations of their social environment. In doing so, it also builds on normative sociological theories that have been developed by *structural functionalists* such as Émile Durkheim, who referred to sociology as the "science of institutions, their genesis, and their functioning" (Durkheim [1895] 1982, p. 45), as well as Talcott Parsons, who described "normative orientation" as a necessary condition for every consistent action and social order (Parsons 1937, p. 44). Structural functionalism, defined as a subfield of *normative sociology*, provides a relatively straightforward account of human behavior that is in some aspects similar to the approach taken by New Institutional Economics.¹⁹ This approach is based on the assumption that human beings ...

depend on some means to drastically reduce a situation's complexity, i.e. a way to systematize its components into one meaningful order, thereby abstracting from some components as being irrelevant. From this stems the importance of mental models, or schemas, in which the cultural meaning of typical situations is embodied, and which are activated upon entering a situation (Kroneberg 2006, p. 4).

This idea of human behavior is also an integral part of the action theories in the Mead-Blumer tradition of the so-called symbolic interaction-

¹⁹The term normative sociology is often used to describe research in social philosophy that is either focused on the assertion or rejection of ethical norms. I will use the term in a broader sense, as referring to *sociological research on norms and normativity*.

ism according to which individuals "interactively construct the meaning of an undefined situation by sending and interpreting significant symbols" (Kroneberg 2006, p. 4).

An alternative position in normative sociology, namely that human beings exercise different degrees of rationality, originates from the work of Max Weber. Weber essentially assumes that human beings rarely engage in means-end rational action and seldom weight action alternatives and their expected consequences against one another (Kroneberg 2006, p. 7). Quite on the contrary, social actions are often influenced by habitual, affectual, and traditional factors. However, aside from his famous typology of action, Weber portrays the rationalization and institutionalization of the social sphere as the inescapable fate of modern societies, exemplified by the "iron cage"²⁰ of the bureaucratic state administration which embodies the highest structural form of rationality (Weber [1930] 2005, p. 123). Indeed, Max Weber's conceptions of the sovereign state may be regarded as partially outdated in view of recent discussions around global governance, failed states, and the rise of legitimate agency beyond the state (Schulz 2011, p. 23). His concern about social stratification and the ability of modern bureaucracies to accumulate power and authority nonetheless remains a rallying point for critical thought in the social sciences. Max Weber, although he never made an explicit attempt to develop a general theory of institutions, consequently describes rationalized and bureaucratic administration as "domination through knowledge" (Weber 1978, p. 225).

Karl Marx, another famous representative of the normative approach to sociology, also sought to analyze human history with reference to knowledge, power and social stratification, but based on the notion of class conflict. Contrary to functionalists such as Durkheim and Parsons, who see societal outcomes as the result of shared (cultural) values

²⁰ The English translation "iron cage" is not very precise, since Weber originally uses the expression "*stahlhartes Gehäuse*" (a shell as hard as steel). For a detailed discussion of the analytical implications see: Baehr 2001.

and differentiated norms, the Marxian approach to normative sociology proceeds on the assumption that the capitalist system is ultimately self-defeatist and repressive, and that it can only be overcome through a united working class by means of self-emancipation and revolutionary struggle. Thus, in comparison to the functionalist mode of explanation, Marxism subscribes to a fundamentally different interpretation of normative and institutionalized behavior, which is based on the analysis of labor, capitalism and class consciousness.

Arguably, this remarkable diversity of sociological approaches to normative analysis can be traced back to the fact that numerous norms, rules, and institutions pervade every aspect of social life. Following this line of thought, it becomes readily apparent why scholarly interest in institutions cuts across various disciplines such as political science, sociology, anthropology, law, psychology, organizational studies and economics, just to name a few. The great variety of approaches may also be related to the relativist notion that finding a definition of the term institution "is not an issue of right or wrong; it depends on the purpose of the analysis" (Aoki 2001, p. 10). Accordingly, the rise of various strands of institutionalism may reflect the tendency of individual scholars to apply their own disciplinary views about the nature of human behavior to the study of institutionalization and institutional evolution. Essentially, scholars in this tradition share the common interest of exploring and describing the relationship between institutions and individuals vis-à-vis the notion of agency, although they generally differ in their thematic focus as well as their theoretical understanding of what a social institution or 'the political' actually is. As a result of this internal diversity, institutional theory is often accused of lacking a unifying empirical theory of institutions that is not only falsifiable, but also able to explain why scholars should concentrate on institutions as an analytical category, instead of "simply looking at rule-based behavior, or the impact of particular rules or norms" (Peters 2012, pp. 91-92).

Implicitly, Geoffrey M. Hodgson adopts this critical view in his attempt to define institutions. As mentioned in the beginning of this section, Hodgson's argument is based on the idea that institutions are essentially *social rule-systems*, and that they should be studied as such. Furthermore, he states that contrastive usages of terms such as 'institutions', 'rules', 'conventions' and 'organizations' are not necessarily criterial. Instead, Hodgson assumes that these terms are just symptomatic of essential properties (*social genotypes*) of the basic concepts that undergird them (Hodgson 2006, p. 18). Such social genotypes are, for instance, included in the general understanding of institutions as "systems of established and embedded social rules that structure social interactions" (Hodgson 2006, p. 18). Human language, monetary systems, legal frameworks, table manners as well as systems of weights and measures can thus be considered institutions (Hodgson 2006, p. 2).

Nevertheless, two important questions have to be answered in the context of Hodgson's approach to institutions, namely *how* social rule-systems structure social interactions, and *how* they are established and embedded. To answer these important questions, it is crucial to look at the way in which Hodgson configures his definition of rules. Initially, he defines rules as "socially transmitted and customary normative injunctions or immanently normative dispositions, that in circumstances X do Y" (Hodgson 2006, p. 18). This complex definition alludes to the idea that rules cannot perpetuate themselves directly, but replicate through social mechanisms. Rules are not simply the result of inherited genes or instincts, but embedded in shared habits of thought and behavior and therefore *socially transmitted* (Hodgson 2006, p. 3). Arguably, rules can emerge as norms of behavior, social conventions, or legal rules. According to Hodgson's definition of rules, the category of *customary normative* rules is especially important for assessing the relation between rules and legal frameworks. Hodgson points out that for new laws to become rules, they have to become customary, since there are also examples of laws that are widely ignored and have not acquired the customary or dispositional status of a rule (Hodgson 2006, p. 6). He

then brings forward the argument that "[i]gnored laws are not rules" (Hodgson 2006, p. 6). At the same time, he portrays rules as *immanently normative* if normative issues arise as soon as a particular rule is contested or critically analyzed.

The functioning of institutions, as Hodgson concludes, is therefore directly related to the psychological mechanism of *habituation*. The social acquisition of habits (or habituation) can be characterized as an example for one of the aforementioned social genotypes. Thus, habituation is a key element for Hodgson to understand how and why institutions structure social interactions, and how and why they are established and embedded in social life. Habits are conceptualized as "the constitutive material of institutions, providing them with enhanced durability, power, and normative authority" (Hodgson 2006, p. 7). Therefore, habituation "is the psychological mechanism that forms the basis of much rule-following behavior" and occurs when individuals *unconsciously conform* to the behavioral norms of their society (Hodgson 2006, p. 7).

Hodgson also discusses the controversial distinction between institutions and organizations as well as between 'formal' and 'informal' institutions. Especially Douglass North's influential formulations of these terms are criticized for being incomplete and misleading. Hodgson finds that their ambiguous use created much confusion and suggests to define an organization as a special type of institution involving membership, sovereignty, and chains of command delineating responsibilities (Hodgson 2006, p. 18).²¹ Regarding the distinction between "formal" and "informal" institutions, Hodgson stresses the need to either abandon these words entirely or at least to use them with extreme care. He further proposes that "[i]t may be best to use more precise terms such as *legal*, *nonlegal*, and *explicit* instead" (Hodgson 2006, p. 13).

²¹ Recent social phenomena such as virtual collectives (e. g. *Anonymous*) make it increasingly problematic to maintain that organizations are necessarily tied to a certain location and defined by hierarchies, budgets, and legal status.

Other typologies of institutions are also discussed by Hodgson, including the difference between self-organizing and other institutions, and the differences in degrees of sensitivity to varying personality types of the agents involved in particular institutions. Here, Hodgson tries to avoid overgeneralizations concerning the nature of institutions, and emphasizes that it would be a mistake to suggest that all institutions are self-organizing. He claims to have shown "that some institutional rules require other institutions for their enforcement" (Hodgson 2006, p. 18). Moreover, Hodgson argues that one would be equally mistaken to conceptualize all institutions as insensitive to the personalities or psychologies of the people involved. This, according to Hodgson, would "lead to the further error of conflating individuals into the institutional structure, where the interplay of both is required to understand how institutions are formed and sustained" (Hodgson 2006, p. 19).

In the course of his argumentation, Hodgson nevertheless avoids to define the exact difference between 'rules' and 'norms' or 'normative' behavior, which is implicit in his definition of rules and institutions. Similarly, his aforementioned definition of 'habit' and 'habituation' includes the term 'normative authority', which is also left unexplained. By only rushing through some attempts to distinguish between habituation, norms/normativity and rules, and by only briefly mentioning the related difficulties, Hodgson leaves the reader rather confused about the fact that he seemingly does not perceive a major difference between these terms, while, at the same time, he uses 'normative' as a distinct category in his definitions of rules, habits, and institutions.

In light of these conceptual vacuities, another attempt to structure the various strands of institutionalism and institutional theory has been made by William R. Scott (1995). Scott proposes to distinguish between three analytical perspectives on institutional order. These perspectives are *regulative*, *normative*, and *cultural-cognitive*.

Scott sees the regulative perspective as the one being related to rule-setting, monitoring, and sanctioning activities, while the normative

perspective is focused on the prescriptive, evaluative, and obligatory aspects of social life; the cultural-cognitive perspective, in turn, describes the "shared conceptions that constitute the nature of social reality and the frames through which meaning is made" (Scott 2008, p. 428). Scott also readily acknowledges that, in practice, these perspectives are often overlapping. Moreover, he states that the cultural-cognitive perspective, in particular, correlates with "the deeper foundations of institutional forms (...) the infrastructure on which not only beliefs, but norms and rules rest" (Scott 2008, p. 429, also see Greenwood *et al.* 2008, p. 15). Indeed, Scott's three perspectives (or 'pillars') have become one of the most influential contributions to institutional theory in recent years. However, it seems as if Scott's categorization has just opened up another Pandora's box of conceptual difficulties. The biggest problem is perhaps to explain the emergence of normativity out of the relationship between culture and cognition. Assuming that agency, power, and discourse are reintroduced into the debate and that essentialist views of culture are inherently problematic, this conceptual puzzle certainly demands further clarification.

Meanwhile, mostly as a result of the poststructuralist turn in political science, the new institutionalism has been fiercely criticized for undervaluing the agency of actors in processes of institutional change. The main thrust of this critique was directed at "stop-go models" of change that were unable to incorporate the dynamic interplay between social interactions, institutional constraints and contextual factors (Lowndes and Roberts 2013, p. 129-130). Yet it is fair to say that this rather static view of institutional change has been considerably revised in recent years. Concerning the relationship between agency, power and institutional change, the 'revised' institutionalist position may be summarized as follows:

Institutionalists never assume that institutions and power have reached an equilibrium, explaining institutional change does not present a problem. Institutions do not determine behavior, they simply provide a context for actions that helps us to understand why actors make the choices that they do. Facing the same sets of institutional

hurdles, self-reflective actors can make creative decisions about how to proceed. Thus, institutions – even when defined in the broadest sense – neither mold human perceptions to such an extent that individuals are incapable of recognizing competing definitions of identity and interest nor do they force human action along a single track (Immergut 1998, p. 26).

It is nonetheless true that an understanding of discursive elements "as distinct from rationalist interests, path-dependent history, and cultural framing" is a relatively new phenomenon in institutional theory (Schmidt 2010, p. 3). From an institutionalist perspective, scholarly interest in ideas and discourses mostly came with the motivation to study how particular discourses create relationships and channel "authority through the articulation of norms" (Brown 2006, p. 71). In other words, discourse analysis is seen as an ideal instrument to assess instances of normative change, ambiguity, and contestation. Moreover, discourse analysis is perceived as a well-suited method to explore processes of (de)politicization and the normative underpinnings of policies and practices. However, combining ideas of discourse analysis and normative sociology still poses serious conceptual challenges. The main challenge is to find an answer to the question of what drives institutional dynamics. Should institutions themselves be at the heart of our explanations as mainstream institutional theory proposes, or is it perhaps more rewarding to focus on ideational change instead, as the discursive approach suggests?

Following the lead of Lowndes and Roberts (2013, p. 134), I argue that social theorists would be well advised to guard against the tendency to perceive institutions as "empty vessels in which ideas can be poured" and to downplay the constraining effects that institutions may have upon "the adoption of ideas or the (...) shaping of behavior". In other words, institutions do not simply function as ideational 'containers' for political entrepreneurs who wield and yield discursive power. They also structure the context in which ideas emerge. Furthermore, it follows from the above that the notion of an *idea*, in a Platonic sense

(*tópos noētós*), appears to be rather elusive. Empirically speaking, ideas are hardly traceable, unless they are mediated by cognitive interpretations according to which meaning ('truth') is created and specific impulses for inaction or action ('ought') are given. An 'ought', however, does not necessarily need to be a 'moral ought'. This means that ideas are inherently normative, but not in the sense of 'moral truth'. Ideas are seen as "causal beliefs" (Béland and Cox 2011, p. 3). Thus, when we consider hierarchies of causal beliefs, another empirical problem occurs. How do we assess, for instance, which ideas ultimately trigger specific decisions or actions?

From a normative point of view, this problem can be largely avoided by arguing that it is not of primary importance to study whether ideas have an effect or not, but to consider how power and normative orders affect the ways in which ideas are expressed and discourses conveyed (contrary to Schmidt 2010, p. 21). At first sight, it is therefore essential to employ a theoretical approach that addresses the respective weaknesses of both, structuralist and discursive taxonomies.

In this analysis, I will follow Keller (2011, p. 48) in defining *discourses* as "performative statement practices which constitute reality orders and also produce power effects in a conflict-ridden network of social actors (...) and knowledge systems". Adopting this approach means to adopt a critical and situational logic, according to which 'truth' is created through shared normative definitions of reality, but not independent of power relations and material, social, political, cultural and historical circumstances and practices.

Furthermore, to gain a clearer analytical perspective on institutional theory, I suggest to turn to the concept of *normativity* itself. Normativity, on the one hand, governs meaning and presupposes the fact that social structures, practices, and symbolic meanings are intrinsically value laden. Norms, on the other hand, are conceived as cognitive meaning-making devices and are therefore socially transmitted. They

gain validity by virtue of their repetition and performativity in contexts of social interaction (Bicchieri 2006, p. 2). Institutions, then, are seen to encapsulate divergent normative interpretations of human behavior (O'Riordan and Jordan 1999, p. 81). Quite clearly, we experience in our everyday lives that normative meanings exist at the core of every institution. Their transient stability or propensities for change, however, are mediated by less visible and relational influences of power, alongside indirect and manifold ways in which these dynamics are sustained (Cleaver 2012, p. 22). As Kothari (2001, pp. 144-145) argues, meanings are shaped by "strategies of normalization" through a multitude of everyday processes such as codification, classification, representation, performativity, and self-surveillance.

Nevertheless, in view of these complex social processes, and since the overall goal of this chapter is to combine discursive with normative taxonomies, a more structured engagement with the philosophical dimension of normativity is required. Overall, it has become clear that discursive and normative approaches in the social sciences operate with fundamentally different epistemologies and ontologies. To be able to link the concept of normativity to recent accounts of cognition, power and discourse, I consider it necessary to move beyond binary oppositions that are commonly associated with the notion of normativity, such as 'prescriptive' and 'descriptive' research. I also maintain that a more thorough engagement with the ethical dimensions of nature-society relations is in fact a prerequisite for a transformative approach to adaptation, since our normative and ontological interpretations of 'nature' and its riskiness have profound ethical implications for adaptation research and practice.

Toward Transformative Politics: Normative Sociology and the Question of Ethics

Now, sociology is (...) trying to become a superscience, the science that explains all others. But how could it escape the very disqualification it brings on the other sciences? (Stengers 2000, p. 2-3)

[E]ntire Ph.D. programs are still running to make sure that good American kids are learning the hard way that facts are made up, that there is no such thing as natural, unmediated, unbiased access to truth, that we are always prisoners of language, that we always speak from a particular standpoint, and so on, while dangerous extremists are using the very same argument of social construction to destroy hard-won evidence that could save our lives. (...) Why does it burn my tongue to say that global warming is a fact whether you like it or not? (...) The critic is not the one who debunks, but the one who assembles. The critic is not the one who lifts the rugs from under the feet of the naïve believers, but the one who offers the participants arenas in which to gather. The critic is not the one who alternates haphazardly between antifetishism and positivism like the drunk iconoclast drawn by Goya, but the one for whom, if something is constructed, then it means it is fragile and thus in great need of care and caution. (Latour 2004, p. 227; 246)

In the beginning of the new millennium, Paul R. Brass wrote a journal article titled "Foucault steals political science". In his article, Brass (2000, p. 2) argues that "the subject matter of what has been traditionally considered central to the discipline, namely, power and government, has been stolen by Foucault while central trends in the discipline as a whole have departed markedly from serious engagement with those topics." It is clear that even sixteen years later, it is hardly imaginable for political scientists and institutional theorists to avoid regular forays into Foucauldian territory. Foucauldian notions of power and 'normal vs. pathological', 'dispositif', 'governmentality' and 'discourse' are common features of social science research with a political outlook. This 'Foucauldian imperative' nevertheless raises specific theoretical questions that need to be considered before combining normative sociology with ideational or discursive approaches. Bearing in mind the

call to 'bring the political back' into research on climate change adaptation, the crucial point is to understand more thoroughly how power and resistance play out in practice.

Before engaging with this problem, however, I would like to clarify what I mean by the term *normative sociology*. As previously mentioned, the notion of normative sociology is typically associated with theories of structural functionalism and the work of seminal sociologist Talcott Parsons. For most social theorists, this implies mechanistic rigidity and a Parsonian overemphasis on the unity of culture and the structural constraints of society. In other words, normative sociology is considered a relic of the past. Rational choice theory, "in responding to the 'over-socialized' individual of Parsonian sociology, has gone to the polar extreme and proposed (...) an individual that is judged to be 'mal-functioning' when he or she fails to act as a 'norm-free' rationalist" (Shilling and Mellor 2001, p. 180).

Meso-level theory, in turn, has largely sought to avoid these polarized debates about the nature of normativity by defining norms as the "enactment of negotiated meanings" (Fine 2001, p. 139). Adopting such a practice-based view of normativity, however, comes with its own set of conceptual difficulties. Initially, it needs to be considered that normativity is not only about the subjective enactment and negotiation of norms, but also about the *cognitive order* of society (Strydom 2013). A practice-based view of normativity which identifies the individual as the sole "*source and center* of psychological experiences" undervalues the fact that normative systems and communities precede individual knowledge (Moghaddam 2010, p. 465). To put it in a different way, it is important to realize that intersubjective normative knowledge exists prior to the individual internalization of this knowledge, logically as well as ontogenetically, thus rendering norms the basic form of social facts (Sinha 2009, Bianchin 2015).

Nevertheless, *cognitive order* is not generated by norms alone, as individuals possess the innate capacity to question and transcend shared

normative standards. In light of such contingent conditions, cognitive order does not simply imply a rigid either/or distinction between epistemic objectivism and constructivism. Quite to the contrary, it accentuates those higher-order cognitive and emotional abilities that are learned in social interactions, and mediated through culturally shaped narratives and systems of symbolic representation. These learned higher-order abilities structure the formation of our normative cognition, making culture and normative cognition mutually constitutive, and allowing individuals to understand, apply or reject normative concepts (see, for instance Jensen 2013, Deacon 2014).

The crux of the matter is that ontological, epistemological, and ethical questions arise as soon as, meanings are negotiated, concepts are introduced, and behavior is regulated in a social context. As a result of our human ability for ethical reasoning, we are constantly faced with the potentiality of our actions and the burden of moral choice. Normative sociology, in this sense, "is logically inescapable because we need to rationally defend either advocating moral norms or else refusing to do so" (Szybel 2009, p. 86).

To be more precise at this point, it may be prudent to note that these initial insights about norms and moral behavior do not preclude the distinction between normative and empirical arguments in the social sciences. For the sake of greater clarity of the argument, it is indeed considered necessary to maintain this distinction, while acknowledging that "integrating facts and values in the same work does not entail their conflation" (Gerring and Yesnowitz 2006, p. 121). Applying normative sociology in the context of anthropogenic climate change, then, requires us to distinguish between two analytical approaches to norms and facticity. By accentuating the differences as well as the similarities between these two approaches, I shall hope to convince the reader that philosophy and social theory are all but irrelevant for real-life concerns, and that the problem of climate change adaptation demands a more thorough engagement with ethical questions. Therefore, let me begin by briefly introducing the two approaches.

According to the first approach, which I refer to as the *postmodern* approach to normativity, norms are seen as socially constructed, subjective, and historically instituted.²² This is to say, norms are contingent social facts or obligations which gain validity only in relation to self-referential systems of language. Moreover, the postmodern position holds that normativity is expressed through totalizing systems of thought. Examples for such totalizing systems of thought are supposed to be found in the grand meta-narratives of Enlightenment rationality and linear historical progress. Studying normativity in accordance with the postmodern approach, therefore, means to 'work backwards' to uncover the contingent nature of all normative orientations. Arguably, this can be achieved by engaging in an *archaeology/genealogy* of power and knowledge, based on reflexivity and deconstruction.

In philosophy, postmodern thought proceeds from the Spinozian and Nietzschean tradition, advocating for a metaphysics and ontology of immanence and difference. According to the Stanford Encyclopedia of Philosophy, postmodern philosophy can thus be described as a gesture of resistance against the "univocity of meaning", "epistemic certainty", and essentialist concepts of identity. Veritable traces of this intellectual tradition can be found in the work of Michel Foucault and Jacques Derrida, in the feminist critique of Donna Haraway, and notably, in the philosophical writings of Gilles Deleuze and Félix Guattari.²³

The second approach to normativity which I consider to be of vital importance for this study is rooted in Hegelian philosophy and a cognitivist reading of contemporary critical theory. This approach, based in the key concept of *immanent transcendence*²⁴, perceives the immanent and transcendent – or actual and potential – dimensions of the social

²² Here I use the umbrella term 'postmodern' to designate a poststructuralist and post-phenomenological orientation in philosophy and social theory.

²³ This selection of 'postmodern' theorists is evidently non-exhaustive.

²⁴ The concept of immanent transcendence holds that transcendence (God, the One, the Absolute, the Other, depending on the scholarly interpretation) is experienced in and through physical actuality, but at the same time irreducible to it.

world as mutually constituting. What is particularly relevant about this *weak naturalistic* view of a "situated reason" (Strydom 2011, p. 69) is that it reaches beyond postmodern ideas of immanent ethical evaluation, which are either fundamentally opposed to universal standards of 'morality', 'essence' and 'truth', or conceive of these transcendental 'absolutes' as proto-totalitarian. However, when combined with the anti-normative tenets of a self-proclaimed value-free science, this postmodern eclipse of ideal absolutes for the sake of liberal pluralism makes for a peculiar (post-)political alliance, as I shall discuss later in this section.

What is important for now, however, is the tendency in postmodern ethics to reject the existence of a universal, pre-social (*transcendental*), and non-contingent sphere whose potentiality sustains all the contingencies of created reality. In other words, by removing universality from the meta-ethical discourse, postmodern ethics runs the risk of depriving the human imagination of a transcendental, unfulfilled sociocultural potential which is materially embodied in the *cognitive order* of society.²⁵ Contrary to this sentiment, I argue that the transformative enactment and radicalization of this unfulfilled evolutionary potential vis-à-vis the historical sediments of institutional life and time-dependent moral judgement is the very essence of political movement. Attempts to reject normative universals by pandering to the slippery slope of anti-foundationalist and anti-realist rhetoric must therefore be regarded as a straw man debate. Overall, social theory has to maintain a strong focus on normativity, as it "needs to provide a normative

²⁵ The immanent transcendence of the cognitive order, seen through a Hegelian lens, means that "we are embodied *beyond* our individuality, which is to say our identities as persons are not simply identical with our identities as bodies: we are embodied in language and social institutions, which means there can be a meaningful distinction between me and my body, and we are informed by autonomous rationality (which we might call 'mind' proper), which means there can be a meaningful distinction between terms that define our finite perspectives and those finite perspectives themselves" (Russon 2015 on Hegel's 'Philosophy of Mind', p. 55-56; emphasis in the original).

framework able to distinguish between the emancipatory and the repressive potentials of human reality" (Susen 2009, p. 105). A postmodern epistemological nihilism which seeks to unveil the hegemonic, contingent and totalizing nature of normative universals is, therefore, in itself ...

merely a naïve form of foundationalism insofar as it will always posit a privileged determiner without being able to justify that privilege [and thus] undermines its own ability to make any normative evaluations at all – not only with respect to the now-common pretense that all universal claims (that is, universally) conceal a particular content (or constitute a hegemonic stand-in) but even with respect to the very forms of domination it otherwise wishes to criticize (Kisner 2008, p. 9)

Thus, to preclude accusations of both ethical nihilism and crypto-normativism, postmodern skepticism posits historically and culturally contingent discursive engagement as the only valid perspective from which meaningful questions about ethical life can be raised. In other words, what unites the diverse intellectual branches of postmodernism, postphenomenology and poststructuralism is the desire to avoid an absolutist approach toward ethical justification, and to recast the ethical question in ontological terms. Much of this thinking stands in the direct tradition of Theodor Adorno, Jacques Derrida and Emmanuel Lévinas, whereas the latter describes the face-to-face encounter and conversation with the *other* as "the ethical model of relationships par excellence" (Madison and Fairbairn 1999, p. 4).

Yet, to put it rather polemically, if we fully embrace this ethical principle shouldn't we have simply conversed more thoroughly with the murderers in Auschwitz to convince them of their hideous wrongdoing? Quite obviously, this seems to be an absurd foundation for applied ethics. Strangely enough, this ethical model is put forward by an eminent Jewish scholar and survivor of the Shoah. At a second glance, this initial contradiction may nonetheless point us to a deeper insight that implicitly links the Lévinasian tradition of ethical reasoning with

Hegelian philosophy and contemporary critical theory. To further explicate this connection we may quote Jean-Luc Nancy (1991, p. 35; emphasis added) who states that "the concentration camp (...) is in essence the will to destroy community. But even in the camp itself, undoubtedly, community never entirely ceases to resist this will. Community, is, in a sense, resistance itself: namely, *resistance to immanence*." In line with an interpretation offered by Mathew Abbott (2012, p. 28), we may further assume that resistance to immanence does not mean that "humanity is indestructible; it says there is something inhuman in it that remains. It is not identity, which can be destroyed, but the impersonal core of singularity." Derrida himself speaks of this impersonal singularity as the *undeconstructability of justice*, which he separates from the deconstructability of *droit*, authority, legitimacy (Derrida 1990, p. 945; also see Zlomislíć 2007, p. 250; Hoy 2004, p. 186). According to Derrida, an ethical call to justice is placed on us *only* through the singular encounter of the immanent 'I' with the radical transcendence of the 'other'. What is interesting in this regard is that there is neither reciprocity nor community assumed in this encounter between the 'I' and the 'other' (or the immanent and the transcendent). Their relationship is conceptualized in merely passive terms – "Nothing prevents the ethical treatment of the other *as other* from sinking into mere indifference" (Kruger 2011, p. 207; emphasis added).

From a Hegelian perspective, the concept of undeconstructable justice thus fails to describe what is really at stake in the realm of ethical life.²⁶ While ethics according Lévinas and Derrida assume that a call for justice is placed on the subject through its transcendent relationship with the radically other, the Hegelian position, by contrast, postulates that

²⁶ Before engaging in this debate, it is warranted to caution against a postmodern caricature of Hegel as a philosopher of 'Absolute Knowing' whose syncretizing dialectic and rational subject is the arch enemy of all ontological difference and plurality. Not only is this picture of Hegel fundamentally distorted, it also hinders a productive engagement between Hegelian and postmodern thought. For a summary of these common misrepresentations see Houle and Vernon 2013.

justice has to be thought in relation to a dialectical *rupture* in/of immanence itself. Following Slavoj Žižek's interpretation of Hegelian philosophy, this rupture is based in the fact that there is no "ontological guarantee or foundation" of ethics and justice in the "a priori Void of Being" (2008, p. 187). In other words, the ideal of justice *must* produce dialectical difference and contradiction, because it involves the act of *judging* – the split of the Hegelian 'concept' – which immanently moves historical transformations (Nuzzo 2012, p. 11). Žižek remarks that ...

the endless postponement of the arrival of a fully moral universe is not just an effect of the gap between the purity of the Ideal and the empirical circumstances which prevent its full actualization, it is *located in this Ideal itself*, inscribing a contradiction (...) into its very heart (Žižek 2014, p. 33).

This is precisely the reason why Hegelian philosophy cautions against ambiguous claims that assert the 'undeconstructability' of justice. For Hegel, "it is only within the institutional structures of ethical life that anything like the claims of morality can be pursued and realized" (Speight 2008, p. 78). In other words, because "history and (...) human subjectivity (...) are constantly transforming themselves", it is only in relation to *dynamic institutional structures* that ethical life fully realizes itself (Lumsden 2013, p. 135).

However, while this philosophical recourse to the foundations of modern and postmodern ethics seems to be rather abstract at first, it becomes immediately relevant when we speak of *climate justice* and risk. This view is also supported by the fifth IPCC Assessment Report which clearly states that "[i]ssues of equity, justice, and fairness arise with respect to mitigation and adaptation," and that "[m]any areas of climate policy-making involve value judgements and ethical considerations" (IPCC 2014a, p. 5). For instance, if we perceive problems such as climate change, biodiversity loss and nitrogenization through the lens of 'planetary boundaries' – that is, potentially dangerous thresholds and tipping points in socio-ecological systems and the biosphere – we also

need to consider how these boundaries are defined as a result of *normative and ethical judgements*. This definitional problem is explicitly acknowledged by natural scientists working on planetary boundaries, notably by Rockström *et al.* (2009, p. 5, Fig. 3), who summarize the criteria and process for the definition and identification of planetary boundaries as follows:

Although current scientific understanding underpins the analysis of the existence, location, and nature of thresholds, normative judgements influence the definition and the position of planetary boundaries:

- The selection of planetary boundaries emerges from the definition of what constitutes unacceptable human-induced global environmental change.
- The position of a planetary boundary is a function of the degree of risk a community is willing to take (...)
- The position is furthermore a function of the social and ecological resilience of the impacted societies (...)
- Boundaries are identified for processes where the time needed to trigger an abrupt or irreversible change is within an 'ethical time horizon' – a timeframe (i) short enough to influence today's decisions yet long enough to provide a basis for sustainability over many generations to come, and (ii) within which decisions taken can influence whether or not the estimated threshold is crossed.

This example shows that climate change presents us with a unique normative challenge due to the fact that its consequences over time are largely unpredictable, and that the actual and potential costs of inaction are high for affected individuals as well as for future generations. The way in which these normative and adaptive challenges ought to be addressed from an ethical perspective is nonetheless a point of contention.

In the context of climate change adaptation, I therefore distinguish between three major types of normative ethics. The first approach is so-

called ethical *consequentialism* or utilitarianism. In decision making and risk management, consequentialism implies an ex-ante orientation toward anticipated outcomes. The core principle of consequentialist ethics is to 'optimize' the negative consequences of individual and collective actions based on economic aggregation and cost-benefit analyses. While this approach is mostly associated with mitigation efforts, it also plays an important role with regard to the reduction of potential harm, loss, and damage. The consequentialist approach nonetheless fails to deliver for several reasons. The first reason is that it is deemed possible within the utilitarian paradigm to evaluate and compare negative outcomes in monetary terms. That is, by means of simple aggregation (summation). The second reason is that the consequentialist paradigm standardizes human behavior by postulating that human beings seek to maximize their benefits and simply take decisions based on instrumental rationality.

Why are these assumptions problematic? On the one hand, it is not ethically justifiable to measure the value of a human life in monetary terms, to compare these values to each other, and to arrive at a conclusion about the value of a human life based on principles of economic utility maximization. Unmitigated consequentialism or utilitarianism may thus lead to a situation in which the death of a certain number of individuals (here we may also substitute the word death with property damage or injury) is deemed justifiable based on a rational cost-benefit analysis (Nida-Rümelin *et al.* 2012, p. 150). On the other hand, it needs to be acknowledged that rule-systems and individual orientations are based on a variety of normative and cultural values, and not simply on principles of rationality and utility maximization (Jamieson 2012, p. 190). Lastly, it is important to stress that ethical consequentialism is likely to result in maladaptive outcomes under conditions of deep uncertainty, either due to the erroneous prioritization of resource ('welfare') allocation, or because of the impossibility to account for the full range of consequences that particular actions might yield. Here, I will not even delve into the ethical question by which standards particular outcomes would qualify as 'good' and for whom.

As long as the workings of the global economic system are not even fully understood without taking climate change into account, it is indeed "almost unimaginable to suppose that we could aggregate the diverse impacts of global climate change in such a way as to dictate policy responses" (Jamieson 2012, p. 192).

In light of these severe limitations, an alternative approach to adaptation is to act in accordance with the *precautionary principle*. The precautionary principle states that under conditions of deep uncertainty, the best possible way to act is to minimize those risks which are potentially most harmful (the 'known unknowns'). When faced with the problem of adaptation and sustainable development, however, acting in accordance with the precautionary principle does not offer any tangible advantages over classical cost-benefit analyses (Nida-Rümelin *et al.* 2012, p. 122). On the contrary, applying the precautionary principle as a standard procedure for adaptation planning entails the danger of cascading failure due to a selective focus on particular risks (*target risks*), and the negligence of countervailing risks and systemic effects.

Yet, on account of the fact that the total elimination of risk is an impossibility, and that single approaches to climate change adaptation are not feasible, today's standard response is to employ an expert-centered and scenario-based model of risk evaluation and planning, based on "iterative risk management" (IPCC 2014b, p. 9). As I have outlined before, however, the crucial problem is that defining planetary boundaries and social risks under conditions of deep uncertainty depends on the normative (value-based) interpretation of models and projections. Although these methods are useful to reduce uncertainty and can be seen as relatively reliable tools for scenario planning, it is clear that quantitative approaches and predictive models also need to grossly simplify causalities, sociopolitical and economic processes, and complex 'nature/culture' relations. In light of the demand for further social science research in this field, the International Social Science Council (ISSC) concludes that in (...)

inter-disciplinary global change research, the focus has fallen sharply on the social sciences, with natural scientists, sponsors and funders alike calling for more social science, better social science and, very importantly, for more attention to global change challenges from mainstream social science disciplines. For the most part, these calls are driven by the simple recognition that if the fundamental causes and consequences of global change are social, then so must the solutions be (Hackmann and St. Clair 2012, p. 9).

When looking at climate change adaptation through a social lens, however, we are confronted with a collective action dilemma par excellence. This means that adaptation has to be regarded as a problem of *deontological* ethics as well. Deontological (duty-based) ethics, at least in their most extreme interpretation, proceed from a given set of 'absolute' normative values that are not to be compromised, *regardless* of the consequences that such actions may yield. In a strict deontological sense, this means to accept that certain acts should always be seen as morally wrong, even if they may prevent a greater evil to be committed. Various deontic principles are enshrined in national constitutions, legal systems, and a wide variety of international treaties and agreements. Their actual interpretation is, nonetheless, characterized by great cultural and normative differences, for example in the case of women's rights, labor rights, civic freedoms, and so on.

In the case of climate change, the key deontic principle is already at the heart of the UNFCCC and encapsulated in the commitment of all parties to stabilize greenhouse gas concentrations "at a level that would prevent dangerous anthropogenic interference with the climate system" (UNFCCC 1992, p. 9). Furthermore, the need for adaptive action is based on the conclusion that "[o]ver the next thirty years, substantial climate change is already inevitable, since mitigation will have only a minor effect on stocks of greenhouse gases in this time frame" (Stern 2006, p. 6). In view of this unsettling situation, and given the fact that the real occurrence of dangerous climate change has been repeatedly

stressed in the five IPCC reports, it must be concluded that ethical principles – whether they are based on consequentialist ethics, non-consequentialist ethics, or a mixture of both – have become secondary in importance, especially compared to realist accounts of an institutionally sustained politics of unsustainability.

To further illustrate how the normative primacy of *realpolitik* also applies to other deontic principles that are relevant for adaptation, let us briefly turn to the example of human rights. Here, even proponents of this approach are apt to concede that appealing to ambiguous universal standards such as human rights is a bold political venture. Whether human rights-based approaches are defined in a positive way (the affirmation of rights) or in a negative way (the violation of rights) seems to be of secondary importance in this context. Slavoj Žižek (2005, p. 128) remarks:

What the 'human rights of Third World suffering victims' effectively means today, in the predominant discourse, is the right of Western powers themselves to intervene politically, economically, culturally and militarily in the Third World countries of their choice, in the name of defending human rights.

In sum, it is certainly justified to read Žižek's example about the inversion of human rights not only as a political statement about interventionism, but also as an ethical argument. His example expresses the view that ethical norms can, and should not, be taken at face value. Normative statements contain *already*, and this is where Žižek follows Hegel, their very own distortion. This means that human rights are not simply distorted or pushed to the margins by exterior forces who breach or undermine them. Invoking ideal universals such as human rights as a foundation for normative ethics is *already* an ambiguous act in itself, precisely because human rights have to be politically and legally interpreted and enforced.

Obviously, this ambiguity does not imply that human rights are to be rejected *eo ipso*; nor does it mean to say that the International Bill of

Human Rights is of no value, or that the International Criminal Court should be abolished. But it certainly means to bear in mind that human rights are in practice a limited legal and political instrument. Human rights are factually not universal, because they are selectively applied. Defining human rights as a solid foundation to solve collective action problems such as climate change can therefore only be regarded as a highly optimistic political and cultural endeavor. At the same time, it is important to note that the political appropriation of human rights has not only been criticized by neo-Marxist public intellectuals. The notion of human rights, and especially of human rights law, has in fact been attacked by scholars from a variety of disciplines. Human rights discourses have come under considerable scrutiny for their paternalizing and neocolonial implications, their distortion through bureaucracies and institutions, and their negligence of the non-human dimension of ethical life, for example in the case of animal rights and environmental ethics (see Mutua 2002, Dembour 2010, Singer 2013).

These concerns have lately been taken up by the advocates of a non-anthropocentric approach to ethics and axiology. Vivid imageries of *technonatures*, *transhumanism* and *posthumanism* have become increasingly influential in the ethical debate on the fluid boundaries between nature, technology and humanity in the 21st century. Posthumanism, in particular, posits that property boundaries between (and chronotopes of) nature and culture are fundamentally blurred by processes of "cyborgization" and geoengineering, resulting in a fast-tracked hybridization of biological life, nature and technology (Cooper and Law 1995, Luke 2009). Most prominently, Donna Haraway refers to the introduction of her famous *cyborg* metaphor into social theory as an act of "blasphemy" (Haraway 1991, p. 149). Haraway's provocative metaphor of the human machine relativizes the fixedness and uniqueness of the human subject experience as well as the spiritual value of Nature by postulating *Nature-as-virtuality*. But more interestingly, and perhaps unwittingly, the cyborg metaphor has also gained renewed salience due to the discussion about the boundaries between nature and

culture in times of anthropogenic climate change. Newer strands of posthumanism, for example, are suggesting to extend our *ethical responsibility* beyond our own species, and to reconfigure our moral perception of anthropocentrism, animal rights, the environment, identity politics, corporeality, and so forth (Hobden 2014, pp. 175-177).

It is precisely at this crossroads between sociology, ethics and politics where critical theory reminds us to ask ourselves how discourses about *humanism vs. posthumanism* and *immanence vs. transcendence* may potentially result in new forms of exploitation. Yet, for critical theory to be relevant, so I argue, it does not necessarily have to be linked to a normative or political perspective such as humanism, environmentalism, or Marxism. Its critical approach is already justified by the observable difference between the articulation of *explicit* normative claims such as 'ethical responsibility', and the *implicit* moral and political ambiguity of these claims. Thus, under conditions of anthropogenic climate change, it seems indeed justified to remain critical of the posthumanist suggestion to erase "a perceived ontological dualism between human and non-human nature" (Hobden 2014, p. 175).

Broadly speaking, it is clear that the ethical debate about posthumanism now takes place against the backdrop of the so-called Anthropocene, a term that has been popularized by the Nobel Prize-winning atmospheric chemist Paul J. Crutzen. In short, the notion of the Anthropocene implies that the "human dominance of biological, chemical and geological processes on Earth (...) is already an undeniable reality" (Crutzen and Schwägerl 2011, n. pag.). The contentious aspect with regard to the erasure of an ontological difference between human and non-human nature is, therefore, ultimately a question of political responsibility. In view of posthumanist claims to extend our ethical responsibility and to include the environment as well as other species into our ethical considerations, we may simply have to realize that humans are already fully responsible in the Anthropocene. What is more relevant, so it seems, is to ask who currently exercises this responsibility, and how. We ('humanity') are certainly not all equally responsible.

Simultaneously, however, while debates about the ethical implications of posthumanism continue, we are reminded that the push

... to *humanize* capitalism and its neo-liberal project is having effect. In this new scenario, we must be evermore vigilant of the institutional arrangements and the colonial entanglements (Walsh 2010, p. 20; emphasis added).

As a matter of political dialectics, 'humanizing' the socio-technological systems of neoliberalism does not necessarily imply that transnational corporations are launching a charm offensive against the average citizen. Humanizing the *in*-humane tenets of capitalism such as environmental destruction, unbridled fossil fuel exploitation or rising social inequalities may as well be achieved through a gradual *de*-humanization of social theory.²⁷ In this regard, posthumanism stands accused of reducing "humans to the status of animals or machines in an instrumental, anti-humanist and potentially biologicistic or technocratic way that could erect new fascist forms of domination" (Fuchs 2009, p. 275).

The question that naturally follows is: "On what grounds, if any, can these stark accusations be justified?"

Posthumanist arguments in ethics and politics are certainly too diverse to subsume them under one major paradigm. However, what can be said about the posthumanist line of reasoning is that it emphasizes ontology, the Nietzschean 're-valuation of all values' to forge new ethical and political coalitions under a pluralist banner. Placing these hyper-

²⁷ It is well understood that the alleged boundaries between nature, technology and humanity have been rather fluid even before our ancestors used the first stone tools and wore animal skins to keep themselves warm. What I am specifically concerned with, however, are the ethical and sociopolitical implications of the widely proclaimed 'Anthropocene', not only in terms of the consequences that arise *from* changes in the Earth System, but also in relation to the human impact *on* the Earth system. In short, I advocate for an engaged ethics which focuses on the agency of technologies, nature-culture relationships, and the formation of particular technologies and technology clusters through concrete social interactions. At the heart of this engagement is the question of what constitutes the essence of 'human-nature' relations in the 21st century.

ethical demands at the heart of the posthumanist argument, and elevating an abstract *non*-human totality to a *non*-foundation of ethics, I claim, results in ethical arbitrariness based on systems thinking and empty, crypto-humanist rhetoric. Despite occasional claims to the contrary, posthumanism is still focused on the opaque subject experience of *becoming*; it is "centerless", "complex", "nomadic", and governed by the abstract paradigm of "bio-genetic capitalism" (see Braidotti 2013). One might also say, the posthuman world is governed by anxiety. Instead of furthering emancipatory attempts, I posit, posthumanist theory is still caught up in the atomism of the self-alienated and desire-driven postmodern subject. Instead of countervailing the depoliticizing tenets of a 'framegrated' and 'hybridized' modernity, it reifies them conceptually. The political and ethical way forward, however, is ironically described as a return to source – that is, to a "cosmopolitan neo-humanism" (Braidotti 2013, p. 17). It seems we can't let go after all.

Nevertheless, if posthumanist philosophy and even human rights are inherently ambiguous and prone to being misused, we may ask: What are we left with? What are the ethical alternatives? In line with the opening quote by Bruno Latour, I am convinced that a good critic is the one who assumes that if something is constructed, it is fragile and thus in great need of care and caution. And indeed, it seems as if our ethical sense of being-in-the-world is increasingly fragile and hence in great need of care and caution, while under climate change "our past is now racing toward us from the future" (Rose 2013, p. 7).

Here, we may briefly return to my earlier point about the significance of normative ambiguity in research on planetary boundaries. Overall, I claim that the mediation of the human experience *qua* technology, power and ecology necessitates to refocus our scientific attention on the sphere of the political, and especially on questions of political ontology and ethics. In this sense, I agree with some of the basic tenets of critical posthumanism. *Political ontology*, on the one hand, can be defined as the "external ground in relation to which ethical and political life gain their sense of what is right" (White 2000, p. 6). At the same

time, political ontology has to be regarded as "the study of the political stakes of the question of being" (Abbott 2012, p. 24). This turns political ontology into a good starting point for debates about transformative politics and ethics.

* * *

So how can we introduce a transformative element into our political considerations? To begin with, it is clear that Foucauldian thinking and postmodern philosophy have certainly enriched the debate on the nature of the political in the 21st century. Deleuzian philosophy, in particular, because of its emphasis on becoming, desire, virtuality and multiplicity, has been an attractive choice for many scholars focusing on ecology, modernity, capitalism and the political aspects of the digital age. Yet, values are strangely absent in a postmodern, 'nomadic' world, where everything is becoming, desire, movement, communication, stock and flow. In a truly Nietzschean tradition, Deleuzian philosophy claims "to live well is to fully express one's power; that is: to go to the limits of your own potential rather than look for non-empirical, transcendent standards to live by" (Jackson 2010, p. 32).²⁸

But what does this mean for the way we look at, for instance, climate change and risk? If 'values' are seen as purely *immanent* in Deleuzian philosophy, we have to ask whether nature in itself has no spiritual value at all? Is it only subject to the values we inscribe to it? Is nature, in a postmodern-subjectivist sense, only subject to our geoengineering because we perceive it as indeterminate, ambiguous, and risky?

²⁸ For Deleuze, *immanent evaluation* (as compared to transcendental judgement) means to evaluate forces according to two Nietzschean categories: *active* and *reactive*. The Deleuzian de-valuation of moral truth, in other words, is the direct result of a Nietzschean approach to metaphysics (see Zepke 2005, p. 245).

In a recent article titled "What's Wrong with Science and Technology Studies?" Nicholas Maxwell (2014, pp. 1; 11) engages with this metaphysical debate by acknowledging that ...

we need a new kind of science which subjects problematic aims – problematic assumptions inherent in these aims – to sustained imaginative and critical scrutiny as an integral part of science itself (...) science cannot proceed without making a very substantial and highly problematic metaphysical hypothesis about the nature of the universe.

In other words, instead of arguing over the irreducible 'Hegelian gap' we may simply have to accept our constant attempts to close it.²⁹ In order to do so, however, it is necessary to develop a transformative political and ethical imagination. Given the understandable reluctance to embrace grand societal narratives in an academic context, this appears to be an idea that many social theorists are highly uncomfortable with. Yet a mainstream political consensus slowly begins to emerge around the overarching paradigm of "transformation" (WBGU 2011, World Economic Forum 2012, Future Earth 2013, IPCC 2014b). And indeed, fulfilling the transformative task in the face of climate change requires us to extend our ethical responsibilities across territorial, generational and species barriers. In this context, the ISSC proposes that research on climate change, amongst other things, should focus on ...

issues of institutional reform, new institutional design and the building – at different levels – of structures to enable dialogue across competing interests, values and worldviews and under conditions of continued uncertainty (Hackmann and St. Clair 2012, p. 20).

²⁹ The notion of the 'Hegelian gap' refers to the radical negativity of subjectivity, including "a dimension of violence, conflict, or antagonism that cannot be eliminated in historical and socio-political experience" (Sinnerbrink 2008, p. 10).

In light of this recommendation, I intent to widen the narrow interpretation of normative sociology by understanding it as an interdisciplinary field of research that is concerned with the question of how norms and normativity emerge, change and function; and not, and that is how it is often understood, a strand of sociology that is inherently *prescriptive*. A purely prescriptive reading of normativity is not deemed suitable for this inquiry, as it seeks to formulate, for instance, what adaptation should be like. A *descriptive* account of normativity, by contrast, does not immediately compare empirical findings to normative benchmarks such as 'optimal' or 'successful' adaptation. First of all, it aims to study the multiple (path)ways in which normativity is expressed, and to examine the power effects that are related to these expressions. In other words, it tries to study what norms *are* like (and *why*) – and not what they *should be* like (Schulz and Siriwardane 2015, p. 14).

With these differences in mind, the view gets a little murkier if we turn to a purely philosophical perspective on normativity. Is a non-normative/non-prescriptive form of social scientific inquiry even thinkable? To settle the aforementioned theoretical discussions right away, I will rest my considerations on a few premises.

In a controversial discussion between philosopher Jürgen Habermas and social theorist Niklas Luhmann, the question was raised whether sociology had to contain a moral component and utopian view of society (freedom from domination), or whether it had to describe society based on a solely functional premise (Eder 1973). While Luhmann argued that the first can only be achieved at the cost of the latter, I tend to side with Zygmunt Bauman (2000, p. 216) in this argument, by assuming that ...

there is no choice between 'engaged' and 'neutral' ways of doing sociology. A non-committal sociology is an impossibility. Seeking a morally neutral stance among the many brands of sociology practiced today, brands stretching all the way from the outspokenly libertarian to the staunchly communitarian, would be a vain effort. Sociologists

may deny or forget the 'world-view' effects of their work, and the impact of that view on human singular or joint actions, only at the expense of forfeiting that responsibility of choice which every other human being faces daily. The job of sociology is to see to it that the choices are genuinely free, and that they remain so, increasingly so, for the duration of humanity.

Consequently, we need to deliberate which ethical and normative concepts may guarantee such freedom of choice. From a human rights perspective, this means to acknowledge that under climate change "defending the rights of some people or generations will mean hindering those of others" (Jamieson and Di Paola 2014, p. 110). Considering the sphere of the political, it means to realize that governing adaptation has tangible power effects, and that the principle of free choice may give rise to new governmentalities which could pass off market failures as individual or environmental risk. Unfortunately, this confronts us with another theoretical problem. If domination, in a Foucauldian sense, "is never complete, never total, never full saturating of the social order" (Brown 2006, p. 71), is there reason to believe that there is – at least to some extent – no escape from tyranny either?

A possible way to approach this problem is to consult the literature on *hegemony*. Theorists such as Antonio Gramsci, Jacques Lacan, Ernesto Laclau, Chantal Mouffe – and later, Slavoj Žižek, have engaged with the concept of hegemony and its implications. In the case of climate politics, hegemony is essentially seen to function through the discursive invocation of an antagonistic outside, for example an impending climate "apocalypse" (Swyngedouw 2010, p. 218). What is important to understand with regard to this antagonistic outside is that it is seen as an *empty signifier* in hegemony theory (Stephan *et al.* 2014, p. 67).³⁰ Empty signifiers are precisely 'empty', because they are either normatively ambiguous or completely devoid of any political meaning. In the

³⁰ The concept of the empty signifier originates from the work of Claude Lévi-Strauss, who initially used the term 'floating signifier'. However, both terms are often used interchangeably.

words of French anthropologist Claude Lévi-Strauss ([1950] 1987, p. 55) empty signifiers "represent an indeterminate value of signification". In this sense, empty signifiers function precisely in accordance with the key principle of depoliticization that has been identified by James Ferguson (1990, p. 66) in his seminal work on the *Anti-Politics Machine*, in which he states that the "state machinery has policies, but no politics". For example, empty signifiers such as the global fight against climate change may be appropriated by powerful actors and serve as a 'trojan horse' to legitimize a wide variety of *policy* interventions, while largely avoiding to engage with the contested and localized dynamics of *politics* proper.

Moreover, it follows from these debates that empty signifiers such as the global fight against climate change may render particular processes governable at a distance. *Governing at a distance* involves control over commodity processes, discourses, human bodies and the 'shadow of hierarchy' (i.e. legislative and executive decisions). Yet, since the process of governing also implies a continuous struggle for emancipation and repoliticization, hegemony must be regarded as a political project that can never be fully completed.

Cultural theorist Scott Lash nevertheless assumes that we have already arrived in a *posthegemonic* age. Lash (2007, p. 75) concludes:

Indeed, in the hegemonic order, politics was once confined to a set of more or less clearly defined institutions. After hegemony and the meltdown of the classic institutions and their regime of representation, politics leaks out. The posthegemonic order is not just an era of ubiquitous computing and ubiquitous media. It also bequeaths to us ubiquitous politics.

Ubiquitous politics blur the line between facts and values, leaving little discursive space for the re-formulation of new values and 'absolutes'. A fundamental clash of interests (*paradox*) is avoided by incorporating dissent into the grand managerial consensus. In postpolitical times,

everything becomes distanced, including ourselves. Everything becomes a matter of management. In the end, we will always get the next societal transformation, the next change 'we can believe in'. With regard to the continuous struggles between domination and emancipation, we must imagine our social context and conduct as mutually reinforcing, meandering between tunnel vision and peripheral view, between thesis and antithesis, but without a 'true' synthesis. Hybridity, ambiguity and uncertainty (risk) are the results of this "liquid modernity", where the alchemists of society have started to "melt the solids" of all social bonds (Bauman 2000, p. 4). In the name of freedom and choice, responsibility for economic and structural injustices in liberal states is increasingly pushed to the individual, resulting in a growing feeling of anomie and alienation among the population.

However, there is no need to unduly celebrate this postmodern disenchantment. Based on the assumption that the individual is fundamentally divided against itself by contradictory desires and identifications, Slavoj Žižek offers a synthesis that allows for the continuation of the rationalist political project – at least under certain conditions. Žižek (2008, p. 237) maintains that *authentic* politics is "the art of the *impossible* – it changes the very parameters of what is considered 'possible' in the existing constellation." Following this transformative line of political thought, we might then ask: how is it possible to maintain the authentic character of political exchange and utopian ideas before empty signifiers may give rise to new forms of hegemonic domination?

Posing this question at the intersection between ecology, technology and society means to first develop an idea of what exactly needs to be challenged (politically) when the notion of hegemony is invoked. Social scientists have engaged with this question through the lens of "governmentality" (Stephan *et al.* 2014), "post-politics" (Swyngedouw 2010), "neoliberalism" (Ferguson 2010, Newman 2013), "the world risk society" (Beck 2009), "technonatures" (White and Wilbert 2009), "hybridity" (Rudy and White 2014), "depoliticization" (Kenis and Lievens 2014) and "critical posthumanism" (Hobden 2014).

Given these multiple analytical frames, one of the most pressing challenges for political scientists is to re-engage with the roots of the discipline, namely the field of *political ontology*, and to critically examine the tacit assumptions that underpin methodological and epistemological choices as well as our collective reflections about being-in-the-world in a political sense. This could mean, for example, to focus on enabling conditions for authentic politics, while at the same time attempting to overcome the vexing postmodern disenchantment of social theory that currently inhibits necessary interdisciplinary exchange about the collective goals and ethical principles of social transformations under climate change.

However, one of the main lessons that can be drawn from a theoretical engagement with poststructuralism and postmodernism is that ideological hegemony, for example in the form of 'post-political' or 'neoliberal' appropriations, can never assume the form of an all-encompassing *zeitgeist*.³¹ Put differently, social behavior is never completely normalized under a dominant ideological paradigm. Thus, while being faced with a multiplicity of totalizing narratives about the effects of ideological hegemony, it is of paramount importance to move beyond the assumption that political narratives, discourses, ideas and techniques for governing 'at a distance' (i.e. *governmentalities*) readily translate into a particular set of desired societal outcomes. In reality, such attempts are typically mediated, diverted, hybridized, and distorted by diverse interests, market processes, local and transnational institutional arrangements, the physical environment, and complex processes

³¹ Accordingly, I do not seek to advance a simplistic picture of neoliberalism as an all-encompassing rhetorical symbol for cultural critique, or a monolithic ideological paradigm for globalized 'free-market' fundamentalism. Instead, in using the term *neoliberal* in the context of environmental politics, I am advocating for a nuanced understanding of neoliberalism as a way to organize territoriality through institutional processes that advance the commodification of the natural environment in line with elite financial interests (e.g. through the patenting of plant genetic resources and the logic of ecosystem services) on the one hand, and the promotion of neocolonial forms of knowledge production and political subject formation on the other.

of affect and social signification. Explaining the politics of adaptation through a single paradigm such as governmentality, neoliberalism or depoliticization therefore remains inadvertently limiting. To invoke Abraham Kaplan, we may call this the *law of the instrument*: give a small boy a hammer, and he will find that everything he encounters needs (hegemonic) pounding.

Nevertheless, the possibility of hegemonic control cannot simply be dismissed by asking: "When has humanity as a whole even undertaken – let alone controlled, still less achieved – any single explicitly and collectively deliberate end?" (Stirling 2014, p. 7). "Why hasn't it?" is what we may ask instead, if we wish to speak of hegemony.

* * *

When applying these political insights to the Ghanaian context, it can be concluded that the overarching paradigm of climate change adaptation has arrived in Ghanaian politics, and that there is increasing competition for its interpretation and implementation. Moreover, it is evident that government decentralization, privatization and structural adjustment programs have been part and parcel of externally prescribed donor agendas in Ghana since the 1980s. Evidently, these ideological influences continue to have a lasting effect on agricultural policy and economic development today, albeit in the form of more "subtle, bottom-up donor-guided mechanisms" (Mawuko-Yevugah 2014, p. 87). The rapid spread of ICT and tendencies to privatize land markets can even be observed in remote rural areas, where "globalization redefines local institutions of access to resources and realigns cultures in tandem with global production and consumption" (Yaro 2013b, p. 423). These factors indicate that the notion of liquid modernity has come to play an important role in Ghanaian society today, and that it will become increasingly important in the foreseeable future, especially under conditions of accelerating urbanization. However, while the term

liquid modernity may serve as a thought-provoking hyperbole to think about unequal socioeconomic exchange and the shift from government to 'governance', it is clear that normative social structures and command-and-control policies have not been entirely 'liquefied'.

At this point, it is the main task of empirical research to draw the final links between theory and practice. On the one hand, it needs to be ascertained what exactly occurs when supposedly hegemonic paradigms such as climate change adaptation and market-oriented policies are translated into local development contexts. On the other, it is crucial to determine how social interactions and contrasting normative interpretations of reality are mediated by institutions, power relations, priorities, and positionalities.

To recapitulate, we have seen that it is impossible to discuss the issue of climate change for very long, without arriving at the conclusion that its root causes are fundamentally related to questions of ethics, political ontology, and political economy. Yet, defining climate change as essentially *political* also means to acknowledge that, under conditions of post-normal science, climate change *as such* cannot be pinned down unless our focus of attention is placed on transforming the cultural-cognitive, normative and socioeconomic conditions as well as the institutional path-dependencies which generate the problem. A managerial and state-centric frame of reference which refers to the politics of adaptation primarily in terms of the "costs, benefits, and potential effectiveness" of (top-down) decision making (see, for instance, Javeline 2014, p. 424) thus fails to consider the asymmetric and contested power relations which "shield the essentially unsustainable network of developmental technics behind each nation and in every market" from real accountability, transparency, and social responsibility (Luke 2005, p. 236).

From an analytical perspective, it is therefore important to realize that concepts such as transformation and adaptation are *inevitably* empty signifiers, since socioeconomic and political matters of concern and calls for collective action always have to be imbued with normative

and, therefore, socially contested meanings (Schulz and Siriwardane 2015). It is precisely with these contingencies in mind, that I will now turn to the concept of power. In the following section, I will briefly introduce three concepts of power that I consider most useful for determining how institutional structures produce *subjects at risk* by mediating or expressing asymmetric social relations.

Three Types of Power

Power is not an institution, and not a structure; neither is it a certain strength we are endowed with; it is the name that one attributes to a complex strategic situation in a particular society. – Michel Foucault

What it lies in our power to do, it lies in our power not to do. – Aristotle

Power has often been referred to as an "overburdened" term, arguably taken to mean everything and nothing (Sayer 2012, p. 179). In discussing the "poverty of power", Gaventa (2003, p. 12) draws attention to the fact that despite a vast corpus of development-related literature that explicitly engages with power, the concept is rarely "defined or addressed or used in a coherent manner." In part, this ambiguity arises from the fact that the forms and exercise of power can either be theorized as being mainly agency centered (i.e., the property of power) or described as unwittingly created, facilitated, and constrained by strategic relations, social structures, and institutionalized human actions (i.e., the potential of power).

Gaventa (2003, p. 3) further argues that Foucault has arguably been "the most influential theorist of power of the late twentieth century", not just in germinating "a new genre of analysis", but also in eliciting a litany of critique. In the context of institutional change, however, a Foucauldian understanding of power may help decenter the structuredness of institutions in terms of their formal characteristics and properties such as class composition and patterns of behavior, specifically by shifting the analytical focus to the devices, concepts, meanings, values, and micropractices that characterize institutions and render them unstable (Bevir 1999, p. 352). In a Foucauldian sense, the main concern is not in *who or what* exercises power, to what degree or from where, but on *how* power is exercised, in what contexts or conditions, and to what effects (Rossi 2007, Gallagher 2008). Power, in this light, is seen as in-

trinsically productive because it creates *subjects*, which makes a Foucauldian analysis particularly relevant in interrogating projects of normativity. If power – discursive and otherwise – is seen to be based on the "multi-faceted subjectification and subject production by social norms and practices" (Brown 2006, p. 67), it also needs to be acknowledged that institutions and power relations are not necessarily synonymous with adaptation 'barriers' and 'modes of constraint'. Understanding institutional power as both, enabling and constraining can help us to define and assess 'articulations' of political questions, that is problem definitions, grievance framings, and the explicit or implicit expression of normative goals. Nevertheless, the post-Foucauldian impasse in locating power is inherently problematic, given the Foucauldian conceptualization of power and resistance as being ubiquitous, dispersed, and quotidian (Gallagher 2008, Sayer 2012).

Among more recent attempts to operationalize concepts of power in everyday practice, the so-called power matrix has been presented as a tool that helps categorize power into three interrelated forms: visible, hidden, and invisible (Pantazidou 2012, p. 17). Unfortunately, this typology reveals little about the relationality of power, particularly in terms of the flows and exchanges that determine social change. Invisible power, through its shaping of meanings and values is perhaps the category of power most relevant to exploring normative assumptions inherent to particular adaptation approaches. In a purist Foucauldian sense, however, efforts at 'unmasking' relations of power must always remain partial.

Overall, re-introducing critical realist notions of causality, emergence and structure to Foucauldian conceptions of power may offer a way out of this gridlock (Sayer 2012). In avoiding a totalizing either-or position on whether power is generated, possessed, or wielded, on the one hand, or, fluid, relational, and decentered, on the other, the focus on relationality presupposes the existence of *causation*. Arguably, then, the tracing of causal articulations in their multiplicity is requisite to

understanding adaptive processes at a more profound or 'deeper' level, that is by analyzing shifts in normative meanings. Power analysis, in other words, does not simply focus on exploring subjects and sources of power. Instead, it attempts to chart the relational flow of power and its normative implications for change. Thus, to incorporate notions of relationality, causality and normativity into a broader conceptualization of power, I distinguish between (1) power as a discourse, (2) power as the institutional organization of territoriality, and (3) power as an event. These three manifestations of the power/risk conundrum will then be used as conceptual lenses through which institutional life and the sociopolitical dimension of risk can be assessed.

Creating Subjects at Risk: Power as a Discourse

To study the discursive dimension of power, I will draw on the so-called Sociology of Knowledge Approach to Discourse (SKAD) which has been developed by Reiner Keller. SKAD combines social macro theories of discourse that are rooted in the work of Michel Foucault, Ernesto Laclau and Chantal Mouffe with the sociology of knowledge tradition that is commonly associated with the work of Peter L. Berger and Thomas Luckmann (Keller 2005, p. 2).³² According to SKAD, the notion of *discourse* refers to "performative statement practices which constitute reality orders and also produce power effects in a conflict-ridden network of social actors, institutional dispositifs, and knowledge systems" (Keller 2011, p. 48). Due to the complexity of this definition, I will briefly contextualize the conceptual background of SKAD, before I discuss how it can be operationalized to assess notions of power and risk.

³² Although Reiner Keller distances himself (and SKAD) from the hegemony theory of Laclau and Mouffe in his later writings (see Keller 2011, p. 47), I consider it analytically fruitful to maintain a critical relationship between the two traditions.

The 'sociology of knowledge' approach of Peter L. Berger and Thomas Luckmann, which is underpinning the SKAD perspective, is firmly rooted in the early tradition of sociological institutionalism and normative sociology. In their seminal work on the "Social Construction of Reality", Berger and Luckmann (1966) specifically draw on the Mead-Blumer tradition of symbolic interactionism to illustrate how representations of 'objective' and 'subjective' reality are constructed through the interplay between ideational and material processes. In this sense, SKAD is not only highly compatible with the cognitivist interpretation of normative sociology that I have outlined earlier in this chapter – rooted in the *cognitive order* of society and a naturalistic-dialectical view of a "situated reason" (Strydom 2011, p. 69; Keller 2011, p. 50). It is also well suited to explore the institutional dimensions of these social ordering principles.

However, what has arguably been neglected in the Berger and Luckmann tradition of sociological institutionalism is the development of a specific theory of power and discourse (Keller 2011, p. 46). Therefore, SKAD draws on the work of Michel Foucault as a starting point for a deeper exploration of the relationship between power and contested discursive practices. In particular, the focus of SKAD rests on the "analysis of symbolic order on institutional and organizational levels and arenas as well as the effects of such an ordering in different social fields of practice" (Keller 2005, p. 7). In other words, SKAD gives a prominent role to "institutions as temporary 'crystallized' or 'frozen' processes of ordering' (...) which enable and constrain individual action", while at the same time assuming "that social actors are not puppets on the strings of discourse, but (...) creative agents engaged in social power plays and struggles for interpretation" (Keller 2005, p. 5). Discourses are not simply understood as collections of texts, speeches and pictures, or seen as institutionally embedded 'containers' for ideas. Instead, they are defined as productive social and material practices which incrementally constitute the *subjects* they refer to. In this respect, discourses can be both, the cause and effect of social action.

Consequently, in order to better comprehend how determined relations between discursive articulations and concrete power effects are established, SKAD suggests to concentrate on frames of *problematization* (Keller 2011, p. 46). This means to engage in an analysis of discursive-material practices to understand how discourses are used by particular actors to justify decisions and mobilize social action. We might, for instance, think of *risk* as "the way organizations make sense of their environment and act upon it" (Ericson 2007, p. 11). In the context of adaptation, risk has become an important discursive paradigm which governs the organization of "relevant" knowledge in scientific and political debates (IPCC 2014b, p. ix). The multiple ways in which risk – and therefore implicitly hazards, exposure, vulnerability and adaptive responses – are discursively articulated is a crucial aspect that determines how power takes effect. The rationale behind this discursive-material understanding of power is the simple fact that "language matters deeply for analysis, interpretation and action" (Ribot 2011, p. 1160). Dominant discursive paradigms directly affect and transform social reality, for instance by framing and contextualizing causality, and in defining what is considered risky and who or what is at risk. Furthermore, in communicating risk, monitoring risk, and by directing organizational strategies and resources, discourses also provide interpretations of circumstances and appropriate means that constitute political claims for action (Schulz and Siriwardane 2016, p. 176). In this sense, discourses are more than language, since the 'objective truth' about risk is created through shared normative definitions of reality, but not independent of contextual circumstances and practices.

Yet, while the SKAD perspective acknowledges that hegemonic struggles over normative meanings and paradigms are an inevitable fact of social life, it seeks to overcome some of the practical challenges that the Foucauldian and Laclau/Mouffe traditions are facing in terms of applying discourse analysis as a concrete research tool. To be precise, the goal is to countervail a certain empirical bias or determinism which might trouble concepts of hegemony and evoke simple dichotomies

between power as negative and resistance as positive. It can be argued, for instance, that an empirical approach to the study of discursive hegemony may not yield many new insights, because the theorist always seems to know in advance "how ideology works" (Keller 2005, p. 3). In acknowledging these shortcomings, SKAD proposes several analytical concepts and tools that can be used for discourse analysis (Keller 2013, p. 115; Ullrich and Keller 2014, p. 124-125). In the following, I have selected and re-combined four key elements of the wider SKAD repertoire that I consider most relevant for the assessment of adaptation discourses in Ghana:

1. As a first step, I deem it necessary to identify overarching *interpretative schemes* that govern relevant discursive formations. In this study, I will focus on overarching notions of risk and climate change adaptation.
2. The second analytical step concerns the identification of *discursive classifications*. Based on a comprehensive review of the adaptation literature, I have identified dominant classifications of adaptation that simultaneously relate to four institutional pathway scenarios: (1) adjustment, (2) reform, (3) transformation, and (4) business-as-usual.
3. The third step focuses on the *phenomenal structure* of the selected discursive classifications. This means to delineate specific cause-effect arguments about risk and the need to adapt to climate change, including the definition of problem dimensions, action alternatives, consequences, and value-implications, for example with regard to the interpretation of nature-culture relations. In other words, I intend to explore how problematizations of risk relate to the aforementioned classificatory categories of adaptation, and how specific problematizations that are expressed in interview or policy statements might possibly relate to (or differ from) these categories in their normative underpinnings and narrative structures.

4. In addition, the narrative approach will be combined with a *dispositif analysis* to determine how adaptation discourses are embedded in specific historical contexts and institutional arenas, and to illustrate how these arenas are in turn defined by actors' positionalities and dynamic relationships between materiality and social signification. Here, the focus rests on the *relational* dimension of risk and the institutional organization of territoriality.

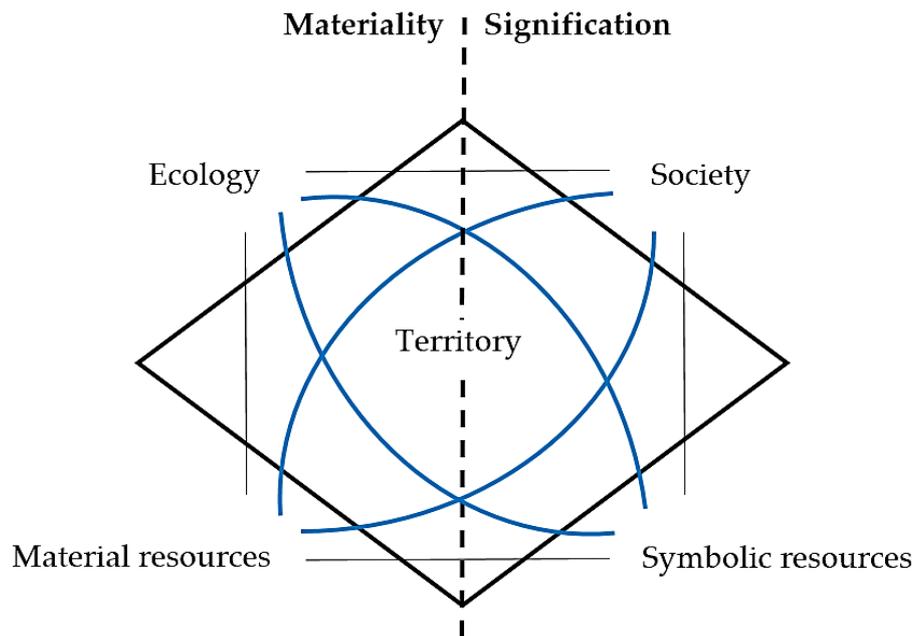
*Relational Risk: Power and the Institutional
Organization of Territoriality*

The contextual aspect of discourses, or the more-than-language dimension of discursive production, is referred to as the so-called *dispositif* in Foucauldian terms. The *dispositif* describes the material, practical and institutional "infrastructures" on which discourses rest (Keller 2008, p. 101). Rule-based incentives, opportunity structures and material as well as symbolic resources for articulation that are put in place "to solve a problem" are thus an integral part of the *dispositif* (Keller 2011, p. 49). For example, we may consider the organizational structures of the Ghanaian climate change adaptation arena as part of the *dispositif* to manage social risk and solve the problem of adaptation. The adaptation *dispositif* thus determines how adaptation 'solutions' or interventions are carried out, and who can legitimately and effectively articulate a discursive position within a given institutional context.

Thus, to explore how *subjects at risk* are created, it is vital to analyze the adaptation *dispositif* and focus on the hybrid relationships between processes of social signification on the one hand, and the concrete materiality of landscapes and resource flows on the other. The primary process through which both realms of human action – social signification and constructed materiality – enter into a hybrid relationship will be defined as the *institutional organization of territoriality*. For example, even though climate-related hazards such as floods and droughts

occur across West Africa, the concrete impacts of these risks are experienced in different ways by individuals based on their relative exposure, vulnerability and adaptiveness. Based on the assumption that unmediated natural risks do not exist, it is evident that exposure, vulnerability and adaptiveness are significantly shaped by the institutional organization of territoriality. Who or what is at risk – or perceived to be at risk – crucially depends on how material and symbolic resources are valued, mediated and channeled by institutions. It can therefore be concluded that the institutional organization of territoriality is at the same time defined and mediated by hybrid forms of social signification and materiality that transcend time and place.

Figure 3. The Institutional Organization of Territoriality



(Schulz and Siriwardane 2016, p. 177)

Furthermore, to map the multiple ways in which the institutional organization of territoriality takes effect and creates subjects at risk, this study presumes that the dispositif for adaptation is not only defined

by discursive and material problem-solution patterns, but also determined by processes of territorial *boundary-making*. Risk thus has to be seen as inherently politicized, because the institutional organization of a given social territory inevitably proceeds in a way that privileges some actors or ideas over others. In addition, the institutional organization of territoriality also demarcates different domains of risk by generating insider-outsider relations. This nuanced understanding of institutional territorialization helps emphasizing the social production of risk by maintaining a strong focus on discursive articulations, speaker positions, and material factors that enable or constrain adaptiveness relative to a particular setting and normative agenda (Schulz and Siriwardane 2015). However, as important as these broad-based relational aspects of risk may be, it is still essential to consider specific causal relationships that can only be fully understood if the *situatedness* of risk is taken into account as well, and if locally distinct manifestations of risk are thoroughly investigated.

Situated Risk: Power as an Event

In the previous two sections, I have outlined how power is expressed through discourses and their related dispositifs. I have also illustrated that analyzing the institutional organization of territoriality is a useful starting point for conducting an assessment of the political adaptation 'arena' in Ghana. However, to avoid getting bogged down in endlessly complex relationships between inter-dependent and multi-layered institutional structures while assessing the social production of risk, it is necessary to 'work backwards' and also consider the situatedness – that is, the event-related dimension of risk. Working backwards from an event, in this sense, means to assess situation-specific social impacts to deduce more reliable information about cause-effect and instrument-achievement relations that determine how risk is socially produced. Case study research can contribute substantially to this endeavor, ex-

plicitly by shedding light on locally diverse manifestations of risk perceptions and risk exposure. Granting that isolated observations do not easily lend themselves to generalization, a case study approach may nonetheless be useful in exploring causal relationships between locally experienced hazards and dynamic states of adaptiveness.

However, although scholarly attention to hegemonic discourses and power relations is slowly increasing in adaptation research, there is relatively little empirical work available that deals with cause-effect and instrument-achievement relations in cases where power is exercised. While being immersed in 'the field' researchers may rather find that responsibilities are often dispersed and allegedly powerful political actors may feel powerless when it comes to the implementation of adaptation policies that have been devised at the drawing board. More often than not, policy mainstreaming and implementation takes place in 'messy' institutional environments that are characterized by processes of creative politicking and self-interested appropriation. Many socio-economic and political interventions that are seeking to strengthen adaptiveness are in fact hampered by a lack of resources and deeply engrained institutional lock-ins, which makes adaptation a daunting task.

Nevertheless, assessing specific cause-effect and instrument-achievement relations does not necessarily mean to deploy a prescriptive logic of organizational efficiency which aims to measure social outcomes against the backdrop of normative benchmarks for successful adaptation. Rather, it needs to be examined under which circumstances one may actually speak of a tangible institutional influence on the social production of risk.

Following Maxwell (2010), this study therefore rejects a hierarchical and dichotomous relationship between statistical variables and their context and draws on both qualitative (event-related) as well as quantitative (survey-based) research methods to determine how institutions causally influence the social production of risk. The goal of this

"mixed-methods" approach (see Johnson *et al.* 2007) is to present a multifaceted account of risk that is based in the 'subjective' dimension of risk (social signification) on the one hand, and the 'objective' dimension of risk (the materiality, probability, magnitude and frequency of risk) on the other. Moreover, while some theorists have argued that such a combination of interpretivist and realist epistemologies is contradictory in essence, I argue that an integrated research design is not only useful in testing causal theories from multiple perspectives, but also epistemologically commensurable with an account of normative sociology that is rooted in the *cognitive order* of society and based on notions of *situated cognition* and knowledge(s) (Solomon 2007; Strydom 2013).

What is arguably still needed, then, is an overarching analytical framework that is able to accommodate a mixed-methods research design based on the previously described three 'faces' of the risk/power conundrum (discourse, relational risk and situated risk) in a wider risk assessment context. The following section seeks to provide such an overarching risk assessment framework and to develop a forward-looking approach to adaptation by introducing the notion of institutional adaptation pathways.

Institutional Adaptation Pathways and Scenario Planning

Integrating notions of institutional change into risk assessments is a difficult task, particularly because attempts at framing institutions within adaptation scholarship have been fraught with the same conceptual challenges that NIE and NI have been grappling with. These challenges include the question of how trajectories of institutional

change can be theorized, to what degree they can be meaningfully influenced, and how the problem of defining criteria for the selection and weighting of institutional influences on adaptation processes can be solved in the context of *multi-hazard risk assessments* (MRAs). In adaptation research, the definitional criteria of institutions are almost exclusively derived from NIE and NI, and tend to be relatively uniform. Gupta *et al.* (2010, p. 460), in employing a definition issued by the *Institutional Dimensions of Global Environmental Change* (IDGEC) program, define institutions as "systems of rules, decision-making procedures, and programs that give rise to social practices, assign roles to the participants in these practices, and guide interactions among the occupants of relevant roles." Similarly, Agrawal and Perrin (2009, p. 351) conceptualize institutions as "humanly created formal and informal mechanisms that shape social and individual expectations, interactions and behavior." Arguably, these definitions are representative of a minimal consensus in environmental change research in terms of defining institutions (see Adger and Kelly 1999, Young *et al.* 2008, Dovers and Hezri 2010).³³

Defining institutions in largely managerial terms – as rules, programs, mechanisms and decision-making procedures – nevertheless conveys a strong sense of institutional 'design-ability' and "cockpit-ism" (Hajer *et al.* 2015). Ever since the emergence of the adaptation debate, a major strand of adaptation research has focused on the "human ability to get institutions right" through managerial and organizational fixes, based on the goal to either develop or strengthen adaptiveness (Cleaver 2012, p. 1; Obeng and Agyenim 2013, p. 193). The nomenclature of international development is no different in its managerial discourse rife with

³³ A notable exception in adaptation scholarship are the three structural dimensions proposed by Pelling and Manuel-Navarrete (2011, p. 2), who distinguish between *structures of legitimation* (norms and rules that regulate social interaction and enforce conformity), *structures of domination* (control over mechanisms determining resource distribution in society and symbolized by centers of authority), and *structures of signification* which produce interpretations or meanings that are used to make sense of experience.

metaphors of institutions as organizations. Institutions are taken to be purpose-led and steerable entities, with the ability of 'doing' things such as "balancing the interests of the different stakeholders" and being capable of credibly implementing solutions they propose (Hallegatte *et al.* 2011, p. 15). It can be argued that these perceptions of institutions still linger on the very surface of self-referential managerial structures, which are theoretically disembedded from their wider social context. The degree to which social institutions are malleable and can be steered as uniform entities must therefore be carefully assessed on a case-by-case basis.

Yet, it is evident that contemporary debates about risk assessments still rest on teasing out the wrong variables, indicators, baselines and benchmarks from the right, whereas aspects such as cultural values, norms, power relations and discourses which shape institutional life in all its diversity have received far less attention. As I have shown in great detail throughout this chapter, it has become sufficiently clear that these analytical blind spots are likely to have tangible consequences for the implementation of adaptation actions, and may be increasingly problematic for individual as well as collective efforts to increase adaptiveness. As Dryzek (1996, p. 122) maintains: "Formalists who hope that supportive discourses will simply fall into place once the [institutional] hardware has been established are likely to be disappointed". Arguably, this means that technological fixes, short-term policy interventions and top-down approaches to organizational design are less likely to be successful in instigating the long-lasting normative and cultural-cognitive changes that are required to reform/transform social structures against the backdrop of anthropogenic climate change (Schulz and Siriwardane 2015).

For example, recent studies on the historical dimension of transformative change testify to the fact that social transformations are in essence related to the co-evolutionary development of institutional arrangements, technologies, and normative as well as cultural-cognitive pat-

terms of meaning-making.³⁴ Occasionally these co-evolutionary processes of social change proceed in a more incremental fashion, while in other cases they materialize as abrupt changes between different social equilibria. Whatever may be the case, the key question that needs to be answered is how the richness and diversity of institutional life can be properly accounted for in the context of MRAs.

While I have already outlined a methodological approach to analyze the risk/power conundrum from an institutional point of view – specifically in drawing on notions of discourse, relational risk and situated risk – the pathways approach is more concerned with the question of how the interaction between these aspects may limit or enable institutional responses to risk in the future, particularly in relation to people's livelihoods and adaptiveness. Overall, possible institutional pathways may align with discursive classifications of adaptation as adjustment, reform or transformation, or follow other local visions of social change, including business-as-usual scenarios. What is most important from a pathways perspective, therefore, is to discern how institutional processes are influencing adaptive and maladaptive responses, and to investigate how biogeochemical and social change over time determine 'adaptive space' and room for agency or maneuvering.

Instead of drawing on the common problem-solving mode of organizations rooted in "ever more sophisticated risk analysis techniques and management approaches", a pathways approach seeks to "expose, test, deepen, and clarify" those interpretative frames and shared understandings of the social world that are needed to make responsible and transparent decisions about collective actions for adaptation (Wilkinson and Kupers 2014, p. 76). In other words, a pathways approach seeks to assess the social ordering principles that govern the production of risk, and aims to identify *trends in risks* in order to "not only respond to past conditions, but anticipate what may be coming" (van Aalst *et al.* 2008, p. 173).

³⁴ For a summary, see Jacob *et al.* (2012). Also see Schulz and Siriwardane (2015).

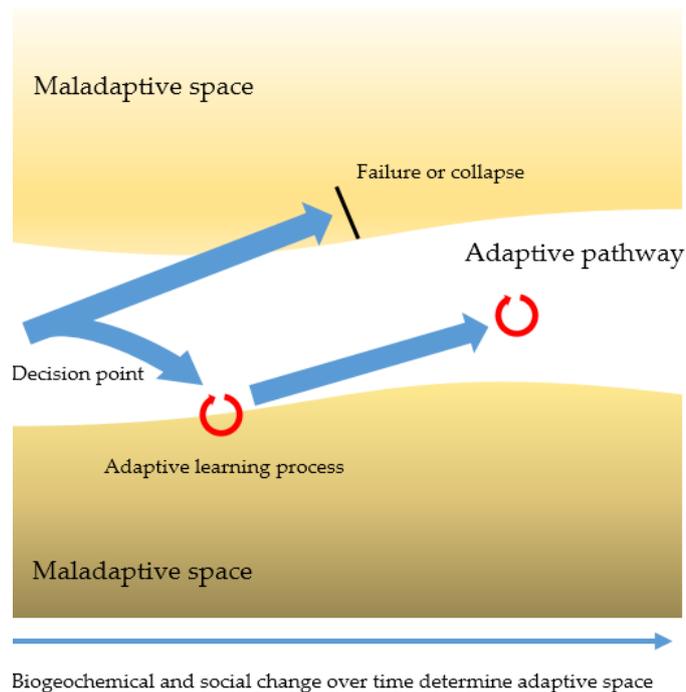
However, as it may be difficult to deduce particular trends in risks from locally contingent risk perceptions and uncertain projections of future social impacts, an institutional emphasis within the adaptive pathways frame seems to be a useful conceptual extension for MRAs. Since deeply engrained normative ambiguities and institutional lock-in effects might restrict adaptive pathways at different levels of society, viewing risk assessments through an institutional lens may help in shifting the focus of analysis on enabling structural conditions for adaptation and 'authentic' political engagement.

Today, a common methodological response to the aforementioned challenges posed by MRAs is to combine quantitative methods with qualitative approaches that are frequently used by anthropologists and development researchers. Qualitative approaches in development studies and anthropology are typically based in *Participatory Learning and Action* (PLA) methods such as transect walks and risk mapping, asset inventories and livelihood surveys, cropping and rain calendars, oral histories, group meetings or discussions, as well as key informant interviews (van Aalst *et al.* 2008, IIED 2009). What is common to these PLA methods is a strong focus on social relationships that are not predominantly shaped by managerial and utilitarian ways of thinking and interacting. However, as economic relationships are indubitably a central part of everyday life, PLA methods also include economic perspectives based on the notion of *archetypal livelihoods*. The idea of archetypal livelihoods, according to van Aalst *et al.* (2008, p. 175), implies that "a relatively large number of people's livelihoods can be assessed through the analysis of relatively few 'economic activity combinations' that are based on the possible archetypal livelihoods of that area."

Nevertheless, it is important to keep in mind that multidimensional risks frequently extend beyond the narrow scope of economic and communal life and continue to raise normative questions about institutionally entrenched power relations. Thus, I consider it necessary to combine PLA methods with more forward-looking ideas based on the notion of "pathways to adaptation" (for an overview, see Eisenhauer

2016). Approaching the idea of contested adaptation pathways from an institutional perspective, in particular, yields tangible benefits in terms of connecting the discursive, relational and situational aspects of risk. An institutional pathways perspective takes into account that adaptation actions must be informed by a critical analysis of how the risks and adaptive spaces of the future are imagined in a normative sense, and how institutional processes and political decisions of the past and present continue to shape the very boundaries of adaptive trajectories. Exploring individual or collective positionalities and decision points vis-à-vis certain adaptation pathways thus enables a clearer view of how adaptive trajectories are institutionally embedded, and how they are historically, spatially and temporally evolving.

Figure 4. Institutional Adaptation Pathways



(Source: author, also compare Wise *et al.* 2014, p. 326)

The extent to which the future can be imagined – let alone effectively managed – nevertheless remains a pertinent question in the context of adaptation planning and decision making. Inevitably, decisions do not automatically lead to desired outcomes. Moreover, adaptive or reflexive organizational learning with the goal to make informed and responsible decisions usually requires openness and the integration of a wide variety of different types of *knowledges*. This includes positivist as well as interpretivist frames of reference which are often not easy to combine, as I have discussed very extensively in the first half of this chapter. On a whole, anticipatory scenario techniques are still very marginal in adaptation planning compared to predictive models that are framing adaptation "as a form of rational evidence-based risk management" (Rickards *et al.* 2014, p. 654).

In Ghana, however, the so-called *Akropong Approach* offers a unique entry point for scenario planning since it includes both imaginative as well as a calculative aspects. The *Akropong Approach* has been developed and used for adaptation planning and cross-sector analyses, and works with scenarios that include

(...) a qualitative, storytelling component, and a quantitative component. The quantitative component may include a formal model or may show indicative figures based on anticipated developments or comparable historical situations (Kemp-Benedict and Agyemang-Bonsu 2008, p. 835).

In augmenting the cross-sectoral outlook of the *Akropong Approach*, I will concentrate on a limited number of scenarios: (1) adjustment, (2) reform, (3) transformation, and (4) business-as-usual. The main goal is to explore possible *institutional adaptation pathways*, and identify scenarios that are most likely to occur, taking into account the "interactions between events or trends that have been identified as key to the development of the system under study" (Kemp-Benedict and Agyemang-Bonsu 2008, p. 834).

However, the main analytical pitfall that needs to be avoided in this regard is the excessive use of *quantitative models* and statistics to inform future adaptation scenarios. In other words, primarily relying on calculative models to inform qualitative 'futuring' strategies such as joint stakeholder workshops might provoke different forms of cognitive bias among participants and decision makers. This includes tendencies to search for or interpret predictive scenario-related information in a way that confirms one's preconceptions, and to regard future options that are based on numeric information or quantifiable probabilities as more objective. The notion of institutional adaptation pathways, as I have described it, thus offers an additional perspective on scenario planning by focusing on the existing and *empirically traceable* structural aspects of social change to describe possible institutional adaptation scenarios. Accordingly, the four pathway scenarios are shown below.

Figure 5. Range of Institutional Pathway Scenarios

Scenario A "Adjustment"	Scenario B "Reform"
Scenario C "Transformation"	Scenario D "Business-as-usual"

Analytical Framework

A basic question that has to be answered for the development of a holistic analytical framework is how complexity can be reduced without losing analytical precision. As uncertainties persist and normative framings of adaptation options need to be explored, new forms of analysis are required which take into account political power asymmetries and the wider socio-territorial context in which adaptive trajectories unfold.

The frame of reference that is adopted in this study is rooted in an *institutional pathways approach* and combines methods of qualitative and quantitative inquiry. In sum, the analysis focuses on three core research goals. Each research goal includes particular subsets of specific research questions and methods in order to test the following hypothesis based on empirical data: *"Institutions are the primary factor that determines social vulnerability in the research area."*

Research Questions and Methodology

The institutional pathways approach: three core research goals

1 – *Tracing official adaptation discourses and expert perceptions of risk from the national to the local level*

The first analytical goal is to explore how discourses on adaptation are changing across scales, and how policy translation from the national to the local level plays out in practice. Normative framings of risk are compared to four institutional pathway scenarios: (1) adjustment, (2) reform, (3) transformation, and (4) business-as-usual to test emerging connections between these scenarios and available empirical data.

Related research questions:

1. How are adaptation-related risks defined and prioritized by government officials and academic specialists as well as international NGOs and development agencies? And in how far do normative definitions, perceptions and prioritizations of risk change from the national to the local level?
2. How is adaptation perceived by Agricultural Extension Agents (AEAs) who work directly with farmers in the research area? What are the most widely applicable adaptation options?

Research methods:

Semi-structured interviews and group discussions: semi-structured interviews (n=15) as well as several informal discussions with government officials, academics, adaptation policy consultants and staff members of international donor organizations have been conducted at the national, regional, and district levels to assess how notions of climate change adaptation and risk are discursively framed in different managerial contexts (see [Annex 1](#)). In addition, a group discussion with AEAs (n=12) has been carried out to assess how the concept of adaptation is perceived by professionals at the Ministry of Food and Agriculture who work directly with farming households.

Structured interviews with key specialists: structured interviews were conducted with NADMO district coordinators (n=13) as well as AEAs (n=12) working in the Veja Catchment area to elucidate various perceptions of risk and explore climate change adaptation options.

Participation in stakeholder meetings: participatory research in the context of civil society stakeholder meetings prior to the establishment of the NCCP has been conducted to gain further insights into stakeholder dynamics during the policy development process.

Discourse analysis: drawing on the Sociology of Knowledge Approach to Discourse (SKAD), an in-depth analysis of core policy documents and key specialist interviews has been performed. The main analytic goal is to assess normative interpretations of risk across a wider spectrum of adaptation-related policy areas to determine how definitions and priorities may change across scales.

2 – Conducting a multi-hazard risk assessment in the Veia Catchment area

The main goals of the MRA include (a) an assessment of the economic situation of local households, (b) an assessment of the social, institutional and physical environment in which households are embedded, and (c) the identification and evaluation of risks and risk impacts. In order to perform this task, research assistants were hired locally.

Related research questions:

1. How do households in the research area perceive risks? What are the relevant institutional determinants of risk?
2. How *exactly* do institutions shape the vulnerability of households with regard to these risks? Are there perceivable differences between rural and urban households, and between subsistence and commercial farmers?

Components of the multi-hazard risk assessment:

Household interviews: using a mix of quantitative survey techniques and open-ended questions, household interviews (n=484 HH) were carried out in the following communities in the research area: Veia-Gunga, Yikene Adohbisi, Zaare Amoabisi, Namoo-Akunka as well as Bolgatanga-Sawaaba and Bolgatanga-Damweo. Additional interviews have been conducted with commercial farmers at the Veia irrigation project. This selection of field sites allowed for a direct comparison between different farming and irrigation practices as well as between small-

scale subsistence farmers, commercial farmers, and non-farm households. Moreover, the portfolio of livelihood activities in the research area has become moderately diverse over time. Hence it has been possible to analyze risk distribution, both spatially and socially, among rural and urban populations with moderately *diversified* sources of income.

PLA methods: facilitated group discussions have been held in Veá with two separate groups (a men's group with the chief of Veá and his elders, and a women's group). Food security and seasonal rainfall calendars have been prepared to learn more about participants' perceptions of risk.

3 – *Analyzing relational risks* (cross-cutting/integrative component)

The third analytical goal concerns the identification of relational risks and institutional barriers. The main aim of this cross-cutting task is to explore whether there are empirically traceable points of divergence between empirical findings and managerial policy narratives. Furthermore, this component of the MRA is concerned with the impact of institutional territorialization processes on possible adaptation pathways. In order to determine the framework conditions for change from an institutional point of view, special emphasis is given to dynamic power relations and institutional interactions across scales.

Related research questions:

1. How exactly are institutional territorialization process taking shape?
2. How do institutional factors converge across scales to create *subjects at risk*? At which point are exclusionary social processes created, and how are they relevant for the adaptiveness of households in the research area?

3. How do the empirical findings of the MRA compare to organizational discourses about climate change adaptation and risk? What are the policy implications?

Research Methods:

Analysis of institutional territorialization processes: qualitative field research has been carried out to evaluate socio-spatially situated risks and illustrate the complex interactions between risk exposure, hazards and the institutional organization of territoriality in the Veia Catchment area. Illustrative examples include the case of the Veia irrigation project, as well as changing patterns of reciprocity and communal solidarity that are mediated by social institutions.

Data triangulation: the cross-cutting component of the MRA draws on secondary data such as aggregated statistical macro data, journal articles, grey literature and conference materials in order to triangulate empirical findings by evaluating different data sources.

The Veia Catchment as a Field Site

The selected field site for the MRA is the Veia Catchment in the Upper East Region of Ghana (UER), which is also one of the designated focus areas of the WASCAL core research program. The Veia Catchment is situated in the West African Sudanian Savanna zone between latitudes 10° 45' to 11° 00' north and longitudes 0° 45' to 0° 56' west, covering about 235 km² and stretching through two administrative districts, the Bongo District and the Bolgatanga Municipal District (Eickhof 2010, p. 6). Bolgatanga, the regional capital of the UER, is located in close proximity to the Veia Catchment, and will be the focus area for the urban subcomponent of the MRA. The main occupations in the area are subsistence and cash crop farming, hunting, weaving, brewing and agroforestry. Livestock rearing includes sheep, goats, cattle, pigs and poultry such as guinea fowl. Land holdings are usually very small, a little

over 1.9 hectares on average, and plots are often scattered (DPCU 2010, p. 10). In the Bongo District, 71.6 percent of all households are engaged in agriculture, while the percentage in the Bolgatanga Municipal District is slightly lower at 67.1 percent.³⁵

Rural farming systems in the catchment area are centered around small compound farms. This particular type of smallholder agriculture is mostly rainfed and primarily based on traditional staple crops such as early millet (*nara*), late millet, maize, and guinea corn. Commercial farming is concentrated around two major irrigation schemes which allow for the cultivation of crops and vegetables during the dry season: the Tono project near Navrongo and the Vea dam project near Bolgatanga (GSS 2013, p. 4). The main cash crops that are cultivated in these irrigated areas are rice and tomatoes.

During the dry season, farming activities in the catchment are centered around rivers and small water bodies, where pump irrigation and bucket irrigation are practiced. Other irrigation techniques that are used outside of larger irrigation projects are based on the use of wastewater and the abstraction of groundwater through boreholes and wells. Typically, most smallholder farming activities must be carried out during the single rainy season in order to meet the food requirements for the year. As this is normally not achieved, communities and individuals are pressed to find additional coping mechanisms to meet their basic needs in an increasingly unpredictable socioeconomic and physical environment (Quaye 2008, Gyampoh *et al.* 2009, Dasgupta and Baschieri 2010). In addition to irrigation, common adaptation strategies that are used by farming households during the dry season include the changing of planting dates and crop varieties, water storage for vegetable farming and the construction of dugouts during drought periods (Ofori-Sarpong 2001, Barry *et al.* 2010, Nakuja 2012).

³⁵ Data Source: Ministry of Food and Agriculture and Ghana Statistical Service. Dataset from 2012. Calculations by author.

Farm households also rely on informal credits and other traditional systems of reciprocity, and seek to diversify their income through non-farm activities such as hunting, fishing, weaving, brewing, shea butter processing and petty-trading (Schulz and Siriwardane 2016, p. 181).

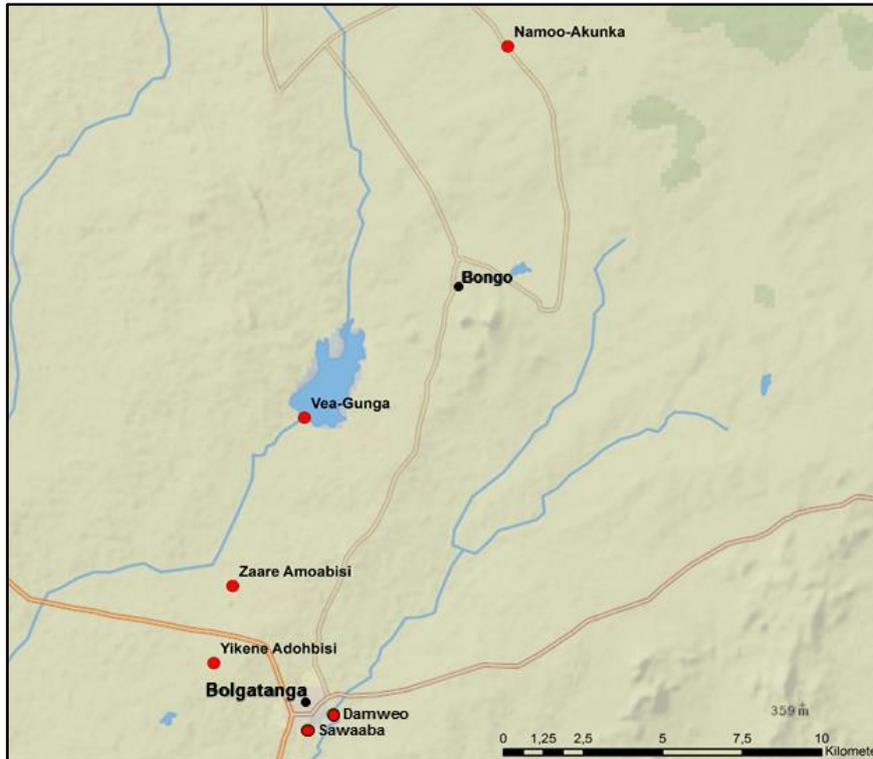
The table below gives an overview of a larger variety of crops and vegetables that are grown by commercial farmers and households in the catchment area.

Table 4. Agricultural Production at Field Sites

Dry season farming (November until April)	Rainy season farming (May until October)
Rice (c)	Rice (c)
Maize (b)	Maize (b)
Tomatoes (b)	Tomatoes (c)
Kenaf (b)	Kenaf (b)
Okra (b)	Okra (o)
Amaranth ('aleefu') (b)	Amaranth ('aleefu') (o)
Chili ('pepper') (b)	Chili ('pepper') (b)
Beans (o)	Groundnuts (b)
Onions (b)	Beans (b)
Sugarcane (c)	Late Millet (o)
Shea nuts (c)	Early Millet (o)
	Guinea-corn (b)
	Sweet potatoes (b)
	Lettuce (o)
	Shea nuts (c)

(o = mostly for own consumption; c = mostly commercially; b = both, commercially and for own consumption; data based on household interviews, n=484)

Map 3. Field Sites

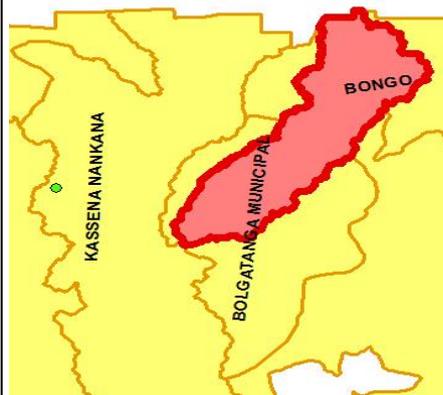


Legend

- Field Sites
- District Capital

Authors:
 K. Schulz, B. Fissmer, N. Bamler
 Center for Development Research (ZEF)
 Scale: 1: 135.000
 Data Source: Base Map
 (National Geographic)
 September 2013

Veja Catchment Area



Field Research Approach

To allow for a more targeted field research approach, a number of institutional processes and 'gatekeepers' that mediate access to livelihood resources have been identified before collecting quantitative as well as qualitative household-level data in the Veve Catchment area. The process was supported through semi-structured expert interviews in Accra and Bolgatanga (n=15) that took place from July until December 2012 (for a complete list, see [Annex 1](#)). The key goal was to identify institutions which potentially exert the greatest influence on the vulnerability of households, and to include a variety of actors from different sectors of society based on an iterative approach. The findings of this preliminary evaluation process are summarized in the table below.

Table 5. Institutional Mediation of Household Access to Resources

Access to:	Provision	Mediating Factors
Decision-making processes	Politicians; state administration; religious/traditional authorities; influential individuals (business people, farmers)	Elite, patronage and kinship networks; group affiliations; party membership; organizational structures
Financial capital	Banks; remittances; labor market; informal loans; income diversification through non-farm activities	Social networks such as groups and associations; information and education/training; access to natural resources; migration and market dynamics; collaterals

Land	Inheritance or kinship; traditional authorities (earth priests); formal and informal leasing; irrigation authority; emerging land markets	Gender-based norms; socioeconomic status; insider-outsider dynamics (group-based, ethnic, kinship); village committees
Agricultural services and inputs	MOFA, ICOUR, input dealers, (I)NGOs, agro processors, wealthy farmers	Social networks and AEAs, especially for subsidies and machines; public investment; private investment and market dynamics
Markets and value chains	Agribusiness and processors; private merchants; irrigation company; MOFA; Government	Public policies and investments (infrastructure), private investments; access to natural and social capital (elite networks, education and information); market dynamics
Health care	Public clinics (National Health Insurance Scheme); private clinics; traditional healers	Financial resources; social networks
Household water	Pumps and boreholes, public water bodies such as rivers and lakes, pipe-borne water	Water communities; negotiation among water user groups; user fees

CHAPTER THREE: TRACING ADAPTATION DISCOURSES FROM THE NATIONAL TO THE LOCAL LEVEL

The third chapter draws on select analytical methods offered by the Sociology of Knowledge Approach to Discourse (SKAD) to illustrate how climate change adaptation is discursively framed by adaptation specialists and practitioners at different levels of society. Based on quantitative survey data and semi-structured interviews, the overarching goal is to provide a broad-based overview of relevant adaptation discourses in Ghana. The analysis focuses on the issue areas of adaptation financing and mainstreaming, disaster risk reduction and early warning systems, as well as on the delivery of agricultural extension services. Particular attention is paid to the organizational and technological infrastructure on which contested adaptation discourses rest (the so-called *dispositif*). Findings show that current attempts at increasing the adaptiveness of farmers and government organizations are fundamentally constrained by the persistent quandaries of resource lack and unfinished decentralization. It is also argued that the resulting politics harbor the danger of neglecting pro-poor adaptation in favor of predominantly market-driven approaches with a strong focus on large-scale agricultural production.

Funding Priorities under the National Climate Change Policy

I don't care if it's climate change or green men from Mars ... if we can do something that will increase the ability of the people of Ghana to respond to difficulties in whatever form, that is what I consider development ... climate change, in that respect, is an opportunity to speed up some of the development processes which may not have been on the radar of the politicians if it was not for the fact that there is money sitting somewhere. I think that is the basic error in this whole structure which is climate change adaptation: people adapt, they do not adapt to climate change, they adapt to circumstances.

— Interview with Prof. Dr. Christopher Gordon, University of Ghana at Legon, Scientific Coordinator for the National Climate Change Policy

Official adaptation policy debates in Ghana revolve primarily around the potential risks and financial constraints that climate change poses for socioeconomic development. Climate change is commonly regarded as a problem being caused by industrialized countries, but also seen as a 'game changer' and political window of opportunity to address well-known development priorities by adopting an integrated adaptation approach that puts the poor and vulnerable at the center of political attention. Adaptation policy narratives in Ghana are thus closely linked to familiar sustainable development discourses, although new financial instruments such as the *Green Climate Fund* (GCF) and the *Adaptation Fund* (AF) are increasingly influential with regard to the strategic orientation of development planning and disaster risk reduction at different levels of government. Debates about climate change and adaptation are also emerging in the media, civil society and the academe, whereas state institutions and international donor organizations are positioning themselves in the changing political landscape, offering and 'mainstreaming' (i.e. *normalizing*) their own specific interpretations of risk and vulnerability. In consequence, it has

become increasingly difficult to gain a comprehensive overview of the multiple strategic priorities and implementation approaches that are currently influencing the Ghanaian adaptation 'arena'.

In the case of adaptation finance, the ongoing policy debate can largely be subsumed under the technical term *climate finance readiness*. In the agricultural sector, the government of Ghana has previously identified *Sustainable Land and Environmental Management* (SLEM) as a strategic entry point for long-term adaptation planning (GoG 2015, p. 73). The key policy focus in agriculture is firmly placed on developing climate-resilient agriculture and food security systems, for example through the introduction of improved crop varieties, non-organic fertilizers, and the piloting of weather index insurance products. The strategic priority areas of the NCCP also include disaster preparedness and response, equitable social development (i.e. issues related to health, water, sanitation, gender, and migration), as well as 'appropriate' infrastructure and energy systems development. Yet, broader concerns still persist among policy makers with regard to existing funding mechanisms and institutional capacities that are needed to implement concrete adaptation actions and ensure donor coordination.

One policy option under discussion is to build on existing organizational structures for disaster risk reduction to create integrated stakeholder platforms and common financing mechanisms for addressing environmental management, DRR and sustainable development across sectors and at the national, regional and district levels. Implementing such actions ultimately depends on improved access to international funding streams, especially those administered by the GCF and AF, as well as new financing sources in the development sector. Yet, it is clear that GCF and AF funds alone are unlikely to cover a reasonable part of the expected adaptation costs in Ghana. Thus it is argued that further donor support for sustainable development is required, including the possible implementation of (highly contested) REDD+ activities to address deforestation and forest degradation.

The Ghanaian government, in cooperation with the government of Japan and the United Nations Development Programme, has therefore initiated a policy dialogue on innovative climate finance options under the *Africa Adaptation Programme (AAP)*, and launched the *Green Climate Fund Readiness Programme* in June 2015. The different finance options that are currently under discussion include private sector cooperation and privatization, domestic budget support, and enhanced adaptation financing through capital markets. As outlined in the NCCP, the government is prioritizing a coordinated approach to climate change financing based on existing practices in public financial management and national development planning. However, insufficient information on climate change impacts in specific sectors, coupled with lack of credit enhancement schemes has thus far dissuaded private sector institutions like banks and insurance companies from getting more actively involved in risky climate change adaptation and mitigation projects, regardless of the expected negative impacts of climate change on key sectors of the Ghanaian economy.

A more innovation-oriented approach to harnessing private sector financing for CCA and DRR activities has been outlined in the national *Budget Statement and Economic Policy* for the fiscal year 2015, themed "Transformational Agenda: Securing the Bright Medium Term Prospects of the Economy". In line with paragraph 449 of the budget, the Ghanaian government has decided to "implement measures to undertake climate change and green economy programmes and projects that promote clean environment, job creation and poverty reduction [as well as] Climate Public Expenditure and Institutional Review (CPEIR) leading to climate sensitive budgeting in the medium term" (GoG 2015, p. 88). This approach is generally well aligned with the strategic priorities that are described in the 2010 policy discussion document *Ghana Goes for Green Growth*, and with the overarching vision of the NCCP (2013, p. ix), namely to "ensure a climate resilient and climate compatible economy while achieving sustainable development and equitable low carbon economic growth for Ghana."

Nevertheless, in spite of the increased political attention for climate change it must be conceded that the current status of climate finance readiness in Ghana is still relatively low, particularly with regard to the country's lack of organizational capacity to manage accessed funds and compete for international funding streams, including financial resources channeled through the GCF and AF. While donor-driven capacity building initiatives have contributed considerably to keeping environmental governance and climate change finance on the government's agenda, substantial progress has yet to be made in the fields of knowledge transfer, awareness raising and implementation.

At the same time, much will depend on the aftermath of the twenty-first session of the Conference of the Parties to the UNFCCC, which has been held in Paris in November/December 2015, and the political will to capitalize the GCF and other climate finance mechanisms to provide adequate financial support for the implementation of adaptation initiatives and programs. By the end of 2015, the AF had only disbursed a total volume of 95 million USD in grants, including 8,293,972.19 USD for a project on water management and livelihood diversification in northern Ghana. The GCF Board, in turn, is still in the process of approving relevant projects and programs. While this research is conducted, it is still unsure whether Ghana will be able to secure GCF funding due to complex accreditation and application procedures. Moreover, since it is abundantly clear that current adaptation financing is insufficient to address Ghana's adaptation and development challenges in the medium and long term, additional financial efforts on behalf of the private sector will be required to reinvigorate the global partnership for Sustainable Development. The preliminary *Addis Ababa Action Agenda of the Third International Conference on Financing for Development* notes that

Achieving an ambitious post-2015 development agenda, including all the SDGs, will require an equally ambitious, comprehensive, holistic, and *transformative approach* with respect to the means of implementation, combining different means of implementation and integrating the economic, social and environmental dimensions of sustainable

development. This should be underpinned by *effective, accountable and inclusive institutions*, sound policies and good governance at all levels (DESA 2015, p. 3; emphasis added).

Financial decisions at the global and national levels of governance will therefore determine the actual implementation of adaptation actions. Meanwhile, critics have been quick to note that the concept of 'climate finance' still remains ill-defined from a legal perspective, potentially favoring the re-labeling of Official Development Assistance (ODA) as climate finance.³⁶

Another point of contention is the utter disregard for *climate justice* concerns such as public accountability and civil society participation during the establishment of the GCF. The policy process that has led to the formation of the GCF *Private Sector Facility*, in particular, raised pertinent questions about the United Nations' efforts to engage private investors and businesses. Civil society organizations have repeatedly pointed to multiple instances of *regulatory capture* due to intransparent bureaucratic procedures and the biased appointment of official consultants whose "advice" created a path dependence in framing priority areas for GCF investment (Bracking 2015). The strong impetus on the commodification of the environment in the debate about climate finance also increases the likelihood of 'transforming transformation' into another empty signifier that is used to shape policy discourses according to private sector interests. Large-scale investments by agro-industries and other strictly market-oriented interpretations of 'transformative' socioeconomic change thus harbor the danger of neglecting pro-poor adaptation policies, and set the scene for different adaptation scenarios, ranging from business-as-usual to adjustment, reform, and *agricultural* transformation.

³⁶ Field notes: Interview with a member of the National Climate Change Committee. Accra, August 2012.

Defining the Dispositif: Policy Translation from the National to the Local Level

Mainstreaming Adaptation and Disaster Risk Reduction into Development Planning

The National Climate Change Adaptation Strategy (NCCAS 2010) of Ghana outlines ten (10) priority adaptation programs that have been identified according to the *Akropong Approach*. These priority programs are also reflected in the newly adopted NCCP, and emphasize the centrality of poverty reduction and socioeconomic development for climate change adaptation in Ghana. They are shown in the table below.

Table 6. Priority Adaptation Programs of the NCCAS

1.	Increasing resilience to climate change impacts: identifying and enhancing early warning systems
2.	Alternative livelihoods: minimizing impacts of climate change for the poor and vulnerable
3.	Enhance national capacity to adapt to climate change through improved land use management
4.	Adapting to climate change through enhanced research and awareness creation
5.	Development and implementation of environmental sanitation strategies to adapt to climate change
6.	Managing water resources as climate change adaptation to enhance productivity and livelihoods
7.	Minimizing climate change impacts on socioeconomic development through agricultural diversification
8.	Minimizing climate change impacts on human health through improved access to healthcare
9.	Demand- and supply-side measures for adapting the national energy system to impacts of climate change

10.	Adaptation to climate change: sustaining livelihoods through enhanced fisheries resource management
-----	---

At the highest political level, the *Ministry of Environment, Science, Technology and Innovation* (MESTI) serves as the main coordinating body for the integration of climate change adaptation measures into national development planning, and specifically into Ghana's Shared Growth and Development Agenda (GSGDA II 2014). The mainstreaming process is currently piloted in ten (10) Districts.

However, due to the diversity of individuals and organizations that are already involved in the implementation of adaptation measures in Ghana, it has become increasingly important for adaptation scholars to investigate the inter-sectoral *policy networks* that are spearheading current implementation efforts. The responsible organization for the implementation of adaptation policies, the Environmental Protection Agency (EPA), explicitly underlines the importance of inter-sectoral policy networks by concluding that

(...) the success of inter-sectoral processes in fighting climate change risks depends to a large extent on an enhanced understanding and acceptance by policy makers, technocrats and all other stakeholders. They must be linked to the institutional structures (rules, procedures, regulations, norms, values and organizations) within the national development planning system (EPA 2013, p. 4).

With a stronger political commitment to mainstreaming thus comes a discernible shift in official policy discourses. To be precise, the adaptation policy debate has been extended from short-term reactive adjustment measures to the integrated implementation of CCA and DRR efforts across sectors, and at the regional, district and sub-district levels. Notably, a guidebook on '*Integrating Climate Change and Disaster Risk Reduction into National Development, Policies and Planning*' has been released in 2010 by CC-DARE, EPA, the National Development Planning Commission and NADMO. The technical guidebook outlines several

areas for mainstreaming that closely follow the national development policy process, including policy formulation, planning, budgeting and implementation as well as monitoring and evaluation (Nelson *et al.* 2010, p. 31).

Without going into further details, it seems as if a core policy narrative emerges from the National Adaptation Strategy, the National Climate Change Policy, and the Hyogo Framework for Action: institutional reforms are urgently required to mitigate the risks that climate change poses for socioeconomic development, and to build a strong organizational basis for policy implementation (Nelson *et al.* 2010, p. 17; also see NCCP 2013). In short, institutions should be strengthened to become more transparent and adaptive to change, which can present new development opportunities. However, such discussions about institutional reform, mainstreaming and policy networks are not a new phenomenon. In fact, they are tightly linked to another influential debate that has shaped Ghanaian political discourses since the late 1980s: the issue of *decentralization*.

Decentralization and Structural Challenges for Implementation

Ghana's decentralization process has been driven by the political will to overcome the inefficiencies associated with inherited colonial governance structures. The Local Government Law of 1988 as well as the Fourth Republican Constitution of 1992 made provision for decentralization and structural reforms with the main goal to create enabling political conditions for equitable social development. The desired outcome was to replace centralized organizational arrangements by transferring political, administrative and financial authority from the national level to the Metropolitan, Municipal and District Assemblies (MMDAs). This transfer of responsibilities to the MMDAs, however, is still far from being completed. The *Ministry of Local Government, Rural Development and Environment* (MLGRDE), the mandated government

authority for the coordination of Ghana's decentralization efforts, outlines ten (10) priority action areas for Ghana's 'National Decentralization Action Plan' (2010-2014):

1. Political decentralization and legal reforms;
2. Administrative decentralization;
3. Decentralized development planning;
4. Spatial planning;
5. Local economic development;
6. Fiscal decentralization;
7. Popular participation and accountability;
8. The social agenda;
9. Involvement of non-state actors in local governance; and
10. Institutional arrangements for policy coordination.

However, in Ghana's three-tiered system of local governance, policy networks are permanently competing for influence in central-local government relations (Koranteng and Larbi 2008). In other words, policy networks are making use of legal, budgetary and other systemic power asymmetries to shape the outcomes of decentralization processes according to their specific interests. This political aspect of decentralization includes strategic competition for financial and other resources between political networks within the *Regional Coordinating Councils* at the regional level, the *Metropolitan, Municipal and District Assemblies* at the district level, and the *Town/Area Councils* and *Unit Committees* at the sub-district level (which are sometimes even dysfunctional).

As the initial case study has illustrated, another layer of complexity is added through the political 'double bind' of chiefs and earth priests, who are often (informally) involved in party politics, while simultaneously performing their role as traditional leaders.

In sum, there is little doubt that the slow decentralization process has an inhibiting effect on the implementation of adaptation measures. The

NCCAS explicitly recommends a decentralized implementation strategy and frames the district level as the "most crucial level" for implementation efforts (NCCAS 2010, p. 23). Yet, slow implementation should not be seen as a regulatory problem. Most practitioners were in fact of the opinion that existing decentralization laws and policies are sufficient in principle, while the channeling of financial resources to the Metropolitan, Municipal and District Assemblies was seen to be unsatisfactory in practice, regardless of political commitments to fiscal decentralization. Accordingly, it was a commonly held sentiment among participants that decentralization laws needed to be more rigorously applied, and that increasing the capacity of district and sub-district level staff to access and manage financial resources is critical to ensure public accountability, facilitate cross-sectoral action, and address local adaptation priorities. During an interview with a policy expert in Accra, this sentiment was expressed very clearly:

The legal framework for decentralization is good, but the problem has to do with enforcement. Every district generates local revenues and some percentage is supposed to be given to local structures, but there is no capacity. We do not have people with the capacity to manage the resources there. So the problem is related to understaffing as well as limited knowledge. Also, at the national level, with regard to the District Assemblies, there is supposed to be fiscal decentralization, but there is a resistance because those at the national level think that if they push the resources there, they will have nothing left for themselves (...), they want to continue controlling those at the local level.

So you have resistance at the national level to channel resources to the District Assembly level, and at the District Assembly level to send resources to the lowest level, that is the Area Council and Town Council level.

– Advocacy & Strategic Partnership Manager on Climate Change, CARE International, Accra

The hierarchical structure of decision making and the influence of national-level policy networks is also visible at the level of the *Regional Coordination Councils* (RCCs). The ten (10) RCCs in Ghana are largely

controlled by the respective Regional Ministers, who are, in turn, directly answerable to the central government. A regional government official explains:

Each institution reports to the head office. The Regional Minister can have some ideas, but if the head office does not see it as their vision, it will not work out. You may have a particular regional vision, but it may not be the Ashanti regional vision, the Western regional vision. At the head office they are looking at all these regions (...)

On the ground, decision making is supposed to be decentralized so that you can take decisions then and there, apply them, and make sure that you solve your problems. But decentralization exists only on paper, we do not have financial decentralization. Somebody who is not seeing what is happening on the ground may decide to cut the funding (...)

Even if you decentralize, you may take a decision now, and those looking at your expenditures may not agree. Let's say you are supposed to be constructing dams as an irrigation development authority, and now you also want to plant trees. These expenditures may not even be covered by your mandate. If you are dealing with environmental issues, you may want to take decisions that will involve tree planting, that will involve getting communities organized, but because there is no complete decentralization someone will tell you that this is not your mandate.

– Senior Basin Officer, White Volta Basin Office of the Ghana Water Resources Commission, Bolgatanga

Along with a lack of financial resources, decentralization challenges were frequently mentioned as a problem during expert interviews and are widely acknowledged to be one of the most important reasons why the implementation of adaptation policies is an exceedingly difficult task. In fact, decentralization challenges are featured prominently in scientific articles and donor brochures about every imaginable development issue that is currently under discussion in Ghana, ranging from local economic development and natural resource management

to disaster risk reduction, gender mainstreaming and climate change adaptation. Curiously, however, the analysis frequently stops at this point, and technical or managerial recommendations are made that assume the existence of a neutral state apparatus, while trying to explain how 'actors' form their causal beliefs about political interventions according to 'rational' criteria.

Following this structural logic does not present a problem *per se*, due to the fact that people who are working in governmental environments are certainly engaged in multiple practices of rational organizing. However, even assuming that decentralization and organizational reforms are the *sine qua non* to advance adaptation, it has to be asked how managerial rationalities are seen – and often transcended or transformed – by those who are supposed to enact them.

At the regional and district level, government officials and assembly members have developed a rather critical view of new mainstreaming and policy pilot initiatives, mainly as a result of increased workloads for pilot districts and due to mainstreaming approaches that neglect long-term training measures. Capacity building and training workshops at the regional, district and sub-district levels are often irregular events, mainly as a result of relatively short project and funding cycles, while technical and structural capacities for the implementation and/or coordination of adaptation activities are still weak.

When asked to name the most relevant political bodies that could facilitate the decentralized coordination of adaptation activities across sectors, policy experts frequently mentioned the Regional *Disaster Management Platforms*. At the regional level, DRR platforms are chaired by the Regional Minister, while the NADMO Regional Coordinator serves as a secretary. Platform membership also includes other regional directors of government MDAs, together with representatives of the armed forces, the police and fire services, as well as academia, donor organizations, and the private sector. However, it is evident that the focus of regional DRM platforms is mainly on disaster prevention

and relief efforts, and not necessarily on the planning and local implementation of adaptation programs or sustainable development projects. It was pointed out in interviews that there was little exchange on climate change matters among the regional heads of government ministries, departments and agencies in the context of DRR platform meetings. One DRR specialist also mentioned that the activities of the DRM platform are mainly related to advocacy, awareness creation and coordination, while a government employee remarked:

When they were designing the DRM platform, in my view, they thought of disaster only in terms of floods.³⁷

Participants also considered *Environmental Management Committees* at the regional and district levels to be particularly relevant for the coordination and implementation of adaptation activities. The EPA has established Environmental Management Committees at the regional and district levels to monitor and coordinate activities related to environmental protection and enhancement. At the regional level, Environmental Management Committees consist of the regional heads of departments and organizations, the District Assemblies, the Regional and District Planning Officers, NGOs and traditional authorities. District level Environmental Management Committees, in turn, are made up of five (5) District Assembly members as well as selected representatives of environmentally related departments, NGOs, and CBOs.

Arguably, these coordinating platforms are still embedded in the same political networks and top-down governance structures that characterize the entire political management system in Ghana. In the Upper East Region, Environmental Management Committees are nonetheless perceived to be suitable institutional entry points for the implementation

³⁷ Field notes: Interview with Sustainable Development Analyst, UNDP, Accra, September 2012, and interview with Senior Basin Officer, White Volta Basin Office of the Ghana Water Resources Commission, Bolgatanga, January 2013.

of adaptation actions, mostly due to the fact that there is already practical experience with desertification control, environmental awareness creation, and community involvement. Strengthening the role of these environmental committees, financial and otherwise, and linking them more closely to the work of the DRR platforms and the Ghana Meteorological Service was thus considered a preferred policy choice compared to establishing new adaptation-related implementation arrangements. Interestingly, participants considered the National Climate Change Committee and other ministerial climate change 'desks' or 'task forces' that have recently been inaugurated by the central government to be of much less relevance for the roll-out of community-based adaptation programs on the ground.³⁸

One possible reason for these reservations among policy experts is the fact that the mainstreaming of donor-driven development concepts – for example desertification and gender equality – has been strained by the same type of decentralization challenges that are now stalling the mainstreaming of adaptation policies. With regard to previous experiences in gender mainstreaming, Ramya Subrahmanian (2007, p. 113) observes that, since the late 1990s, a "decade of mainstreaming experience has uncovered many lessons. Many of these are about the nature of the state and its institutions, and the kinds of spaces that are available to promoting transformative change."

Strengthening existing Environmental Management Committees and DRR platforms may thus be seen as an ambitious or even unrealistic political goal, as it implies to tackle the underlying structural problems of decentralization. In light of the wider transformative development agenda, however, the counter-argument holds that the introduction of new national-level networks for environmental management has thus

³⁸ These include: the EPA climate change desk; the MOFA climate change task force; MOFEP Climate Change Unit; the Ghana Environmental Conventions Coordinating Authority (GECCA); and the NREG program.

far yielded little evidence of meaningful community involvement and tangible improvement on the ground (Torpey 2012).

Therefore, to learn more about the discursive landscape in which the decentralization debate unfolds, it is important to engage with organizational narratives about *risk-seeking* or *risk-avoiding* behavior. Assuming that taking ownership of reformist/transformational agendas is perceived to be more politically or financially risky than the negative effects of the *status quo* – for example unsustainable economic development and severe disaster impacts – it is questionable whether normative and cultural-cognitive changes will occur at a fast enough rate to avoid serious development setbacks.

As I have outlined earlier, general risk preferences with regard to policy choices in the public sector are significantly shaped by donor agendas, financing, and influential development policy networks at the level of the central government. It can thus be concluded from the preliminary results that finding appropriate solutions for highly specific adaptation contexts crucially depends on enabling structures for inclusive and sustainable social development. Indeed, if the overarching goal of adaptation actions is strengthening people's adaptiveness and fostering resilience, progressive and ambitious political goals should not be neglected, even if the interpretation of the transformational development agenda remains a controversial political issue.

Expert Views on Adaptation

International Development Agencies

Adaptation experts and policy makers in Ghana seem to agree that, in addition financial constraints, low levels of public awareness and insufficient organizational capacities are major impediments for policy implementation. This includes the organizational ability to monitor and assess adaptation programs, and to determine the *status quo* (or baseline) that enables decision makers to establish criteria for 'successful' adaptation. In order to define consensual criteria for success, it has been suggested to involve 'affected' populations more closely in the planning and implementation of adaptation projects, according to the reformist notion of 'participatory' decision making and in line with the NCCP principle of *subsidiarity*, which states that decisions should be taken at the lowest appropriate level in society (see NCCP 2013, p. 23).

However, it has to be borne in mind that addressing political questions about adaptation from a solely state-centric perspective means being bogged down by a managerial mindset that permanently forces the scholar to think in organizational categories. It may also lead to a narrow view of adaptation as a purely techno-scientific problem that can only be solved by experts. Hence I will draw on a discourse analytical repertoire to illustrate how international agencies and donor organizations are influencing technical governance discourses by identifying cause-and-effect connections, and by suggesting 'appropriate' adaptation responses.

Without doubt, development partners exert a good amount of influence on sector-specific policies in Ghana, including climate change adaptation. Sometimes this influence is clearly visible, for instance through direct budget support, policy mainstreaming, assistance with report writing, and donor representation in political bodies such as the National Climate Change Committee. In other cases, donor influence

is more subtle, and framed as 'technical' assistance. This may include the operationalization of risk and vulnerability assessments, the selection of pilot studies as well as and the interpretation of technical concepts such as adaptation, sometimes in line with private economic interests at the level of implementation.

Thus, in view of the accelerating commodification and 'neoliberalization' of the transformative development paradigm – especially in the agricultural and forestry sectors – there is obviously little reason to value third party consultation as objective and without motive.

Similarly, it must be assumed that local elite networks are potentially complicit in advancing rent-seeking behavior and corruption. In the context of Ghana, as well as internationally, it is an open secret that enforcing accountability and transparency vis-à-vis powerful financial and political interests is an arduous task. A Ghanaian NGO representative remarks:

We act as watchdogs. Industrialized countries together with the World Bank and big international corporations offer financial support for climate change projects, but they are often using the problems of African countries to present false ideas just for their own profit (...) What is the zeal of Ghana as a country to strengthen climate justice? It has not happened yet.

– Member of the National Climate Change Committee & Friends of the Earth, Accra

When taking a closer look at how adaptation options are framed in international donor accounts, a good number of examples for 'neoliberal' adaptation solutions can certainly be found. Examples include Payments for Environmental Services (PES), promoted by the World Bank under the umbrella of Sustainable Land Management (SLM), and the endorsement of a highly controversial Green Revolution model of agriculture, primarily advanced under the banner of the *Global Alliance*

*for Climate-Smart Agriculture (CSA).*³⁹ Other examples for controversial market-based approaches are genetically engineered 'climate-ready' crops, carbon trading schemes such as REDD+, as well as the piloting of agricultural insurance products in selected districts by international donor agencies and the insurance industry.

For the case of Ghana, it must nevertheless be conceded that private sector interests in the area of climate change and adaptation are still limited in scope, and should not be exaggerated. Quite to the contrary, the private sector is currently more interested in exploiting fossil fuel reserves and degrading the environment rather than to invest in a 'green' economy. The Upper East Region, in particular, generally suffers from a lack of public and private investment in every sector of the economy, ranging from waste management, education and infrastructure to energy, communications and health service provision. While this situation is troublesome indeed, it also presents new opportunities for investments in decentralized renewable energies, agroecological solutions and other environmentally friendly technologies. What is problematic, however, is that development policies for Ghana's north have achieved relatively little to support small-scale farmers as well as

³⁹ For a critical scientific review of the Green Revolution model see IAASTD (2009). Moreover, an open letter signed by an international coalition of more than 80 NGOs and CSOs states: "Food producers and providers – farmers, fisherfolk, and pastoralists – together with our food systems are on the front lines of climate change. We know that urgent action must be taken to cool the planet, to help farming systems – and particularly small-scale farmers – adapt to a changing climate, and to revive and reclaim the agroecological systems on which future sustainable food production depends. The Global Alliance for Climate-Smart Agriculture, however, will not deliver the solutions that we so urgently need. Instead, 'climate-smart' agriculture provides a dangerous platform for corporations to implement the very activities we oppose. By endorsing the activities of the planet's worst climate offenders in agribusiness and industrial agriculture, the Alliance will undermine the very objectives that it claims to aim for. Although some organizations have constructively engaged in good faith for several months with the Alliance to express serious concerns, the concerns have been ignored. Instead, the Alliance is clearly being structured to serve big business interests, not to address the climate crisis" (see <http://www.climatesmartagconcerns.info>, September 2014).

women, young people, the elderly, and the urban poor. In sum, these groups are frequently neglected in the context of sporadic project interventions, while international donor attention mainly rests on commercial agriculture and export-oriented growing schemes to stimulate job creation, following the logic of trickle-down economics. There is also a neglect of rapidly growing peri-urban areas where urbanization is creating new marginality 'hot spots' through the transformation of traditional agricultural livelihoods.

Admittedly, questions of 'inclusive' and 'participatory' development have not been completely ignored in mainstream adaptation policy discourses. The government's definition of adaptation as a development issue primarily sees adaptation as a political and social question. Similarly, international development agencies are promoting sustainable, participatory and inclusive development. An international public servant remarks:

I think the issue is also about equity, because your economic status will affect the way in which you respond to risk – I am talking about autonomous adaptation. There are cases where the relatively well endowed households are trying to manage their risks, and they can do it by themselves. But their actions will influence the way the poor households manage their risks. One anecdote that I heard during our adaptation consultation is that the richer households tend to raise more cows to manage their risk. But that would mean encroaching into communal lands which are also degrading. So poverty is a big challenge, but it is also about equity. In the northern regions, I think, this is a big challenge.

– Programme Specialist for Sustainable Development, UNDP, Accra

Arguably, such definitions of risk are still neglecting macroeconomic factors and regulatory capture within processes of rational organizing. It is therefore necessary to delve a little deeper into the troublesome question of policy translation.

The National Disaster Management Organization

In order to investigate how layers of social signification are changing as soon as the concept of climate change adaptation is translated and re-negotiated at the district level, structured interviews with NADMO district coordinators in the Upper East Region of Ghana (n=13) have been conducted. Among several other questions, the district coordinators were asked to consult with their colleagues and team members to describe what the idea of adaptation means (or could mean) for their daily work. Throughout the entire UER, seven out of thirteen districts provided a response to this specific question. This equals a total regional response rate of 53.8 percent.⁴⁰

In sum, the following definitions of climate change adaptation were given by the NADMO Municipal and District secretariats (*discourse referents are marked for anthropocentric and natural causal explanations*):

- (1) "Climate change adaption means how the environment changes in a particular season each year."
- (2) "Climate change adaption means adjusting to a situation that would occur as a result of climate change impacts, e.g. too much rainfall, long periods of drought, too much heat that can bring Cerebrospinal Meningitis."
- (3) "Climate change adaption may be described as measures put in place to cope and deal effectively with changes that may occur in the environment as a result of changes in the climatic conditions or the weather."

⁴⁰ The survey was conducted after the district reform of July 2012, when four new districts were established in the Upper East Region, bringing the total number of municipalities and districts to thirteen (13). The Municipal and District secretariats who provided a response (7) were located in the Kassena–Nankana East District, Kassena–Nankana West District, Bawku Municipal District, Bolgatanga Municipal District, Nabdum District, Bulisa South District, and the Bongo District.

- (4) "Climate change adaption is changing your attitude and actions to enable you to live under an inevitably changing climate [*symbolic reference to fate, note of the author*] with minimum disturbance in your new way of life, for example with regard to your shelter, your food, your clothes, farming practices, etc."
- (5) "Climate change is a situation which is characterized by both man-made and natural occurrence which has a negative impact on mankind. The factors which contribute to climate change are as follows: air pollution, pollution of water bodies, deforestation."
- (6) "Climate change adaptation means responding directly or indirectly to human activity that alters the composition in the global atmosphere and which, in addition to natural climate variability, can be observed over a longer time period."
- (7) "Adaptation is that what we have to do to protect us and our children."

These different statements about the nature of adaptation are intriguing for several reasons. First of all, it is noticeable that almost all of the above definitions are in some way or another framing adaptation as *coping* or *adjustment* to natural phenomena, while the statements number (2) and (3) even mention these terms explicitly, and statement number (4) makes a reference to inevitable fate. Second, if human involvement in climate change is acknowledged, improved environmental protection is often suggested as a solution, for example in statements number (5) and (6). The statements that are found to be most closely linked to political or development-related issues are 'changing your attitude and actions' (4), and protecting 'us and our children' (7).

But what do these findings actually mean for the implementation of adaptation policies? Broadly speaking, it can be concluded that efforts at 'mainstreaming' climate change adaptation into DRR planning at the district level have successfully advanced 'mainstream' resilience thinking, and thus promoted narratives of adaptation as coping or adjustment to environmental phenomena. Moreover, it appears that the link between adaptation, DRR and social development is still rather weak at the district level. Yet, to be able to fully interpret these *problematizations* of risk, the risk perceptions of NADMO district officials need to be further examined. Initially, members of the individual NADMO secretariats in the UER were asked to rank the risks in their specific districts on a scale ranging from 8 ('most important') to 1 ('least important'). Selected results for the two NADMO district secretariats in the Veja Catchment are presented below.

Figure 6. Risk Perception of NADMO Specialists in the Bolgatanga Municipal District

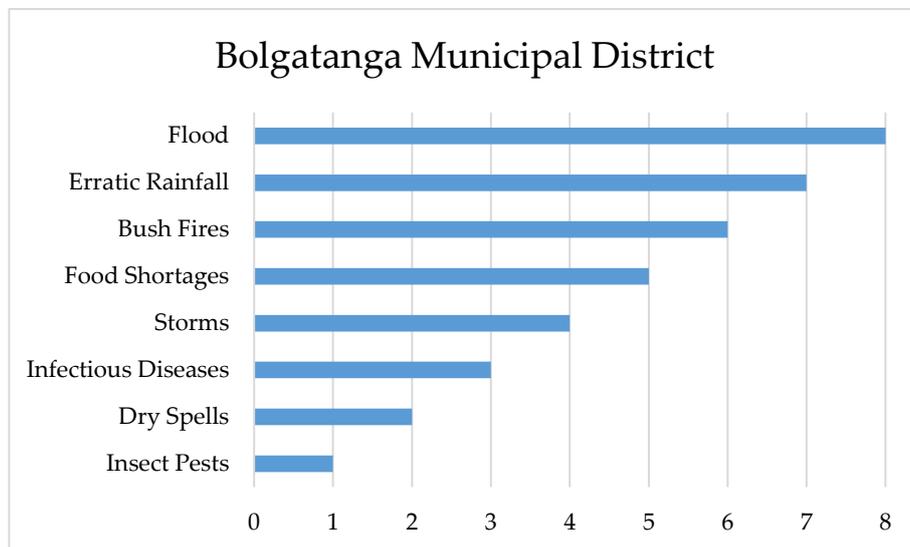
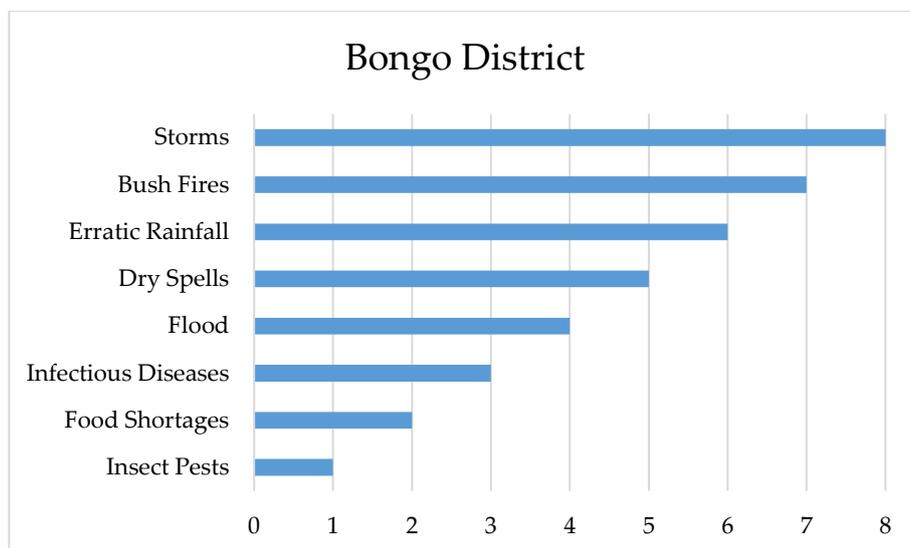


Figure 7. Risk Perception of NADMO Specialists in the Bongo District

When asked for the underlying reasons that determine the 'risk status' of people with regard to the above mentioned hazards, one high ranking NADMO official explains:

We did a vulnerability assessment in some of the communities. We also looked at the hazards, their period of occurrence, their force and frequency. With regard to vulnerability, we look at physical vulnerability, social vulnerability, economic vulnerability. We also do capacity assessments. You cannot do DRR without looking at these things. But the greatest factor that actually determines the risk status of our people has to do with poverty ... I will use my own term – 'micro-micro' poverty. That is poverty at the smallest units level. I do not even want to use the term household. It is even smaller than the household, at the individual level. It has to do with unemployment. The majority of the youth are unemployed. They have no sources of livelihood, so that makes them helpless. Then, if you take the household level, many depend on rainfed agriculture.

– Upper East Regional NADMO Coordinator, Bolgatanga

It becomes very clear from these findings that the negative impacts of 'natural' hazards such as flood, drought and changing rainfall patterns are mediated by poverty and high unemployment rates. The government's priority to foster job creation for young people should, therefore, be seen as directly related to adaptation. While youth make up roughly one third of the population in Ghana, the dilemma that decision makers are currently facing is that the formal sector is largely incapable of presenting the majority of young people with sufficient educational, economic and social opportunities. This situation leaves informal sector employment as the only alternative against the backdrop of accelerating urbanization, population growth and rural transformation. According to statistical data presented by the African Development Bank, the OECD Development Centre and the United Nations Development Programme, the overall unemployment rate for the age group between 15 and 24 in Ghana is currently at 25.6 percent (African Economic Outlook 2012, p. 14).

At the same time, it needs to be taken into account that risk and human vulnerability are crucially determined by the institutional organization of territoriality. This organizational 'making of landscapes' includes infrastructure, service provision as well as knowledge and resource flows. As I have argued earlier on, it is precisely the complex interplay between situated and relational risk that makes the use of terms such as 'adaptive capacity' inherently problematic. Not only are peoples' capacities mediated by social vulnerability and institutional settings, they are also potentially limited by macroeconomic effects that are beyond the immediate control of the individual.

From an educational perspective, the 'capacity' NADMO staff in the UER is certainly above average. Senior staff members have often obtained an academic degree, while some employees indicated during interviews that they have previously authored books and taught classes. The overall picture with regard to the material equipment at the regional and district levels, however, is rather bleak. A NADMO District Coordinator remarks:

The district office has no vehicle, which makes it very difficult to carry out our mandate. Moreover, it is at times difficult to reach our staff on their cellphones because of network problems.

– NADMO District Coordinator, Bongo District

Certainly, one would be right to conclude that these material and infrastructural constraints are merely symptomatic of a general lack of resources. Participants concurred, for example, that there was an overall shortage of relief items, recovery and rescue tools, boats, and life jackets during flood and storm events, and that most of them were stored at the regional headquarters and needed to be transported in case of an emergency situation. Eight out of thirteen NADMO district secretariats (61 percent) also indicated that data sharing practices between government agencies were unsatisfactory, especially with regard to meteorological information. Moreover, it was pointed out by 31 percent of the participants that available maps were either outdated or not very accurate. Flood maps are usually not digitalized, and often prepared by donors (see Picture 3).

Picture 3. Flood Maps in the NADMO Regional Office, Bolgatanga



© Author, 2012

Overall, donor dependence is exceptionally high, mostly due to the fact that disbursements from the District Assemblies' Common Fund for DRR activities are still far from being sufficient. As expected, this material argument also extends to the capacity building aspect of DRR. Training small groups of people in using supportive technologies such as mobile GIS devices for vulnerability assessments is hardly the most pressing issue, as long as simple means of transport are not available for many staff members in their daily work. Moreover, it will be required to offer additional training on disaster response and rescue for local level staff and NADMO volunteers.

Under these circumstances, and as long as the government prioritizes other policy sectors, it will be extremely difficult for NADMO to fulfill its actual mandate – especially at the post-disaster stage. This rather well-known fact has been made explicit in almost every report and scientific assessment that has been dealing with the implementation of the *Hyogo Framework for Action* in Ghana.

Unsurprisingly, the *National progress report on the implementation of the Hyogo Framework for Action (2013-2015)* also links remaining implementation gaps at the district level to unfinished fiscal decentralization:

Through the national budgetary allocation funds are made available for disaster management annually in the country. These funds include the contingency funds, a percentage of the district assembly common funds within the local government system allocated to disaster related activities ... The budgetary allocation for DRR in the country is not enough because not all the amount approved for DRR activities are released from the approved budget. Some institutions do not see the need for DRR hence do not make provision for it (NADMO 2015, p. 10).

Similar material and organizational constraints are also hindering the implementation of improved early warning systems, as I will briefly illustrate in the following section.

Improving Early Warning Systems

Indigenous early warning systems for environmental hazards such as drought, floods and storm surges in Ghana have, in large part, developed independently of modern technological advances, while still being deeply engrained in existing communal structures and nature-culture relations. Technology-based early warning systems now operate in parallel with these indigenous systems, usually following a top-down and linear *End-to-End* (E2E) model of early warning (UNISDR 2009). The E2E model in Ghana is mostly based on data recorded at the GMet weather stations throughout the country. Anomalous rainfall patterns are recorded and reported to the GMet headquarters, where the validity of the information is cross-checked and subsequently shared with other governmental organizations such as NADMO and the river basin authorities. Alternatively, information from the district level is communicated upwards to national level authorities for validation. In case of a confirmed emergency situation, NADMO issues an official warning message and initiates actions for disaster risk management at the regional and sub-regional levels. As a final step in the E2E model, an early warning message is disseminated directly to potentially affected communities where appropriate preparations are made.

Yet, it must be considered that the above description of the E2E process represents an ideal state of affairs, while the current status of early warning systems in Ghana remains problematic. In early June 2015, the tragic flood disaster and related explosion of a gas station near the Kwame Nkrumah Circle in Accra have called attention to the fact that the translation of early warning information into targeted responses at the community level is still a major constraint for NADMO as well as other emergency management organizations.

Besides organizational limitations, social vulnerability in flood prone areas is exacerbated by the insufficient enforcement of building codes and a lack of adequate infrastructure such as public emergency shelters and drainage systems. Thus, it must be concluded that the strategic

shift in DRR policies from reactive emergency management to more proactive awareness creation, risk mitigation and vulnerability reduction efforts is still not complete.

In order to facilitate the desired policy shift toward prevention, and to actualize the integrated implementation of DRR and CCA activities, NADMO and the Government of Ghana have entered into a strategic partnership with the Norwegian Government and UNDP under the *Community Resilience through Early Warning (CREW) Project* in 2012. The CREW project was implemented over a three year period from 2012-2015, and mainly focused on improved early warning systems for floods and drought. Its aim was to "build capacities within the country to reduce disaster risk by putting in place an integrated early warning system that is both scientific and people-centered" (CREW Project 2012, p. 2). However, the inherent limitations of these project-based DRR approaches have been clearly outlined by NADMO in its *National progress report on the implementation of the Hyogo Framework for Action*. The report concludes:

The CREW project only caters for 10 pilot districts and the programme may not be sustainable when the three years elapse. There is also the problem of adequate funding and logistical constraints (NADMO 2015, p. 16).

One possible avenue to improving the safety and adaptiveness of individuals that has been previously suggested in the DRR literature is to adopt a participatory (or *reformist*) early warning approach, where "communities at risk drive the conceptualization and application of early warning systems" (Baudoin *et al.* 2014, p. 13).

The essential problem with this approach is that it perpetuates a divide between scientific and traditional modes of knowledge production, while avoiding a deeper engagement with power-ridden institutional processes that potentially affect the outcomes of deliberative decision making. Communities at risk are, in other words, neither entirely com-

munal – for example with regard to gender disparities and social inequalities – nor fortuitously 'at risk'. Placing bottom-up communication at the heart of improved early warning approaches thus requires great caution, especially since social norms and previous experiences with development projects structure local political arrangements. As I have discussed in the first part of this chapter, flows of knowledge and resources between agencies and administrative levels in Ghana are highly politicized, while clientelist networks or political affiliations may undermine the impartiality of relief efforts. At the same time, structural and financial constraints are limiting the operational readiness of local organizational structures, especially at the level of the Town/Area Councils and Unit Committees.

Moreover, while indigenous early warning systems based on biological indicators are becoming increasingly unreliable due to changing climatic conditions, another pressing question that emerges is how the interplay between technological and non-technological warning systems might be enhanced. For example, how can educational efforts to discourage risky (or even illegal) behaviors such as building on waterways, farming in flood prone areas, and dumping garbage in drainage pipes be supported? Unfortunately, the National Climate Change Policy as well as the National Adaptation Strategy have little to say about how exactly these tasks could be achieved.

Considering existing patterns of social marginality and poverty, notions of 'choice' or 'cultural practices' may be little more than a distraction from underlying economic pressures that push many people into risky or illegal behavior. Particularly in the northern regions, it is questionable whether a strong focus on 'participation' and single 'priority' hazards such as drought and floods will yield sustainable outcomes for DRR and CCA in the current development climate. The main reason for this rather pessimistic outlook is the experience that creating spaces for participatory and community-based adaptation in local planning processes is not simply a matter of carving out apolitical niches and creating awareness for sporadic project interventions. Due

to the embeddedness of local level planning processes in top-down governance structures, authentic participation will crucially depend on organizational culture, donor incentives, and the long-term political will to create an enabling policy environment for CBA and DRR.

Nevertheless, to arrive at a more balanced picture, and to illustrate how farming households are officially supported in their struggles to adapt to multiple social and environmental stressors, it is necessary to investigate how adaptation is perceived by Agricultural Extension Agents (AEAs) who work directly with farmers in the research area.

Agricultural Extension Agents

The agricultural extension system in Ghana developed during the colonial era, mostly as an attempt to "extend" or transfer research-based knowledge to rural populations and promote the use of subsidized inputs to improve yields and increase agricultural productivity (Naamwintome and Millar 2013, p. 5). After independence in 1957, the state remained the responsible agent for agricultural extension delivery to farmers, until public sector involvement declined considerably during the early 1980s as a result of donor-driven structural adjustment programmes. The newly emerging vacuum in public service delivery was quickly filled, and ultimately led to a more prominent role for various NGOs and international donor agencies in supporting farmers.

According to Buadi *et al.* (2013, p. 20), it was only after 2007 that government investments in agriculture have increased again. Yet, there are many persistent challenges for the delivery of agricultural extension services in Ghana, for instance understaffing and a lack of training opportunities for AEAs.

Especially in the northern savanna zone, inadequate extension service delivery together with endemic poverty and a lack of access to credit and grain storage facilities outside of bigger irrigation schemes negatively affect the situation of small-scale food crop farmers who are not engaged in commercial agriculture.

At present, AEAs in Ghana do not offer specific climate change-related extension advice to farmers, although MOFA staff are generally well aware of increased climate variability and its effects on yields and crop productivity. At the same time, farmers themselves are very sensitive to ecological and socioeconomic changes and are constantly seeking for innovative ways to adapt. From a theoretical point of view, this means that the overall relationship between AEAs and farmers is not necessarily characterized by an *expert/lay* knowledge divide as farmers themselves are climate 'experts' in their own right. Yet, a top-down approach to knowledge 'delivery' based on the Western techno-scientific model serves as the underlying philosophy for official agricultural extension services today, even if the linear model of extension does not entirely preclude participation or knowledge co-creation. For instance, there are examples of *participatory extension* such as farmer-to-farmer exchange and farmer field fora that seek to facilitate social learning and voluntary exchange based on farmers' needs. Local farmer groups have proven to be another relatively stable platform for peer group exchange and farmer-driven innovation, even if individual economic interests based on competitive advantage may inhibit the flow of information, especially in the absence of suitable incentives to share innovations. Moreover, instead of focusing on more intensive work with individual farmers, MOFA policies and donor-driven projects frequently ask for the *ad hoc* formation of farmer groups, even if selected farmers have little previous experience in working together, thus endangering the sustainability of extension impacts.

However, extension impacts remain notoriously difficult to measure, due to a lack of baseline data and strong reliance on proxy indicators. Thus, a group discussion with twelve (12) AEAs in the Bongo District of the UER has been conducted in November 2012 to learn more about the most widespread agricultural adaptation strategies that are currently being used by farmers in the research area.

In sum, the AEAs described the economic situation of farmers in the Bongo District as increasingly difficult. Food crop farming continues to be the main economic activity in the area, whereas most agricultural households are poor smallholder farmers who depend on rainfed agriculture. Participants pointed out that average smallholder production often remains below subsistence level, and is thus insufficient to sustain a family, especially during the dry season. This means that it is nearly impossible for most households to make a living by farming alone. According to MOFA extension agents, ecological and population pressures on scarce resources such as soil and water are constantly growing, whereas yields are decreasing in the district. At the same time, only a few households are engaged in formal employment and farmers usually depend on donor support or wider social or elite networks to be able to obtain costly farm inputs.

Thus, in view of increasing human pressures on scarce natural resources, and bearing in mind the generally poor quality of soils in the region, the group discussion revealed that the development of adaptation strategies by farmers in the Bongo District is primarily a response to accelerating land degradation and soil erosion (i.e. insufficient soil moisture and fertility). Erratic rainfall patterns and dry spells were named as the second most important ecological factors which require farmers to develop improved soil and water conservation practices.

Two promising practices that are currently being applied to reduce surface runoff, control soil erosion and improve water quality are contour ridging and the use of Vetiver grass (*Chrysopogon nigritana*). Other successful techniques that were reported to have increased yields and soil fertility in the area include cereal-legume rotation and composting.

Yet, it was argued by some participants that local small-scale farmers are experiencing extreme difficulties while trying to produce an adequate amount of manure or compost for plots larger than one hectare. Infrastructural constraints in transporting compost to farmers' fields was seen as another primary obstacle that could potentially limit a more widespread adoption of agroecological adaptation practices.

Another key message that emerged from the debate was that most small-scale farmers in the district have no or very limited access to water for dry season irrigation farming. This problem significantly decreases households' adaptiveness and livelihood security in the face erratic precipitation patterns, prolonged dry spells, environmental degradation, and inadequate employment opportunities. During the discussion, AEAs agreed that the main water sources for irrigation during the dry season are household water (wastewater) and stored water from small dams and dugouts. These perceptions are largely confirmed in previous studies, for example by Namara *et al.* (2010, p. 9), who assert that informal irrigation systems such as small reservoirs in the UER are crucial for subsistence farmers, but often poorly managed and generally in a bad condition. By contrast, AEAs regarded other irrigation techniques such as shallow groundwater irrigation and pump irrigation as less relevant for most agricultural households in the district, with the notable exception of the Vea irrigation scheme, where commercially oriented dry season farming and pump irrigation are practiced on a larger scale (see Picture 4).

Picture 4. Pump Irrigation at the Veia Irrigation Scheme

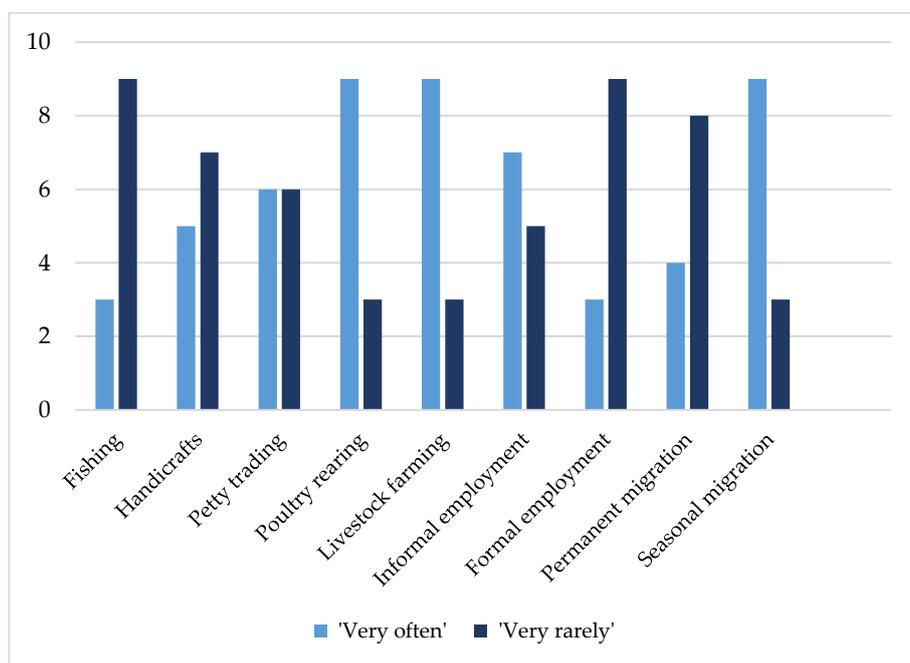


© Author, 2013

Despite the pervasive lack of economic opportunities in the formal sector, participants also agreed that the diversification of income streams through non-farm activities is a commonly practiced risk management strategy that is widespread in all strata of society. Rural farming households in the district, according to AEAs, are mostly reliant on income diversification through poultry rearing, livestock farming, informal employment and seasonal migration (see [Figure 8](#)). Small-scale economic activities that are officially promoted by the Bongo District Assembly – for example formal employment opportunities in the shea butter industry and handicrafts such as basket weaving – feature less

prominently in the perception of AEAs, despite the fact that the Bongo District is well known to export these products internationally.

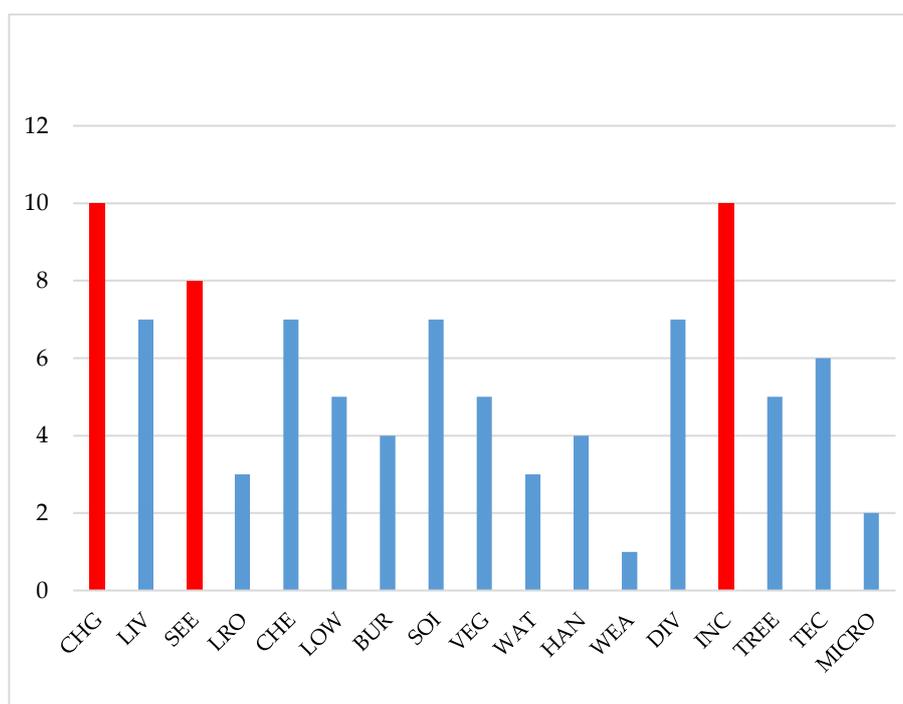
Figure 8. Perception of Farmers' Income Diversification Strategies by Agricultural Extension Officers in the Bongo District (n=12)



(Source: field work, Bongo, 2012)

When asked for an overview of agricultural adaptation techniques that were used 'very often' by farming households in the Bongo District, AEAs emphasized the changing of planting dates, the introduction of improved seeds and fast-growing crop varieties, as well as the intercropping of cereals and legumes (see [Figure 9](#), marked in red). Interestingly, these expert opinions largely cohere with studies on farmers' perceptions that have been conducted in the Sekyedumase, Gomoa East and Akuapim South Municipal Districts, respectively (Fosu-Mensah *et al.* 2012, Yaro 2013a).

Figure 9. Perception of Farmers' Adaptation Strategies by Agricultural Extension Officers in the Bongo District (n=12)



(Source: field work, Bongo, 2012)⁴¹

⁴¹ *Adaptation measures applied by farmers (from left to right):* changing of planting dates (CHG), introduction of more resilient livestock varieties (LIV), introduction of improved seeds and fast-growing crop varieties (SEE), land rotation (LRO), increased use of chemical fertilizer (CHE), cultivation in lowlands (LOW), avoiding the burning of bushes and crop residues (BUR), retention and incorporation of crop residue to improve soil fertility (SOI), covering vegetables with plants/grass (VEG), water storage for dry season vegetable farming (WAT), construction of hand-dug wells or boreholes for water supply during drought periods (HAN), use of weather forecasts (WEA), livelihood diversification (DIV), intercropping of cereals and legumes (INC), planting of trees (TREE), increased use of water and soil conservation techniques (TEC), use of formal and informal micro credit (MICRO).

Creating Subjects at Risk? The Politics of Indeterminacy

Traversing the seemingly rigid boundaries between the calculative logic of quantitative risk assessments and ideational approaches that perceive risk as being constituted by shared discursive practices is perhaps one of the most troubling tasks that this study has to confront. However, irrespective of the related theoretical difficulties that I have addressed in the conceptual part of this study, I maintain that an integrated perspective on the *social production of risk* is rewarding as it allows to see the notion of 'risk' as a subject of politics on the one hand, and as a means of creating political subjects (who are '*at risk*') on the other. Dynamic processes of political subject formation, in this sense, mainly function through the enactment of institutionalized rationalities and "normalized systems of representation which draw on the ideas and materials of risk" (Power 2014, p. 385).

According to this line of reasoning, I have applied the methodological repertoire of SKAD to illuminate the multiple ways in which subjects at risk are produced through discursive classifications and problematizations on the one hand, and the concrete materiality of landscapes and resource flows on the other. In defining the institutional organization of territoriality as the primary process through which social signification and the material world enter into a hybrid relationship, I have also extended the reach of SKAD as an empirical approach to dispositif analysis.

In the Ghanaian context, the analysis of the dispositif for adaptation revealed how institutionalized processes of financing and policy mainstreaming are presently affecting the translation and normalization of adaptation-related policies from the international to the district level. Moreover, in laying bare the structural impediments for the implemen-

tation of normative adaptation policies, I have shown how current attempts at increasing the adaptiveness of farmers and government organizations are constrained by the persistent quandaries of resource lack and unfinished decentralization.

An intriguing trope that emerges from the analysis of the official adaptation discourse in Ghana is what I would like to term the *politics of indeterminacy*. While adaptation is widely regarded as a window of opportunity to address national development priorities, adaptation policy narratives in Ghana are increasingly marked by notions of risk and uncertainty. These narratives can easily be linked to neoliberal rationalities of individualization and commodification – mainly as a result of their strong emphasis on *indeterminacy*. As Luigi Pellizzoni (2014, p. 203) argues:

Turbulence and contingency... do not mean paralyzing uncontrollability but lack of limits, room for maneuver, opening up of opportunities. The more unstable the world, the more manageable ... The contrast with traditional environmental and social science understandings of uncertainty could not be starker.

In other words, risk and uncertainty as well as the unfinished business of decentralization potentially function as enabling 'indeterminacies' for political and economic entrepreneurs, and open up new opportunities for regulatory capture and profiteering. If individualistic notions of participation, self-help and local responsibility are placed at the center of adaptation efforts – especially in an apolitical manner – these ideas might countervail the interests of poor and marginalized groups such as young people, landless sharecroppers and smallholder farmers who do not have reliable political networks to articulate their needs and ideas. The likely outcome of such regulatory capture by special interest groups is the accelerated commercialization of environmental resources in a way that is largely incompatible with wider principles of environmental sustainability and 'pro-poor' development at the

level of implementation. Overall, it is questionable whether a one-sided focus on large-scale agricultural modernization, export orientation and the application of hybrid seeds, inorganic fertilizers and pesticides is a feasible strategy for poverty reduction among poor smallholders. As Hesselberg (2013, p. 109) posits, it is hard to imagine "what kinds of agricultural higher-value non-staples northern Ghana can engage in that would enable successful exports on a larger scale." Moreover, it is to be expected that narrow mechanization and expansion strategies for rural transformations will result in the expropriation of smallholder farmers in areas with scarce land resources, thereby perpetuating existing social problems and potentially creating new ones.

A recent historical study of agricultural modernization projects in Ghana based on remote sensing techniques also finds that dominant narratives about unsustainable smallholder farming practices and subsequent environmental degradation are not necessarily reflecting the actual state of the environment. Instead, it is suggested that these crisis narratives are used as a political strategy to justify the redistribution of land from allegedly unproductive and unsustainable smallholder farmers to elite commercial farmers with links to global value chains, following the donor-driven call for a 'New Green Revolution' in Africa (Amanor and Pabi 2007, p. 65).

In their study of agricultural intensification in northern Ghana, Nyantakyi-Frimpong and Bezner Kerr (2015) also give us a glimpse of what is to be expected when the Green Revolution model of agriculture is applied on a larger scale. Not only do the authors find that high-input forms of agricultural intensification are reducing farmers' adaptive-ness and ability to take independent decisions about their own livelihood strategies. The authors also assert that external factors such as large-scale land acquisitions driven by local elites further undermine potentially resilient and diversified systems of agroecological food production. Therefore, it must be asked which innovative adaptation strategies could possibly be employed to avoid the marginalization of

smallholder farmers as well as the cooptation of natural resource regimes through so-called institutional "*triangles of accommodation*" that have emerged between (neo)traditional authorities, local administrative elites, and large-scale commercial farmers (Laube 2007, p. 324).

One possibility to increase the inclusiveness of adaptation measures in the agricultural sector is to improve access to credit schemes for marginalized smallholder farmers (Antwi-Agyei *et al.* 2015). As structured interviews with AEAs have revealed, formal and informal credit is still very difficult to obtain for many farming households in the Bongo District, thus limiting individual options for investment and non-farm income diversification (see Figure 9). The targeted channeling of financial support to farmers must hence be carefully assessed on a case-by-case basis – especially when it is combined with a politicized push for Green Revolution technologies – since the average farm household may be locked into an agro-industrial 'treadmill' where the "family must strive to produce more and yet more to satisfy the debt obligations of an agro-ecological model whose reproduction flows primarily through the circuit of capital" (Moore 2015, p. 16). Thus, the main political challenge is to find a proper balance between agricultural modernization, for instance with regard to improved irrigation facilities, and the increased support for less commercially oriented but potentially resilient food production systems. Instead of completely shifting the political focus away from small-scale farming, it seems prudent to strengthen smallholder agricultural systems and traditional crops that are historically well adapted to the northern savanna zone, especially in view of increased climate variability and future climate change impacts, as well as the current lack of economic alternatives.

Another viable alternative for supporting socially inclusive agricultural adaptation is the promotion of non-farm income generating activities that are, simultaneously, sensitive to income and power disparities, skills gaps and traditional gender roles. Yet, due to the fact that such ambitious support mechanisms strongly depend on enabling in-

stitutional structures and favorable market dynamics across scales, integrating adaptation with vulnerability and risk reduction measures has become a highly complex task. While elucidating perceptions of climate change adaptation based on structured and semi-structured interviews with professionals in the fields of environmental and development policy as well as disaster risk reduction, this complexity has clearly come to the fore. Structured interviews with NADMO district coordinators have shown that definitions of adaptation as adjustment to natural impacts currently dominate professional disaster risk reduction debates in the UER. This focus on adjustment adaptation may not be suitable to address some of the more systemic or structural problems of adaptation. Moreover, it has become clear that the indeterminacies of risk are not only an opportunity for political entrepreneurs to advance their special interests. Discourses about risk also play a role in creating new political subjectivities among affected populations, thereby closely mirroring the ideas and dynamics of international development discourses and funding priorities. During an interview with a senior official of the WRC in Bolgatanga, this process of political subjectification was described as follows:

Traditionally, we do not believe that any single member of society should be homeless. You are taken into another family, the whole community will be a source of support. Now, we have thrown in some English words, and we have called it *disaster*. The people see it as an occurrence, and we call it 'disaster' and put fear and panic in them. A *disaster* has come. Then we say National *Disaster* Management Organization. Go and manage the *disaster*. But they just carry a few bags of rice, some milk and sugar, and some mosquito nets. Then, the community begins to see the people who have been affected by such an occurrence as those whom the government has given rice ... The government has given you a mosquito net, you are now a *disaster victim* (laughs).

– Senior Basin Officer, White Volta Basin Office of the Ghana Water Resources Commission, Bolgatanga

It can be concluded from these observations that a discursive approach to institutional dynamics has been particularly valuable for exploring the socio-political production of risk. In the following chapter, I will complement this discursive perspective on expert perceptions of risk with a multi-hazard risk assessment. The overarching goal is to explore how households in the study area perceive risks, and to ascertain whether additional institutional determinants of risk can be identified empirically by focusing on processes of institutional territorialization.

CHAPTER FOUR: ASSESSING SITUATED AND RELATIONAL RISK IN THE VEA CATCHMENT

Drawing on a multi-hazard risk assessment (MRA), this chapter examines how the institutional organization of territoriality shapes the interplay between situated and relational risk. The MRA focuses on the institutional, physical and socioeconomic environment in which households are embedded, motivated by the primary goal to identify and evaluate risks as well as risk impacts. Using a mix of quantitative survey techniques and open-ended questions, household interviews were carried out in seven communities in the WASCAL research area. The selected rural and urban field sites allowed for a comparison between different farming and irrigation practices as well as between small-scale subsistence farmers, commercial farmers, and non-farm households. Moreover, facilitated group discussions were held in Vea with two separate groups, a men's group and a women's group. The overall aim of the discussion was to learn more about peoples' perceptions of risk and climate variability. The chapter concludes with an investigation of institutional territorialization processes to illustrate the complex interaction between risk exposure, hazards and the institutional organization of socio-spatial relations in the Vea Catchment area.

Overview of the Research Area: Socioecological Trends

The Upper East Region (UER) of Ghana is bordered by Burkina Faso to the north, and Togo to the east. The UER also shares internal borders with the Upper West and Northern Regions of Ghana. The population size of the UER is estimated to be 1,046,545, which accounts for 4.2 percent of the total national population (GSS 2013, p. 8). The largest ethnic groups in the region are the Mole-Dagbon, Gurma, Grusi and Mande-Busanga (GSS 2013, p. 34). The climate in the UER is classified as tropical, while the year is divided into two distinct seasons, a lengthy dry season spanning the months of October to April, followed by a rainy season that is stretching from May to September, with a mean annual rainfall between 800 mm and 1,100 mm (GSS 2013, p. 2).

Administratively, the UER is split into 13 districts. The city of Bolgatanga is the main economic hub as well as the regional capital of the UER, and also houses the Regional Coordinating Council. The UER's political landscape is generally marked by the pervasive presence of international development organizations, together with nongovernmental and civil society organizations. Local chiefs and other customary social institutions possess widespread legitimacy, and crucially influence patterns of social mobilization, despite the occasional occurrence of conflicts that involve (neo)traditional authorities.

Economic activities in the UER are characterized by low levels of income diversification, and 83.7 percent of all households in the region are engaged in agricultural activities that are highly vulnerable to climate change and increased variability (GSS 2012, p. 80). This socioeconomic situation makes the development of adaptation and risk management plans for local agricultural livelihoods all the more salient. Changes in the intra-seasonal variability of rainfall, in particular, have a strong impact on peoples' food security, as they negatively affect the

production of both cash and staple crops (Yaro 2013a). Available climate data for the UER show, for example, that dry periods during the rainy season have in fact increased (Riede *et al.* 2016).

Rainstorms and flash floods also occur frequently during the rainy season, at times resulting in the loss of lives. Particularly in the riparian areas along the White Volta, flooding events are worsened when the overflow of the Bagré Dam in Burkina Faso is released into the Nakanbé river (the Burkinabe stretch of the White Volta). Such regular flood and storm events certainly have an impact on food and nutritional security in the region. In some cases, they destroy staple crops which are grown during the rainy season and often serve as a household's food supply throughout the year. Chronic food and nutrition security remain pervasive throughout the region, especially during the so-called 'lean season' which normally peaks in April and May. It is assumed that 38 percent of the regional population are – to some extent – food insecure (CFSVA 2012, p. 19).

It is clear that these hazards not only constrain socioeconomic activities in the region, but also lead to increased health risks, displacement, and widespread damage to infrastructure and personal property. However, due to the complexities posed by intersecting risks, a causally simplistic and linear relationship between human vulnerability and environmental change should not be assumed. Environmental hazards may play only their part in deepening vulnerabilities associated with poverty, institutional structures, and social marginality (Schulz and Siriwardane 2016). Notably, data from the fifth and sixth round of the Ghana Living Standards Survey (see GLSS 5 and 6, 2005-2013) identify the UER as one of the poorest regions in the country, falling behind with regard to most human development indicators such as education, access to social services, and infrastructure provision. The regional percentage of the population defined as "extremely poor" (below the extreme poverty line of 792 GHS) is 44.4 percent, while the percentage of the population classified as "poor" (below the absolute poverty line of 1.314 GHS) comprise 21.3 percent (GLSS 6 2014a, p. 15-16). At the same

time housing quality is well below the national average, and only a quarter (24.1 percent) of the regional population have access to electricity (GSS 2013, p. 149). All in all, these aspects are likely to exacerbate the impacts of even 'minor' climate related hazards.

Thus, despite the progress that Ghana has made over the past two decades with regard to economic development and improved living standards, the north still lags behind due to the limited number, variation and quality of household assets, and because of widespread income insecurity and poor health standards. As a result of high population density, arable land is relatively scarce in the region, which is often seen to be a major reason for environmental degradation.

Against the backdrop of pervasive poverty, risk exposure levels are also determined by age and gender-related factors. Women form the majority of the poor since they are primarily working in the two 'hotspots' of Ghanaian poverty – namely, the agricultural sector and the informal economy (ILO 2005). This pervasive social pattern is often claimed to be a consequence of socio-cultural factors and categorization, resulting in limited access to productive resources such as land (Quaye 2008). Women in general are seen to be more dependent on natural resources for their livelihoods, while access to these very resources is mediated through gendered roles and norms that tend to disadvantage women, both materially as well as relationally. The younger and older segments of society are also at a disadvantage, for they are subject to cultural norms similar to those that deny women access to productive resources (i.e. 'social invisibility') (Chant and Jones 2005, Vanderpuye-Orgle and Barrett 2009).

In sum, the historic 'underdevelopment' of the UER has often been attributed to colonial legacies, pervasive shortcomings in development policies, and 'neoliberal' structural transformations that gradually altered the socio-cultural and economic character of the region, especially by making way for trajectories of greater liberalization and individualization (Yaro 2013b). In the same vein, statistical data reveal that

population loss as a result of labor migration progresses at a "fast rate" (GSS 2013, p. 169). This pervasive pattern of outmigration can certainly be ascribed to concomitant economic, population-related and environmental pressures. Yet it must be borne in mind that out-migration also has deep-rooted cultural and historic origins that need to be considered, such as customary payments and other forms of societal expectations related to marriage arrangements (Sow *et al.* 2014).

Multi-Hazard Risk Assessment: Applied Methods

Data for the multi-hazard risk assessment were collected in the Vea Catchment area between 2012 and 2013 (see [Map 4](#)). In preparation of the MRA, job interviews with potential field assistants were held in the district capital of Bongo. Five field assistants who had previously gained experience with the administration of survey forms were hired to conduct interviews and provide translations. Before the household survey was officially rolled out, several training sessions took place. The goal was to discuss the selection of field sites as well as the translation of survey questions into the local languages. A pilot study was then carried out to test the accuracy of translations and solve the remaining practical problems that emerged during the first few interviews.

Since the target population in the Vea Catchment area is generally dispersed across a relatively wide geographic region, time and budget constraints did not allow for a simple random sampling approach. Instead, the study utilized a multi-stage sampling approach. Lists of all census areas in the in the Bongo and Bolgatanga Municipal districts were obtained from the local Planning and Coordination Units. Based on consultations with planning specialists, all census areas located in

the Veia Catchment (110) were identified, and subsequently stratified into rural and urban areas (see [Annex 3](#)). It was ultimately decided to determine the status of a specific census area by population size, whereas census areas with 5,000 or more inhabitants were classified as 'urban'. A simple random sampling approach was then used to select five census areas from the rural stratum as well as two census areas from the urban stratum.

Table 7. Rural and Urban Households in the Veia Catchment Area

Total number of households in the Veia Catchment area	27.098 HH
Total number of urban households in the Veia Catchment area	11.028 HH (40.7%)
Total number of rural households in the Veia Catchment area	16.070 HH (59.3%)

(Source: MLGRDE, data for the year 2000)

Due to the fact that recent information about the precise number of households per census area was not readily available at the time of the study, and since official numbers dated from the year 2000, an enumeration exercise constituted the first phase of the household survey (see [Table 8](#)). After the enumeration had been completed, 484 out of 759 households in seven census areas were surveyed based on a simple random sampling approach, assuming an unchanged distribution rate of rural and urban households within the Veia Catchment (59 percent rural and 41 percent urban, see [Table 7](#)). All household interviews were anonymized. Participants were previously informed about the study background and asked for their explicit consent to ensure maximum compliance with ethical standards (see [Annex 2: Core Ethics Principles for Field Work](#)). No participants below the age of 18 were involved in the study, and only the heads of households were interviewed. Moreover, it was ensured that half of the interviews took place during the

dry season to achieve more balanced results. This procedure was extremely time intensive, and sometimes required enumerators to revisit households where the head of the household was not at home at the time of contact. Interviews with household heads who were involved in farming activities occasionally took place near the farmers' fields, and it was made sure that the daily routines or economic activities of participants were not unnecessarily interrupted.

Table 8. Selected Communities in the Vea Catchment Area

Community	District	Enumeration	Sampled
1. Yikene Adohbisi	Bolga rural	38	36
2. Zaare Amoabisi	Bolga rural	132	114
3. Vea-Gunga	Bongo rural	107	81
4. Namoo-Akunka	Bongo rural	33	33
5. Vea Irrigation Project	Bongo rural	170*	20
6. Bolgatanga-Sawaaba	Bolga urban	131	120
7. Bolgatanga-Damweo	Bolga urban	148	80
	TOTAL	759 HH	484 HH
	RURAL	480	284 (59%)
	URBAN	279	200 (41%)

(Source: field work, Vea Catchment, 2012-2013; *The total numbers for the Vea irrigation project refer to a *core group* of 170 commercial farmers with plots that are larger than 2 ha, and not to the total number of 2,000 farmers who farm on project land)

In addition to the household survey, a facilitated group discussion was held in Vea with two separate groups, a men's group and a women's

group. A separation between men and women was deemed necessary to ensure that all participants would express themselves as freely as possible. The overall aim of the group discussion was to learn more about peoples' perceptions of risk and climate variability. Group discussions were formally arranged during a preliminary audience at the palace of the chief of Vea. After being informed about the exact research aims, the chief and his elders generously agreed to apprise the neighboring communities about my plans to organize a public meeting, and to encourage people to attend. The meeting took place at a community center in Vea, which had been deemed suitable to host a larger number of participants. A local food vendor was engaged to cater for the participants during the event. The facilitation of discussions was mainly entrusted to my field assistants, who also provided the necessary translations.

Findings of the Quantitative Household Survey

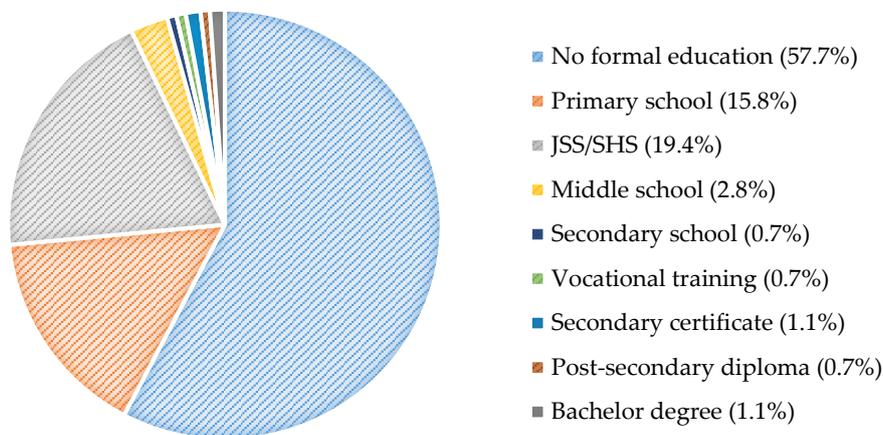
Demographic Data

Demographic data obtained from the household survey indicate that the average age of household heads within the rural stratum was 44.1, whereas the average age of urban household heads was 39.1. The sex distribution among household heads in rural (68.7 percent male and 31.3 percent female) as well as in urban areas (64.5 percent male and 35.5 percent female) demonstrates the predominance of male headed households in both strata, which is largely coherent with the overall demographic situation in the UER (GSS 2013, p. 37). Moreover, it was found that the average age of commercial farmers within the rural stratum was 41.2, and that the heads of those households who were en-

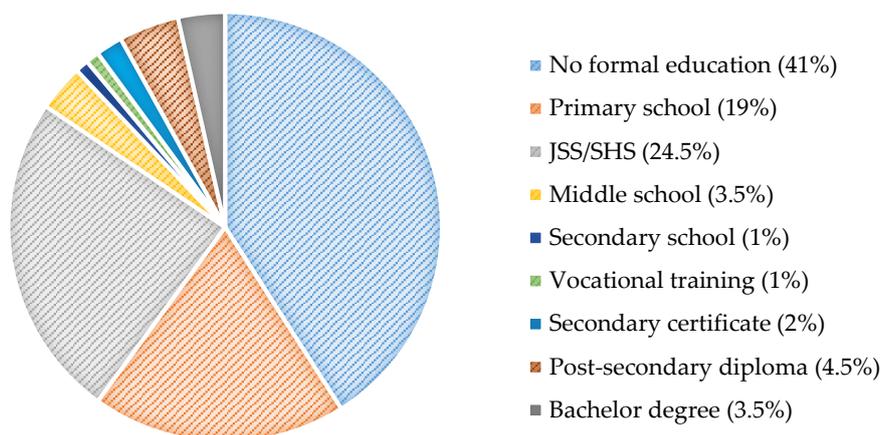
gaged in commercial farming at the Vea irrigation project were exclusively male. The average household size in urban areas was 5.1 persons, while households in rural areas were found to be slightly larger, with 6 people on average. These findings largely cohere with the average household size for the region, which is 5.2 for urban and 6.1 for rural areas, according to the latest census data (GSS 2013, p. 37).

The level of formal education in the research area is generally low. Figures 10 and 11 illustrate that almost 58 percent of all rural and 41 of all urban households did not benefit from formal education at all. These findings have serious implications for the adaptiveness of households and individuals. Awareness raising and other educational activities, for example in agriculture and economic management, must be tailored to address a population which is, to a considerable extent, unable to read and/or write, while economic and environmental conditions are putting high pressure on local livelihoods.

Figure 10. Highest Level of Formal Education in the HH (Rural)



(Source: field work, Ve a Catchment, 2012-2013; n=284 HH)

Figure 11. Highest Level of Formal Education in the HH (Urban)

(Source: field work, Veia Catchment, 2012-2013; n=200 HH)

Methodologically, a possible shortcoming of the study is the exclusion of individuals below the age of 18 due to ethical considerations. However, available statistical data show that the percentage of household heads in the age cohort between 0-19 years of age is comparatively low at the regional level (1.1 percent) (GSS 2013, p. 37). Accordingly, it is assumed that the exclusion of this age group does not significantly alter the results of the survey.

Housing Conditions

Housing conditions and architecture are important determinants of well-being and adaptiveness. At the same time, they significantly influence social vulnerability. Dwellings in the predominantly rural Veia Catchment are mostly rooted in the vernacular architectural traditions of the northern savanna, and represent local cultural identities as much as they reflect functional necessities and physical constraints. Historically, communities in the northern savanna zone have been regularly

exposed to attacks by slave-raiders, threatened by animals or intervillage warfare, and were subjected to punitive raids undertaken by the colonial authorities (Swanepoel 2008). Thus, safety considerations and the enhancement of defensive properties can be seen as major reasons why traditional buildings were constructed as semi-fortified compounds.

The typical compound is entered through a main gate that faces away from the weather side to protect the house from harmattan winds and passing rain showers. Behind the main entrance gate, traditional compounds frequently open up into a cattle yard with several fowl coops and the so-called *zong* or *zongo*, a meeting hall and ritual room that is used for ancestral worship, funeral rites, receptions, relaxation as well as the observation of the immediate surroundings (Gabrilopoulos *et al.* 2002, p. 230). After passing through the entrance area, one normally faces several rooms for sleeping, cooking and storage, which are separated according to sex and social hierarchy, and structured around one or several general-purpose courtyards (Gabrilopoulos *et al.* 2002, p. 230). In the courtyard(s), one also encounters ancestral shrines, mortars for the pounding of grain, and granaries for storage. Vegetables, trees and crops are usually grown in the immediate proximity of a compound, including crops such as millet, which are used for traditional cultural purposes and ceremonies. Animal husbandry in the Veia Catchment is mostly focused on sheep, goats, cattle, pigs and poultry such as guinea fowl. Population pressure and land scarcity in the area have also necessitated the use of short-fallow bush farms, which are normally located several kilometers from the main compound.

The most common materials for the construction of outer walls in the study area (n=484 HH) are mud-bricks (56 percent), while cement blocks are more frequently used in urban environments (39 percent overall). Common roofing materials to date are metal sheets (86 percent), even in the rural parts of the Veia Catchment, although such building materials are generally more expensive than mud-bricks/clay (3.3 percent) or grass thatch roofing (2.7 percent), and thus reflect the

social status of the house owner. Moreover, metal roofing is fireproof and requires less maintenance, even if its insulating qualities against heat and cold are inferior in comparison to traditional roofing materials such as thatch (Drucker-Brown 2001, p. 671). Concrete structures with roofing tiles and multistoried commercial or administrative buildings are also a common sight in expanding peri-urban residential areas and urban settlements such as Bongo or Bolgatanga.

Findings show that roughly half of all households in both urban and rural areas (52.5 percent) have access to electricity, although power outages are a regular occurrence. The main sources of water for household consumption are pipe-borne water (31.4 percent), and water from boreholes or wells (68.6 percent). Household waste is normally disposed or burned in the immediate surroundings of settlements. In urban areas, the indiscriminate disposal of solid waste frequently leads to the blockage of drainage pipes, which can prove fatal in the case of flooding or torrential rainfall.

Picture 5. Typical Vernacular Architecture in the Research Area



© Author, 2013

Generally, heavy rains and floods constitute major risks in the study area. Traditional mud-brick structures are often not able to withstand storms, torrential rainfall, and the resulting flash floods. Hence entire buildings or single rooms frequently collapse, while roofs are torn from buildings (see Picture 6). Tall crops and grasses such as okra, kenaf or millet, which are often planted in the immediate vicinity of buildings, only provide rudimentary protection against such risks.

Picture 6. Storm Impact in Bolgatanga, Upper East Region



(Source: NADMO, Bolgatanga, 2011)

Agriculture, Irrigation and Income Diversification

Agriculture is a key livelihood activity for the vast majority of rural households in the study area (96.6 percent). By contrast, the picture is drastically different in urban areas, where only 3.5 percent of all participants indicated that agricultural activities are the 'main source of livelihood' for the household. What needs to be asked in view of these

findings is whether urbanization and the diversification of non-farm income sources should be seen as directly linked?

To begin with, there is certainly evidence to suggest that agricultural land in the research area is lost through urbanization processes. Urban sprawl and population growth potentially contribute to the degradation of natural resources such as soil and water in formerly rural environments, thus increasing overall pressure on the natural resource base and accelerating land use competition (Kuusaana and Eledi 2015). The high incidence of non-agricultural livelihood strategies in urban spaces can, therefore, be attributed to a complex mix of rural transformation processes, social networks and dynamic mobility patterns that traverse artificial rural-urban boundaries. Furthermore, it must be borne in mind that the political clout of authorities and specific settlement histories play an important role with regard to the creation of economic opportunities in a particular place.

How people can make use of emerging economic opportunities also depends on factors such as family size, education, socially stratified access to value chains or organizational support (Yaro 2006). Previous research on dynamic urbanization processes in northern Ghana has shown that livelihood diversification does not automatically translate into higher wages and income security. Unemployment and low paying jobs in the informal economy are still the norm in urban centers like Bolgatanga, despite the fact that many households are engaged in horticulture and small-scale farming activities to supplement their income and increase food security (Schulz and Siriwardane 2016, p. 183).

Hence it cannot be generalized from the initial survey findings that a higher degree of livelihood diversification is only typical for 'urban' environments, or necessarily more beneficial in terms of increasing adaptiveness. Livelihood diversification is neither a progressive shift from one static livelihood pattern to another (e.g. from farming to non-farm activities), nor can it be separated from complex processes of institutional territorialization. What can be concluded instead is that

dynamic livelihood patterns, individual livelihood choices and socio-environmental risks are profoundly structured by institutional factors. Simply distinguishing between rural/urban or farm/non-farm livelihood activities is not sufficient to capture this complex and interrelated nature of livelihood portfolios (Yaro 2006).

In addition to income diversification, another factor that is frequently mentioned in the literature as a key determinant for household adaptiveness is landholding size (for an overview, see Chamberlin 2008). Results indicate that rural households who are engaged in agriculture as a key livelihood activity are predominantly smallholder farmers, defined as farming households who cultivate plots of less than 1 ha per season. In rural areas, the average plot size was found to be 0.93 ha per household, while households in the rural stratum with access to a larger irrigation scheme reported an average plot size of 2.0 ha.

The concrete effects of institutional territorialization and resulting potentials for income diversification may nevertheless differ profoundly within the so-called 'smallholder' spectrum of agriculture, for instance according to macroeconomic conditions and structural factors such as access to infrastructure, labor, fertile land, education, markets, as well as agricultural services and inputs. Moreover, it needs to be taken into account that traditional cultural institutions play an important role for land use practices and the allocation of land. Access to fertile land, especially to exclusive plots that are located within irrigation schemes, is strongly mediated by financial resources, social networks, and traditional gender roles. Overall, female headed households are at a disadvantage when it comes to the allocation of land and agricultural inputs. In comparison to their male counterparts, female headed households usually own less assets such as agricultural equipment or animals that produce manure for the fertilization of fields. In line with customary norms, land is allocated to males only, normally by the local earth priest or chief, and females have no right to inherit land. However, in practice at least "unmarried, divorced, or widowed women are always

allocated a portion of the household land for farming purposes" (Tonah 2008, p. 117).

Moreover, there are some exceptions to this rule if male individuals decide to lease land in the name of their female family members, which usually requires substantial financial resources and a reputable job, for example as a government employee. Alternatively, a man may also lease land in his own name, and pass it on to his wives or daughters. For Ghanaian nationals, the maximum lease period for a particular tract of land is 99 years (Interview at the WRC in Bolgatanga, 2013). Family land, by contrast, is strictly passed on in accordance with the traditional patrilineal inheritance system. Thus, when it comes to the ownership of land, the male inheritor usually holds the land in trust for the family and does not have the right to give it away without the knowledge or agreement of the other family members. Concerning the relationship between land tenure and gender, it must therefore be considered that dynamic cultural and economic institutions have created two parallel systems, the monetary leasing system on the one hand, and the traditional patrilineal system of family inheritance on the other. Hence it can be concluded that traditional institutions and gender roles still play an important role in terms of perpetuating existing power asymmetries, while economic factors are becoming increasingly important as determinants of social stratification.

Agricultural land use in the study area is mainly centered around agropastoral smallholder cropping systems and the cultivation of traditional staple crops such as millet and sorghum that are grown during the wet season for domestic consumption. Animals such as sheep, goats, cattle and poultry are fully integrated into the farming system, at least if households can afford to keep them, for example by using animal manure for the fertilization of fields, and as an 'asset' that can be sold during the lean season or in times of hardship. Cash crops such as rice and tomato are also cultivated during the dry season in case irrigation options are available, primarily by men, to increase the available income for reinvestment and consumption. Normally, cropping

and (re-)investment proceed in a cyclical fashion. Traditional staple crops that are cultivated during the wet season are used to finance dry season production, whereas dry season revenues are in turn used to obtain inputs for wet season farming. Harvest losses or minimal returns during one season can therefore seriously affect livelihood outcomes. The annual cropping cycle for staple crops normally starts at the beginning of the year, sometimes with land clearing based on 'slash-and-burn' practices, and is followed by land preparation (see [Table 9](#)). Most smallholders depend on hired or communal labor for land preparation, because mechanical equipment is hardly available and/or affordable for the majority of farmers in the region. Precarious financial conditions thus present another major risk, since farm inputs such as inorganic fertilizers that are needed for land preparation are hardly attainable for many smallholders. Planting usually starts when the rainy season sets in, and is generally a risky business due to the volatility of local climatic conditions.

Picture 7. Land Preparation in the Bongo Area



Agricultural livelihoods in the region are thus characterized by a mix of unfavorable climatic conditions and unsustainable farming practices, which are widely adopted due to a lack of economic alternatives. For example, farmers' fields were usually left to fallow after several years to protect the fertility of soils. Yet fallow periods are now becoming increasingly shorter due to economic and population pressures – if they are not entirely disregarded – which has led to a strong decline of soil fertility and reduced organic matter content in soils. Moreover, as Heve *et al.* (2016, p. 1) observe, climatic conditions in the northern savanna zone “limit crop productivity, biomass accumulation and consequently lead to low soil cover and increased frequency of soil exposure to wind, runoff and erosion, which, in turn, reduce topsoil depth.”

Table 9. Schematic Cropping Calendar for Typical Staple Crops

Operation/activity	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Land Clearing		←→										
Land Preparation				←→								
Planting					←→							
Filling-in					←→							
1st Weeding					←→							
Fertilizer Application					←→							
2nd Weeding						←→						
Transplanting						←→						
Top Dressing							←→					
Re-shaping/Earthen-up								←→				
Harvesting									←→			
Drying/Processing										←→		
Storage											←→	

(Source: MOFA, Bolgatanga, 2013)

Taken together, these livelihood risks have a considerable impact on food security, especially for small-scale subsistence farmers who depend on rainfed agriculture during the wet season. Despite the fact that the overall food security situation in northern Ghana has improved over the past several decades, seasonal food shortages still present a serious problem. Yet, during a group discussion that was held in Veia participants initially disagreed on whether food insecurity in the area is most prevalent from November to December or from March to May. Eventually, a consensus was reached that the period between March and May should be regarded as the most challenging time (or 'lean season') for most households in terms of food security.

Table 10. Food Security Calendar

Month	1	2	3	4	5	6	7	8	9	10	11	12
Early millet							ooo oo	ooo	oo	o	o	
Guinea corn									ooo oo	oo oo	oo	o
Ground-nuts										ooo oo	oo oo	oo
Late millet												
Rice	oo	o								ooo oo	oo oo	ooo
Okra							oo oo	ooo				
Kenaf						ooo oo	oo oo	ooo	oo	o		

(Source: field work, Veia, 2013)⁴²

Older participants also pointed out that precipitation patterns in the region have changed drastically compared to the 1980s. In particular, they observed that the rainy season now starts in May or even June

⁴² The food security calendar is based on a discussion with a women's group in Veia. The small circles indicate the availability of various foodstuffs throughout the year, ranging from one circle (almost none) to five circles (plenty).

instead of April, which was considered a serious problem for food security because of the unreliable and erratic nature of rainfall and resulting crop failures.

While regional climate data do not clearly confirm such an overall shift in the onset of the rainy season, or at least not a shift that goes beyond naturally occurring climate variability, there are still robust signals for an observable rise in temperatures together with an increase of dry spells during the wet season (Riede *et al.* 2016). In combination with unfavorable socioeconomic conditions, converging environmental hazards such as land degradation, drought, floods and erratic rainfall patterns have serious negative impacts on local livelihoods.

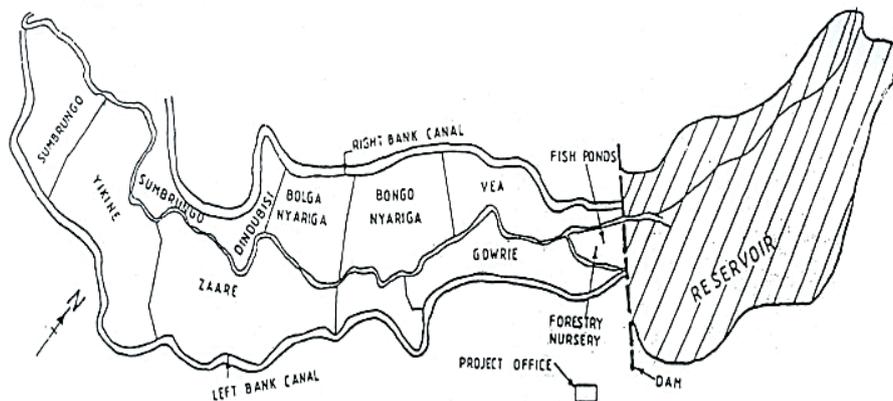
Accordingly, access to irrigation facilities seems to be an important factor for the adaptiveness of smallholder farmers who mainly depend on rainfed agriculture for their livelihoods, and often need to engage in precarious economic activities during the dry season to complement their income and ensure food security. During the dry season, smallholder farming activities in the catchment area are mostly centered around rivers and small water bodies where pump irrigation and bucket irrigation are practiced. The most common dry season irrigation techniques outside of larger irrigation projects are the use of wastewater and stored water from small dams, boreholes, or hand-dug wells. Survey results show that 46.1 percent of the predominantly rural households who indicated agriculture as their 'main occupation' had the means (access, finance and required labor capacity) to capitalize on some form of dry season irrigation. Among these households, 10.6 percent had direct access to the surface-water gravity-flow system at the Veia irrigation scheme.

Yet, irrigation efficiency is rather low on average, while purchasing the necessary equipment and fuel for motor pump irrigation is too costly for most subsistence farmers (Agyare *et al.* 2009, p. 266). Irrigation levies and land use fees charged by local landlords for dry season farming

near rivers further exacerbate existing social inequalities. Reliable access to dry season irrigation, especially at larger irrigation projects, is therefore tightly linked to disposable income, and also hinges on personal relations with the irrigation bureaucracy that is responsible for the allocation of irrigated plots. However, the question that needs to be asked at this point is whether access to larger tracts of land at commercial irrigation projects should be seen as a key solution for improving household adaptiveness?

As mentioned in the opening case study, one of the most important infrastructures for commercial dry season farming in the study area is the Veia irrigation project, which is managed by the government-funded Irrigation Company of Upper Region Ltd. (ICOUR). The Veia irrigation project is located near the town of Veia, about 10 kilometers away from the city of Bolgatanga. The Veia irrigation facilities, together with a reservoir and an earth-filled dam, were built between 1965 and 1980 for multiple purposes such as dry season farming, small-scale fisheries and the provision of drinking water.

Map 4. The Veia Irrigation Project



(Source: ICOUR; also see: Kusi 2013)

The total area developed for irrigation is 850 ha during the wet season, and roughly 400 ha during the dry season. The Veia reservoir is directly fed by the Yaragatanga river. Currently, a core group of 170 commercial farmers with plots larger than 2 ha have been allocated land between the 14.5 km long left bank canal (129 farmers) and the 11.3 km long right bank canal (41 farmers) of the irrigation scheme (Map 4; interview at the ICOUR project office in Veia, 2013). In total, the irrigation project is said to support around 2,000 farmers (Ofosu 2011, p. 84). Crops and legumes under cultivation include rice, tomato, cowpea, onions, soybeans and 'pepper' during the dry season, as well as groundnuts, sorghum/millet, rice and maize during the wet season. The project facilities also include various fish ponds that cover a total area of 3.2 ha. The most common irrigation technique practiced by project farmers in the upland areas of the irrigation scheme is furrow or pump irrigation, whereas farmers in lowland areas simply irrigate their plots by flooding (Ofosu 2011, p. 87).

With regard to the maintenance of the irrigation scheme, the opening case study has shown that no major rehabilitation work has taken place since the completion of the Veia dam in the 1980s. This problematic situation, exacerbated by unsustainable agro-pastoral practices and torrential rainfall events, has led to the slow erosion of the walls of the Veia dam, and resulted in the siltation and blockage of irrigation canals and drainage systems (Adongo *et al.* 2014). Higher average temperatures, together with wind erosion and evaporation caused by a loss of vegetation cover and the weak enforcement of buffer zone policies have also led to a decrease of water levels in the reservoir (Eickhof 2010, p. 104). As a consequence, many small-scale farmers were forced to abandon their farmlands because of a lack of water supply for dry season farming, or had to resort to costly motor pump irrigation in the upland areas of the irrigation scheme. Despite the ingenuity of local farmers who need to cope with constantly falling water levels, these converging problems seriously reduced the overall production capacity of the irrigation project. Data provided by the Irrigation Company

of the Upper Region Ltd. (ICOUR) for the period from 2001-2012 confirm that cropping outputs at the Veia irrigation scheme were consistently lower than the desired cropping targets (see [Annex 3](#)). Volatile climatic conditions, insufficient maintenance, unsustainable farming and user practices, as well as latent sociopolitical conflict since the construction of the irrigation scheme have thus created a difficult environment for dry season farming in the research area (see [Konings 1981](#)). Furthermore, since available land at the Veia irrigation project is scarce and much sought-after, members of the ICOUR bureaucracy have become influential political entrepreneurs who are able to capitalize on the prevailing 'politics of indeterminacy' (also see [Laube 2009](#)).

Thus, concerning the initial question of whether access to larger plots of land at an irrigation project should be seen as a key solution for improving household adaptiveness, it can be said that at least in terms of ensuring food security, access to irrigation alone does not seem to be the decisive factor. As the survey results show, seasonal food insecurity among rural households is extremely high (92.6 percent), and it is nearly as high among households who have direct access to the Veia irrigation scheme (90 percent). Urban households, by comparison, are still food insecure, but at a relatively lower rate (64 percent).

These findings provide a first glimpse on how institutional dynamics are presently shaping the territorialization of risk as well as the adaptiveness of households in the Veia Catchment area. The following section seeks to extend these preliminary insights by further investigating how diverse livelihood risks are distributed among urban non-farm households, rural subsistence farmers, and farmers with access to the Veia irrigation project. In other words, to fully address the main question that guides this inquiry, namely whether institutions are the key factor that determines social vulnerability in the research area, it will be vital to closely examine how households are embedded in networks of social institutions and organizational support mechanisms.

*Determinants of Adaptiveness? Organizational Support,
Social Institutions and Implications for Food Security*

It has become clear from previous results that complex patterns of institutional territorialization play a major role for climate change adaptation in Ghana. What can be recognized so far based on empirical evidence is that social institutions and organizational support mechanisms are at the heart of adaptation processes due to their important role in shaping vulnerabilities and risks. Specific organizational configurations may either enable or constrain people's adaptiveness and livelihood choices, for example by mediating access to material and symbolic resources, and by influencing the ways in which these material or symbolic resources are used. Social institutions, in turn, crucially affect relations of reciprocity and territorial (i.e. socio-spatial) relations through, for instance, governing labor arrangements in the agricultural sector.

Concomitantly, to better understand the interplay between relational livelihood risks and institutional environments, particularly with regard to specific socio-spatial configurations in the Veia Catchment, it is crucial to explore under which circumstances households might or might not be able to rely on social institutions and organizational support mechanisms to increase their adaptiveness. Therefore, as a first step, risk profiles have been created for urban households, rural households and farming households with access to the Veia irrigation scheme based on the results of a quantitative household survey (Figure 12). The overall survey design is rooted in locally situated categories of risk – so-called 'emic' categories – that have been co-developed with participants during preliminary field interviews in order to avoid biased responses to prefigured definitions of risk. This overall approach takes into consideration "that the strategy people adopt to deal with climate change is highly dependent on what they think and believe is happening" (Yaro *et al.* 2016, p. 77; also see Teye *et al.* 2015).

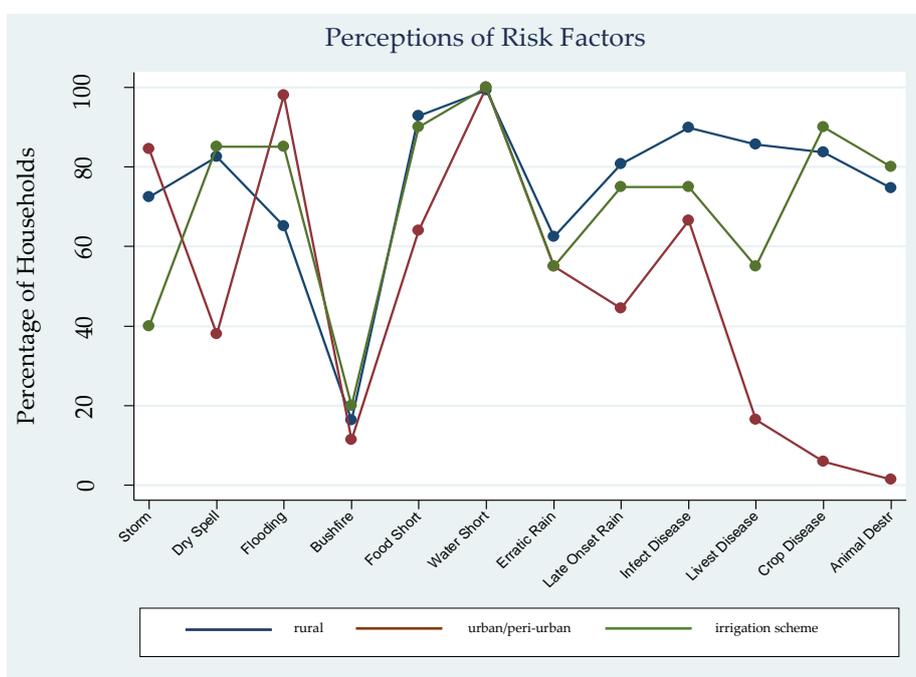
Initially, a direct comparison between the risk perceptions of local household heads and government specialists in the Bongo and Bolgatanga Municipal Districts revealed that household heads considered food shortages a more severe risk than NADMO district staff. It is also interesting to note that water shortages did not feature at all in the perceptions of DRR specialists, while participants in both urban and rural areas ranked water shortages particularly high among the risks they claimed to be exposed to.

These diverging perceptions may be explained by the limited political mandate and organizational capacity of NADMO. As the *dispositif* analysis in the previous chapter has revealed, the emphasis of regional DRR activities is mainly on disaster prevention and relief efforts. It is not, however, on the planning and local implementation of adaptation programs and sustainable development projects with a focus on, for example, water security. Thus, despite the fact that the NCCP explicitly mentions water availability, quality and access as key policy goals for development interventions in general (and integrated DRR and CCA measures in particular), the overall situation remains problematic in the view of most households.

In addition, the results point toward another noticeable discrepancy between expert perceptions of risk and the views of local households. Bushfire outbreaks ranked relatively high on the agenda of DRR authorities in Bongo and Bolgatanga, whereas rural and urban households alike deemed bushfires to be of far lesser importance. As Nsiah-Gyabaah (1996, p. 24) argues, one possible explanation for these divergent risk perceptions of DRR specialists and local households is the fact that annual bush burning is "deeply embedded in the cultural values and traditional farming systems of the people" in northern Ghana, mainly in the context of land clearing practices.

Yet, the survey also showed that known vulnerabilities continue to exist in cases where a tight alignment between national policy priorities

and the risk perceptions of district-level officials and affected households can be observed. Households at the urban fringes of Bolgatanga almost collectively stated that they were seriously affected by recurring flood events, either as a result of riverine flooding or due to torrential rainfall. These risk perceptions were shared by about 60 percent of all rural households and by more than 80 percent of households with access to the Veia irrigation project. Likewise, storm risks were deemed to be highly relevant by rural and urban households alike.



Source: own field work, Bongo and Bolgatanga, 2012-2013. Total number of surveyed households: 484; rural: 264 (100%); urban/peri-urban: 200 (100%); irrigation scheme: 20 (100%).⁴³

⁴³ Risk categories (from left to right): storm, dry spell, flooding, bushfire, food shortages, water shortages, erratic rainfall, late onset of rains, infectious diseases, livestock diseases, crop diseases, animals destroying crops.

While these risk perceptions are in line with the DRR policy focus of the NCCP (2013, p. 31) and reflect the high priority that is accorded to flood and storm risks by NADMO district officials, it is evident that precarious agricultural livelihoods and unstable income sources together with the patchy implementation of DRR and CCA measures have a strongly negative effect on peoples' adaptiveness.

In addition, a number of other interesting differences and similarities between the risk perceptions of rural households, urban households, and households with direct access to the Veia irrigation scheme emerge from the survey. One of the most salient similarities between different types of households is that agricultural risks such as erratic rainfall patterns and the late onset of rains were perceived as almost equally relevant by both, rural and urban households. Similarly, dry spells were not only regarded as a significant risk by rural farming households, but by many urban households as well (nearly 40 percent).

This means that erratic precipitation patterns and more frequent and intense dry spells during the rainy season are not only a major risk for rural households who depend on wet season crop production as a key livelihood activity. During interviews, it was confirmed that urban households also saw rainy season horticulture as a viable strategy to supplement their food resources and income. Surprisingly, however, urban households perceived risks such as livestock diseases, crop diseases and the destruction of crops by animals to be less important for their livelihoods, while rural households identified the same risks as very relevant. This interesting difference can arguably be explained by the comparatively minor role of agriculture and livestock keeping as *primary* livelihood activities for urban populations.

At first glance, it may be thus concluded from this broad comparison of risk perceptions that there is a relatively close match between the priority risks of government organizations and affected households, indicating that the mainstreaming of adaptation policy priorities is not completely out of tune with local risk perceptions. However, national

adaptation policy guidelines have not yet been translated into more integrated implementation efforts. The main reasons for this implementation gap are certainly limited organizational capacities, limited political mandates, as well as a lack of financial means and political will. At the same time, it is evident that donor-driven efforts at 'mainstreaming' CCA into DRR planning at the district level primarily resulted in interpretations of adaptation as adjustment to environmental stressors, whereas attention for the social production of risk – both materially and discursively – was comparatively low.

Moreover, as soon as social institutions are included in the risk assessment, a far more complex picture emerges. For example, social institutions are perpetually transcending place-based notions of risk as well as rural-urban dichotomies through "teleconnections" or links between the "urban and rural ends of a pathway" (Seto *et al.* 2012, p. 7690). One of the most important teleconnections that plays a role in this regard is the transmission of remittances. Overall, 20.8 percent of all rural households and 16.2 percent of all urban households confirmed that they had received remittances for at least 3 months of the year, either from within the country or from abroad.

These results stand in marked contrast with previous studies that were conducted in the Bolgatanga Municipal and Bongo Districts and report a much higher reliance on remittances, occasionally of more than 50 percent (see, for example, Yiran 2016, p. 226). However, there are several possible explanations for this discrepancy. On the one hand, income is a sensitive issue, and participants may either over- or underreport sources of household income for various reasons. What is more likely, on the other hand, is that the ability of migrant laborers to send remittances to the north is dwindling due to increasingly limited economic opportunities as well as inadequate wages for unskilled laborers and aspiring youth in urban centers (World Bank 2015b, p. 36; also see Laube 2016, p. 130). Since some of the urban populations that were interviewed for this study are located at the outskirts of Bolgatanga, it is

also likely that the reliance on remittances is lower in these areas than in the urban core. The main argument in favor of this assumption is that the social composition in the peri-urban areas of Bolgatanga indicates a concentration of socially disadvantaged groups at the outskirts of the city (for a more detailed study, see Schulz and Siriwardane 2016).⁴⁴

Concerning the nature of social institutions in general, a trend toward greater individualization and monetized communal relations has been observed for Ghana. A previous study by Yaro (2013b, p. 421), for instance, notes a pervasive change in social norms and values, exemplified by *"emerging cracks in the 'collective' philosophy of traditional systems, as nuclear families develop individualistic tendencies in response to difficult economic situations and perceived opportunities."* One prime example for these individualistic tendencies is the increased normalization of cash payments for communal labor and land preparation that results in higher expenses for many farming households, and especially for those who are not able to perform strenuous agricultural work by themselves.

These broader social trends are also reflected in the results of the household survey. When asked for reliable networks that the household could turn to in times of need or crisis – for example when the household is affected by those risks that members of the household identified to be most relevant for their own livelihoods – a majority of participants mentioned the 'nuclear family' (rural 80.6%, urban 84.5%, irrigators 90%), followed by the 'extended family' (rural 44.4%, urban 38.5%, irrigators 35%) and 'close friends' (rural 25.3%, urban 39.5%, irrigators 25%). By comparison, people in the 'same community' featured far less prominently in the perception of household heads (rural

⁴⁴ Such a distinct pattern of socio-spatial differentiation must not always be assumed, since there are also cases where wealthier individuals move to the peri-urban fringes of bigger cities, for example in Accra.

5.3%, urban 3%, irrigators 5%). These results point toward a tendency of individualization that manifests itself most clearly in urban areas.

For example, while household heads in rural areas still recognized the support of 'traditional authorities' (9.1%), 'community based organizations' (CBOs) (3.9%), 'local politicians' (8.4%), 'international non-governmental organizations' (INGOs) (1%) and the 'United Nations system' (3.5%), these organizational support mechanisms played no role at all for urban households and households with direct access to the Veia irrigation scheme. The only organizational support mechanisms that were more widely acknowledged by all three types of households were the support networks of 'faith based organizations' such as local mosques or churches (rural 7%, urban 3%, irrigators 5%), and the support of 'NADMO' (rural 6.3%, urban 27%, irrigators 20%).

Generally, membership in social groups was comparatively low in the case of urban households, which also confirms the presumed trend toward greater individualization in urban environments (rural 60.2%, urban 27.5%, irrigators 70%). Comparatively, rural households and households with access to the Veia irrigation project appear to be better networked, for example through communal labor as well as participation in farmer-based associations and farmers' unions. Such relations of reciprocity and social networks seem to be less strongly developed in urban areas.

In addition, it was found that access to agricultural extension services is distributed in a highly uneven manner among rural smallholder farmers and farmers with access to the Veia irrigation facilities (rural 15.5%, irrigators 45%). These results are consistent with earlier studies on farmers' adaptation strategies in rural northern Ghana, which report that "agricultural extension services are missing" for smallholder farmers in rural areas (Laube *et al.* 2012, p. 764). A similar pattern of uneven access also emerged with regard to tractors (rural 2.5%, irrigators 20%), improved seed varieties (rural 7.4%, irrigators 15%), and in-

organic fertilizers (rural 11.3%, irrigators 45%). Apart from wider financial issues, this pattern of uneven access to agricultural inputs and services can be explained by comparatively better conditions for commercial farmers who are able to purchase land at the Veia irrigation scheme, and consequently benefit from the on-site services of both ICOUR and MOFA.

With regard to the provision of inorganic fertilizers, in particular, it was revealed during informal group discussions in Veia that the two main reasons for uneven access are corruption and the limited flow of information to rural farmers. Since 2008, inorganic fertilizers are subsidized by the Government of Ghana, thus guaranteeing beneficiaries a 50 percent discount on fertilizer purchases. To benefit from these fertilizer subsidies, it is nevertheless necessary for farmers to acquire official coupons that are distributed by MOFA through its AEAs. However, the majority of the poor hardly benefit from existing government subsidies, mostly due to a general lack of awareness and formal education, and because of illegal practices such as fertilizer theft and bribery with regard to the distribution of fertilizer coupons. These findings point toward another instance where the interplay between the 'politics of indeterminacy' and local 'triangles of accommodation' has ultimately turned the tables in favor of wealthier and better networked local elites.

Urban households, by contrast, considered agricultural service delivery to be factually nonexistent. Once again, this result may support the initial hypothesis that agriculture and livestock keeping play a comparatively minor role as primary livelihood activities for urban populations in the research area. Another way of looking at this service gap, however, is that a dormant potential for intensifying urban agriculture through improved and more targeted service delivery exists. In fact, the potential of urban agriculture might be tapped to diversify income sources and to increase the adaptiveness as well as the food security of

urban populations – especially of the urban poor – with probable positive rippling effects for their education and health (see Kuusaana and Eledi 2015).

Concerning financial capital in general, access to formal credit schemes was slightly better for urban households than for those in rural areas, while commercially oriented farm households with access to the Vea irrigation scheme found it much easier to obtain a credit if needed (rural 16.9%, urban 18.5%, irrigators 55%). These findings are not surprising, given the inability of poor households to provide adequate collaterals to local banks or farmer-based groups, and due to the risky or precarious nature of most occupations in the area. At the same time, informal credits are often arranged between local elites and the rural or urban poor, who hardly have other opportunities to access financial capital. In many cases, these informal arrangements are of a rather exploitative nature, and do not contribute to sustained pro-poor development (see Schindler 2010).

The key question that still needs to be answered, then, is what lessons may be learned from these combined findings, particularly with regard to the circumstances in which households might or might not be able to rely on social institutions and organizational support mechanisms to increase their adaptiveness.

On the one hand, it can be concluded that there is a rather close match between the risk priorities of household heads and district level DRR specialists in the case of storms, floods and drought, particularly because such risks are directly related to the political mandate of NADMO. In the agricultural sector, on the other hand, it has been observed that AEAs are well aware of the income diversification strategies and adaptation techniques that are applied by farm households to manage their scarce physical resources (e.g. land, soil and water) and deal with the uncertainties of risky agricultural livelihoods (see Figures 8 and 9).

Beyond reactive DRR measures and the immediate adjustment of agricultural practices to climatic stressors, however, noticeable implementation gaps exist at different levels of government. For example, more coordinated CCA and DRR approaches are still missing when it comes to addressing the negative impacts of macro-level social dynamics such as persistent decentralization challenges, the absence of non-farm economic opportunities, and the erosion of social support networks beyond the core family. This situation, together with poverty related concerns and a lack of policy coordination among donors and government agencies across sectors contributes to patchy policy implementation as well as unreliable organizational support mechanisms for local populations.

Indeed, some of these organizational challenges were taken into account in the NCCP as well as in the *Ghana Goes for Green Growth* document, especially in the context of "fragmented environmental legislation and poor governance due to poor coordination of management" (NCCP 2013, p. 70), and with regard to the prioritization of "equitable development, coordination and harmonisation" (*Ghana Goes for Green Growth* 2010, p. 9). There is also general awareness among policy makers that the development of integrated implementation and long-term investment strategies with a focus on bulk infrastructure and public service delivery is still lagging behind.

Nevertheless, it is questionable whether such political measures alone will be sufficient to move multi-layered organizational settings toward more integrated, equitable and forward-looking adaptation pathways. With regard to household adaptiveness and situated risks, the results of the survey rather indicate that – at least in the case of Veia irrigation project – farmers' food and livelihood security did not increase significantly through comparatively better access to irrigation facilities, agricultural services, and financial credit schemes. Irrigators in the research area, in other words, were not found to be considerably more food secure than rural or urban households.

As discussed in the previous section, the root causes for this situation are high population growth together with a strong economic dependence on precarious agricultural livelihoods. In particular, a pervasive lack of alternative income sources ties many households to a gradually deteriorating natural resource base, and forces farmers to engage in unsustainable agricultural practices. With the exception of the wealthiest farmers who are able to shift their production if soils get depleted, most farmers at the Veia irrigation scheme are compelled to farm the same land one year after another, without fallow, due to unequal access to scarce land resources.

In addition, Fianko *et al.* (2011, p. 222-223) point out that the UER accounts for one of the highest rates of fertilizer consumption in the whole of Ghana, mostly as a result of commercial farming activities at the Veia and Tono irrigation schemes. However, intensive fertilizer and chemical application lead to the acidification of soils, while mechanical land preparation, deforestation, overgrazing and the burning of crop residues further exacerbate soil degradation and erosion in areas under intensive year-round use (MOFA 2007, p. 7; also see Obiri-Nyarko 2012). One of the results of these unsustainable resource management practices is that cropping outputs at the Veia irrigation scheme were consistently lower than the desired cropping targets, with consequent negative impacts on household income and food security (see Annex 3).

In other words, better access to tractors and agro-chemicals does not necessarily lead to more sustainable farming outcomes, since existing agricultural intensification strategies are often rather ill-suited for local soil conditions. The improper use of chemicals, for example, favors the spread of pests and diseases by depleting soil fertility, and by increasing insecticide resistance in insect populations. In a similar way, intensive monocropping for commercial purposes increases the probability of weed infestations. Overall, there is evidence to suggest that unsustainable forms of land intensification significantly contribute to envi-

ronmental degradation in high-density farming areas, and that the unprofessional application of chemicals at the Veia irrigation scheme leads to considerable health risks for both farmers and consumers (see Pelig-Ba 2011, Jayne *et al.* 2014).

Another factor that plays an important role with regard to low cropping outputs and the food insecurity of irrigating households at the Veia irrigation scheme is the poor condition of the existing infrastructure. Despite the fact that irrigators have direct access to the Veia project facilities, the performance of the irrigation infrastructure is severely hampered by low water levels in the reservoir as well as the poor state of irrigation canals and drainage systems. Thus, even if sufficient water for irrigation is available, the opening of irrigation gates frequently leads to the indiscriminate flooding of fields, thereby resulting in crop damage as well as the washing away of applied fertilizers.

These findings clearly illustrate that improved access to agricultural inputs and irrigation facilities alone is not sufficient to prevent seasonal food shortages. Kuwornu and Owusu (2012, p. 86) largely support these empirical findings by asserting that *"traces of food unavailability in some periods of the year within irrigating households cast doubts about the potency or efficiency in provision of support services in the irrigation areas."* Another study by Al-Hassan (2015, p. 78), which explores the food security situation of irrigators and non-irrigators in the Bolgatanga Municipal District, finds that *"two-thirds (66%) of irrigators (...) compared to 73% of rain-fed farmers reported having experienced food shortages."*

Similarly, access to credit and improved seed varieties does not necessarily translate into sustained household food security. Although irrigators have better access to formal as well as semi-formal credit schemes and improved seed varieties than rural households, interviews in Veia revealed that such services may not always generate the

expected benefits.⁴⁵ Credit utilization may be ineffective due to factors such as poor infrastructure and the resulting waste of fertilizers, because of the risky nature of farming in general, and in view of a general lack of hired labor for land preparation if household labor is not a feasible option.

A recent study by Nyantakyi-Frimpong and Bezner Kerr (2015) also finds that the adoption of improved or "hybrid" maize varieties is not always the best choice for smallholder farmers. Despite the promise of higher yields, hybrid maize varieties have higher labor as well as fertilizer and agro-chemical requirements, while new seeds need to be bought every season, which makes the production of hybrids more expensive. At the same time, hybrids are less resistant to late season droughts than local varieties, and not well-suited for beneficial intercropping with legumes or other cereals, as the study reveals.

Furthermore, if households are additionally affected by hazards such as floods or storms during the cropping year, it is evident that organizations such as NADMO can only provide emergency relief services (if at all). Yet they are not able to assist individuals in coping with the medium- and long-term impacts of property loss and damage. As crops and household items are generally not insured, farm households can easily fall back into poverty due to recurring hazards such as drought, flooding or storms, while agricultural credit may be diverted to non-agricultural uses.

Placing the focus of 'pro-poor' agricultural adaptation strategies primarily on access constraints and high-input intensification without simultaneously considering the quality of services, infrastructural provision, and infrastructural maintenance is therefore likely to result in unbalanced adaptation outcomes. Hence it is questionable whether the

⁴⁵ In the rural financial sector, "formal" credit is mainly provided by rural and community banks as well as savings and loans companies, while "semi-formal" credit schemes are primarily offered by NGOs and cooperatives such as credit unions (Bendig *et al.* 2009, p. 11).

agricultural modernization approaches that are outlined in the NCCP (2013, p. 30), namely "*the development and application of new crop varieties ...; higher energy and water inputs to support large-scale irrigation; and mechanization*" are all equally suitable to increase food security as well as long-term yield stability in the research area.

Lastly, it needs to be ascertained why urban households in Bolgatanga seem to be relatively better off in terms of food security, despite existing evidence for greater individualization and lower levels of institutional support. Is there reason to believe that income diversification away from agriculture – which normally accompanies processes of urbanization and labor market transformation – actually better the food security situation of urban households?

Generally, there are only few recent studies that deal with the development of the urban political economy in northern Ghana (see, for example, Naab *et al.* 2013, Poku-Boansi and Amoako 2015, World Bank 2015a). These studies paint a rather mixed picture with regard to the effects of urbanization on poverty reduction, income diversification and food security in Ghana's northernmost regions. Obeng-Odoom (2012, p. 85), for example, aptly summarizes the mixed effects of accelerating urbanization by pointing out that "the increasing prominence of the private sector in the urban economy has impacted positively on capital formation and job creation [while] urban and national inequality levels have dramatically increased."

In answer to these concerns, the Ghanaian Government has identified a considerable number of pressing urbanization challenges that will have to be tackled to reduce urban poverty and to achieve more inclusive economic development. These challenges include the underdevelopment of the urban economy and the industrial sector, prevalent land use disorder and unplanned urban expansion, poor urban governance and institutional coordination, as well as inadequate infrastructure and public service delivery (World Bank 2015a, p. 9).

Youth unemployment and under-employment also continue to be serious problems for social cohesion in the country, although reliable statistics are not available at the moment, and published estimates vary considerably. A recent report prepared by the Ghanaian Workforce Development Institute estimates the youth unemployment rate to be 15.9 percent (Baffour-Awuah 2013, p. 2), while the African Economic Outlook (2012, p. 14) states an unemployment rate of 25.6 percent for the age group between 15 and 24. By contrast, the sixth round of the Ghana Living Standards Survey reports that only 5.5 percent of the Ghanaian youth are currently unemployed (GLSS 6 2014b, p. 68).

Regardless of these differences in numbers, however, there is little doubt that unemployment, especially among young people in urban areas, is one of the biggest problems facing the Ghanaian economy. In its National Employment Policy, the GoG (2014, p. 2) has emphasized that it is "now set to deal comprehensively with the challenge of growing unemployment (...) targeting in particular, vulnerable groups, the youth, women and persons with disability." In the Bolgatanga Municipality, this pledge has unfortunately not been backed by sustained political action. It has been reported, for example, that the National Youth Employment Programme – an initiative created by the government to address the problem of youth unemployment – was completely inactive during the years 2013 and 2014 (Bolgatanga Municipal Assembly 2015, p. 22).

In addition to these labor market constraints, it is evident that the development gap between the southern and northern regions of Ghana makes diversification into non-farm economic activities particularly difficult for people who are living in the urban centers of the northern savanna. In the Bolgatanga Municipality, existing opportunities for non-farm income generation are mostly self-employment, low paying jobs in the private informal sector, and – to a very limited extent – private as well as public wage jobs (GSS 2014, p. 42). The fact that 41 percent of all urban households that were interviewed for this study did

not have access to formal education also shows that there is an urgent need for improved education and skills training.

However, even though opportunities for urban households to engage in non-farm economic activities are limited, especially for low-skilled workers and vulnerable groups, the results of the survey also show that urban households in Bolgatanga are relatively more food secure than rural households and irrigators. These findings are still surprising, especially in view of existing individualization tendencies, and in the light of empirical evidence for lower levels of organizational support for urban households. Hence it must be assumed that the urban environment in Bolgatanga offers structural advantages which have a moderately positive effect on the food security of urban households.

Although there are only few studies which focus on food security in northern Ghana's cities, previous research indicates that some of the key factors which are most likely to have a positive impact on the food security of urban households are education, salable skills and household composition, whereas factors such as remittances and access to credit appear to be less relevant (Maxwell *et al.* 2000, p. 147; also see Frimpong and Asuming-Brempong 2013, p. 29). Therefore, despite the difficult economic situation in the UER, there is reason to assume that higher educational levels in urban areas also lead to a relatively higher likelihood of finding gainful employment, and ultimately effect higher per capita food expenditures which might outweigh the high costs of living in an urban environment (CFSVA 2012, p. 25-27).

Another point worth mentioning is the fact that urban agriculture as a small-scale strategy to increase urban food security has received considerable attention over the past decade.⁴⁶ Prior research in northern

⁴⁶ Referring to urban agriculture as a 'small-scale strategy' does by no means imply that urban agriculture is not important for achieving food security. It rather means that food production systems are also tightly linked to larger-scale phenomena such as market processes, macroeconomic policies, as well as larger infrastructural and governance systems with their respective discourses and dispositifs.

Ghana suggests that urban agriculture may act as an additional safety net for the most vulnerable segments of society, although certain reservations must be kept in mind. Studies on urban agriculture in northern Ghana show that urban farming is still below its potential, mostly because of environmental and health risks, due to limited institutional support, and as a result of conflicts over land use (Drechsel and Keraita 2014, Kuusaana and Eledi 2015).

Regarding the case of Bolgatanga, in particular, findings indicate that the role of urban agriculture in reducing food insecurity should not be overstated. Overall, 64 percent of all surveyed urban households in Bolgatanga had to cope with seasonal food shortages, while only 3.5 percent stated that agriculture was their main source of livelihood. In addition, agricultural risks played a much lesser role in the perception of urban households, which points toward a relatively minor role of agriculture as a key food security strategy for urban populations in the research area.

However, whether general conclusions about the role of urban agriculture as an effective adaptation strategy can be drawn from these findings is hard to evaluate. What can be said about food security in the research area as a whole, and about the results of the household survey in particular, is that a number of prior studies have reported similarly high rates of food insecurity (Quaye 2008, Al-Hassan 2015), whereas other assessments have given more conservative estimates, yet affirming that the UER is the region with the highest percentage of food insecure households in Ghana (see, for example, CFSVA 2012, p. 20).

Thus, as case study research does not easily lend itself to generalization and since available findings are often contradictory, it is evident that further research on the relational determinants of food (in)security in northern Ghana's rapidly growing small- and medium-sized cities is urgently needed.

As Frimpong and Asuming-Brempong (2013, p. 30) remark, there are still "serious gaps in our knowledge and understanding of whether the

causes and determinants of food security in rural and urban households are the same to warrant the same approach in dealing with the problem." It is not entirely clear, for example, whether lower reliance on agriculture and better access to infrastructure in urban environments significantly increase the adaptiveness of households, considering that the costs of living in a city are high, and that constrained urban job markets provide very limited opportunities for non-farm income diversification. Especially for the most vulnerable segments of the urban population, and for individuals with low educational levels, it is extremely difficult to diversify into sustainable non-farm employment.

Regarding the rural end of the rural-urban continuum, the survey results also show that access to credit, services, inputs and infrastructure alone will not lead to a substantial improvement in household adaptiveness as long as issues of *quality* and *utilization* receive comparatively little attention. Moreover, there is ample evidence to suggest that large-scale, export-led commercial agriculture with high input demands, as it is currently envisioned in relevant agricultural policies for northern Ghana (SADA 2010, p. 25 and GSGDA II 2014, p. 54-58), is not a 'one size fits all solution' for food security and long-term yield stability in the region.

Instead of shifting the focus of agricultural policy away from small-scale farming and toward large-scale commercial agriculture, it seems prudent to strengthen smallholder agricultural systems and traditional crops that are historically well adapted to the northern savanna zone. Increased climate variability and the pervasive lack of economic alternatives for the rural poor at least suggest that the effectiveness of inclusive adaptation strategies along the rural-urban continuum hinges on the promotion of sustainable smallholder agriculture and non-farm employment options. Finding an appropriate balance between necessary agricultural modernization and increased support for sustainable agroecological food systems will then be a major challenge for Ghanaian decision makers.

From an institutional point of view, the analysis also revealed that contested cultural values, norms, discourses and power relations, which shape institutional life in all its diversity, have received far less attention in contemporary adaptation research and practice. These blind spots have tangible consequences for the implementation of socially inclusive adaptation actions, since many project-based interventions tend to downplay or simply ignore the inherently politicized nature of complex adaptive processes.

In sum, the results of the survey have thoroughly confirmed that social vulnerability and low adaptiveness are not merely resulting from climate change and increased variability. Income and power disparities as well as existing skills gaps and gender imbalances also have a strongly negative effect on peoples' adaptiveness. At the same time, more integrative and multi-sectoral CCA and DRR approaches are still missing when it comes to addressing the negative impacts of macro-level social dynamics. Negative macro-level impacts include persistent decentralization and infrastructural challenges; poverty related concerns; corruption and rent-seeking; the absence of non-farm economic opportunities; and the erosion of social support networks. Together with low organizational capacities and a lack of policy coordination among donors and government agencies, this situation contributes to patchy policy implementation and results in unreliable support mechanisms, particularly for vulnerable citizens who depend on a gradually deteriorating resource base.

In order to put these empirical findings into a concrete decision-making context, however, I will now link the results of the study to an institutional pathways perspective. In doing so, I aim to present forward-looking and actionable adaptation alternatives, while simultaneously taking the discussion beyond a strictly managerial focus.

CHAPTER FIVE: FROM ADJUSTMENT TO TRANSFORMATION?

The concluding chapter briefly summarizes possible institutional adaptation pathways based on a set of four empirically grounded and structurally different adaptation scenarios. These scenarios are meant to serve as heuristic devices to support decision making. They are defined as institutional adjustment, reform, and transformation. It is neither assumed that any particular institutional pathway presents an optimal adaptation solution nor that there is always a choice between alternative options. Therefore, the chapter also discusses institutional factors embedded in each of the three adaptation pathways vis-à-vis the regressive tendencies of business-as-usual. While investigating possible scenarios, particular emphasis is placed on the political nature of adaptation. It is argued that adaptation planning is not a straightforward and normatively neutral approach to addressing risk and vulnerability, since planning practices themselves are embedded in wider political and institutional contexts. In other words, it must be considered that planning and other power-ridden processes of rational organizing are influencing risk and vulnerability. Hence it is the goal of this chapter to summarize the empirical findings of the study to demonstrate under which circumstances one may speak of tangible institutional influences on the social production of vulnerability, and under which circumstances one may have to reject the hypothesis that institutions are the primary factor that determines social vulnerability in the research area.

Emerging Institutional Adaptation Pathways

Institutions exert a great influence on the ways in which risks are mediated and produced in the social sphere. Responding to risks such as

rapid urbanization, rising social inequalities and climate change thus requires societies to address the institutional root causes of multidimensional vulnerabilities. Yet, addressing the root causes which make people, ecosystems and the built environment vulnerable also means to recognize that adaptive processes are intrinsically political. It is evident that occurring harm is not only determined by biogeochemical and technological hazards, for instance climate variability and infrastructure failures, but also by the degree of vulnerability and exposure to multiple social risks (IPCC 2012, p. 69). Institutionally entrenched power asymmetries as well as competing goals, values and knowledges must all be taken into account while exploring how adaptation is defined and implemented by various interest groups.

Contending with the 'messy' day-to-day reality of organizing and decision making therefore means to realize that individual or collective action in favor of institutional change is frequently ignored or even actively resisted. Accounts of institutional change that emphasize the creativity and agency of progressive forces run the risk of underestimating the often quite remarkable resilience of reactionary elements. In other words, exploring how resistance to change shapes institutional processes over time also means to identify those actors "who benefit from a particular institution, and who support continuation or will fight a change that will disadvantage them" (Sorensen 2015, p. 22). Especially if immediate 'win-win' solutions are unlikely to materialize, resistance to change is to be expected. This problem may be defined as the "politics of unsustainability" or the contradictory practice of attempting to sustain unsustainable development pathways, while simultaneously espousing a rhetoric of ecological modernization, resilience, and progress (Blühdorn 2011, p. 34). Hence it is reasonable to assume that deeply engrained cultural-cognitive patterns, behavioral routines and short-term orientations make it inherently difficult to purposefully transform unsustainable socio-material structures dominated by powerful vested interests into more equitable, sustainable and adaptive forms of social organization.

In view of these analytical and political predicaments, so-called "adaptation pathways" have gained increased prominence as approaches that support the inclusive development and coordination of adaptation responses across multiple scales and under conditions of deep uncertainty. Sharpe *et al.* (2016, p. 3) describe adaptation pathways as perspectives that "*aim to help work toward new futures in a semiexploratory way (e.g., by identifying different routes and paths) but without the specificity of a single roadmap that assumes the ability to control all the sources of complexity.*"

Multiple pathways approaches have been proposed in the adaptation literature. Some of these approaches are highly technical, and focus on large-scale, integrated models and other types of computational scenarios to project the key characteristics of adaptation pathways. This includes future emission scenarios, cost-benefit analyses, and the monitoring of social-ecological tipping points (Haasnoot *et al.* 2013, Clarke *et al.* 2014).

Other pathway principles, in turn, are more concerned with integrating diverse knowledges and questions related to power or social justice when informing decision making (Leach *et al.* 2010, Butler *et al.* 2016, Eisenhauer 2016). This specific understanding of adaptation pathways is less focused on technical modeling, and can be seen as more accommodating to interpretive perspectives from the social sciences and humanities. As the opening case study has shown, it is indeed of paramount importance to better integrate social scientific research and the views of marginalized groups into adaptation planning to prevent social conflicts and maladaptive outcomes. Yet, identifying the key decision points and critical junctures of adaptation pathways in advance to work toward equitable outcomes is a daunting task, particularly in view of the complex political realities and informational constraints of everyday decision making. It is therefore questionable whether the simplistic "stop-go" logic of social change that arguably informs notions of 'key decision points' and 'critical junctures' has the potential to

account for more slow moving and incremental dynamics of institutional change (Lowndes and Roberts 2013, p. 202). Change within institutional adaptation pathways, in other words, is not necessarily characterized by long periods of strict path dependency that are punctuated by critical junctures or external shocks (i.e. the 'stop-go model' of change). Instead, institutional pathways are in a state of permanent dynamism due to constant antagonistic struggles over meanings and resources, while the impacts of hazards such as climate change can be interpreted as the outcome of long-term human interactions with the Earth system. Instances where abrupt social-ecological change becomes visible as a critical juncture, as a regime shift, or as an impactful event are thus often the result of the gradual interaction between cultural-cognitive and biogeochemical change processes over time. This is precisely the point where a combination of institutional analysis, discourse analysis and pathways approaches can provide valuable insights into the structural aspects of socio-material change over time.

To operationalize process-oriented pathways approaches under conditions of complexity and uncertainty, scenarios remain one of the most widely applied methods today. Scenarios "are usually developed as a small set (two to four) of plausible and structurally different futures" and serve as inputs to strategic pathway processes by keeping existing uncertainties visible in ways that challenge the basic assumptions on which current activities are based (Sharpe *et al.* 2016, p. 3). In Ghana, the so-called 'Akropong Approach' has been developed as a tool for adaptation planning and cross-sector impact analysis. The Akropong Approach uses qualitative and quantitative scenario components to explore interactions between drivers or trends that have been identified as central to the adaptive challenge by the individuals involved in the planning process (Kemp-Benedict and Agyemang-Bonsu 2008, p. 834).

Nevertheless, due to the inherently politicized nature of adaptation planning, it needs to be borne in mind that scenario planning tools such as the Akropong Approach also have their specific weaknesses.

First, it may be contended that questions related to power, social inclusion and underlying political values receive relatively little attention, since the planning focus is more on cross-sectoral policy coordination, and less on the wider sociocultural, institutional, economic and discursive context in which adaptation pathways are embedded. Second, there is a clear tendency to limit the range of stakeholders to government and donor agencies, NGOs, and select specialists, whereas marginalized groups such as smallholder farmers and the urban poor are seldom permanently involved in planning procedures. This means that scenarios might be biased in favor of more powerful groups who are actively engaged in their development, while the interests and perspectives of less well networked groups are not sufficiently accounted for.

Lastly, although it is difficult to deduce trends in risks from locally specific risk perceptions, the excessive use of quantitative models and statistics to inform future policy scenarios is not always advantageous. Primarily relying on calculative models to inform qualitative 'futuring' strategies might even provoke different forms of cognitive bias. This includes the tendency to interpret scenario-related information in a way that confirms one's preconceptions, as well as the tendency to regard future options that are based on numeric information or quantifiable probabilities as more objective, because the normative assumptions behind calculative approaches are often less visible.

The notion of *institutional adaptation pathways*, as I have described it, thus offers an additional perspective on scenario planning by focusing on empirically traceable discursive and institutional determinants of social change. Therefore, it can serve as a useful extension of existing scenario planning approaches. Augmenting the cross-sectoral strategic perspective of the Akropong Approach, the notion of institutional adaptation pathways combines qualitative methods such as institutional and discourse analysis with quantitative risk assessment components. The main aim is to determine how dynamic institutional settings might

potentially influence the ways in which adaptation pathways are spatially and temporally evolving.

At the same time, however, institutional pathways seek to explore how institutions and organizations themselves adapt to rapidly changing socio-environmental conditions. Based on information gathered from empirical research, different institutional adaptation pathways are represented by a set of possible scenarios. These scenarios are institutional adjustment, reform, and transformation. It is neither assumed that any particular institutional pathway scenario presents an optimal adaptation solution nor that there is always a choice between alternative options. Therefore, attention is also given institutional factors that may move adaptation pathways toward business-as-usual scenarios. The main aim is to show under which circumstances one might speak of tangible institutional influences on the social production of vulnerability and risk, and under which circumstances one may have to reject the hypothesis that 'institutions are the primary factor that determines social vulnerability.'

'Adjustment'

The adjustment pathway scenario is based on the core assumption that the paradigms of technological adjustment and resilience will continue to dominate adaptation policy making in the short and medium term. Especially the 'climate-proofing' of economic development is currently promoted as a key policy response by a variety of influential political actors in Ghana. In the context of proposed adjustment strategies, strong emphasis is placed on infrastructural improvement as well as on the agricultural, energy, and natural resource sectors. Infrastructural adjustment projects are not only popular among the general population, they are also politically lucrative and prestigious. In his foreword to the National Climate Change Policy, the President of the Republic of Ghana, H.E. John Dramani Mahama, writes:

"What is relevant for Ghana is to ensure the mainstreaming of the *climate-proofing agenda* into national development (...) It is my cherished hope that the National Climate Change Policy will serve as springboard for initiating a *climate-resilient economy* that will accelerate our development efforts and enhance the well-being of our people without sacrificing the quality of the environment and its resources" (NCCP 2013, p. v-vi; emphasis added).

Overall, a detailed analysis of organizational discourses at the national, regional and district levels revealed that the understanding of adaptation as adjustment to climatic stressors presently dominates organizational perceptions at multiple scales. Donor-driven efforts at 'mainstreaming' CCA into DRR planning at the district level, for example, primarily resulted in interpretations of adaptation as adjustment to environmental stressors. This normative bias will clearly affect adaptation policy and practice, as long as international donor agencies focus their adaptation efforts on "what might be termed the more 'manageable' manifestations of climate change, namely, changes in seasonal and inter-annual variability (for example, in rainfall), and in the frequency and severity of extremes such as droughts, storms and floods (Brooks *et al.* 2009, p. 752).

In view of these converging trends, adjustment is a highly probable adaptation scenario that is likely to generate additional organizational feedbacks and shape future institutional pathways through the distribution of resources and risks. Overall, proposed adjustment policies favor the maintenance of systemic equilibrium by adjusting to actual or expected climate change and its effects. In terms of concrete policy interventions, adjustment mainly focuses on infrastructure improvement and technical responses to narrowly defined 'natural' risks, while promoting 'no regrets' adaptation strategies such as the development of more effective early warning or emergency response systems. Other proposed measures include the improvement of irrigation, transport and storage infrastructure, as well as the promotion of agricultural technologies and inputs such as new seed varieties. Consequently, the

primary focus of adjustment adaptation is not so much on the social root causes of multidimensional risks and vulnerabilities, but rather on the safeguarding of economic growth and development pathways under conditions of climate change and increased variability.

However, while ecological and population pressures on scarce resources such as land, soil and water are constantly growing, a mere focus on adjustment adaptation might not be suitable to address the more structural constraints of adaptation. A lack of social inclusion and economic opportunities, together with persistent quandaries of low organizational capacity and unfinished decentralization are still hampering collective efforts to increase social adaptiveness. Technological and infrastructural adjustment, in other words, are unlikely to be successful as a primary adaptation strategies, as long as the organizational and political conditions for their integrated implementation are not met.

In the case study on the rehabilitation of the Veia irrigation dam, for example, it has become clear that inclusive planning and a thorough knowledge of complex institutional, cultural and political settings is an absolute necessity to avoid prolonged conflicts that might stall the implementation of infrastructural adjustment projects. This applies even in situations where positive sentiments toward specific adjustment interventions prevail among the population, and 'bottom-up' and 'top-down' policy approaches are pursued in tandem.

Moreover, it has become evident that mere *access* to irrigation facilities or credit schemes did not significantly improve the food and livelihood security of rural farming households in the research area. A focus on access alone is hardly sufficient, as long as issues of *quality* and *utilization* receive comparatively little political attention. For example, even if financial credit and agricultural inputs such as inorganic fertilizer can be accessed, their utilization is frequently ineffective. This is partly the result of factors such as labor shortages for land preparation and poor infrastructure, but also because of the risky nature of farming in

general. If households are affected by additional hazards such as drought, floods or storms during the cropping year, it is clear that organizations such as NADMO are not able to assist individuals in coping with the medium- and long-term impacts of property loss and damage. Since crops and household items are normally not insured, farm households can easily fall back into poverty due to recurring hazards, while agricultural credit may be diverted to non-agricultural uses. Previous research in northern Ghana has also proven that the adoption of improved seed varieties is not always the optimal solution for farmers (see Nyantakyi-Frimpong and Bezner Kerr 2015). Despite the promise of higher yields, hybrid maize varieties have higher labor as well as fertilizer and agro-chemical requirements, while new seeds must be bought every season. This makes the production of hybrids more expensive and creates economic dependencies on agrochemical producers and their pricing policies. At the same time, hybrids are less resistant to late season droughts than local seed varieties, and also less well-suited for beneficial intercropping with legumes or other cereals.

Therefore, it can be concluded from the empirical findings of the study that technical adjustment approaches alone will not be sufficient to reduce complex vulnerabilities and move multi-layered institutional settings toward more integrated, equitable and forward-looking adaptation pathways. Consequently, the second pathway scenario will focus on the idea of institutional reform and discuss under which circumstances a reformist pathway may be required to complement or enable proposed adjustment measures.

'Reform'

The reformist pathway scenario is based on the political goal of improving particular attributes of a given reference system without altering its fundamental properties. When applied in the context of adapta-

tion, a reformist institutional pathway entails incremental organizational responses to the negative effects of actual or expected climate change and variability. In other words, a reformist adaptation pathway neither advocates for the social status quo nor endorses fundamental systemic or paradigmatic change. It rather concentrates on managerial reforms within socio-ecological systems through the iterative modification of laws, technologies, rules, and decision-making processes. Put differently, reformist adaptation may question organizational rules and decision-making processes, but not the underlying socioeconomic paradigms and asymmetric power relations that govern these very rules. The dominant normative and behavioral paradigms under which the reformist approach operates – according to the critical CCA literature – are ecological modernization and sustainable development interventions.

However, depending on its concrete political interpretation, a reformist institutional pathway may still enable transformative outcomes because of its emphasis on incremental institutional and structural change in existing governance regimes. Simultaneously, the reformist approach reaches beyond the primarily technical and infrastructural perspective of adjustment pathways, due to its focus on changing multi-layered institutional settings, and its orientation toward developing flexible and responsive organizational structures.

In the context of Ghanaian climate politics, reformist institutional pathways are linked to the influential policy narrative that institutional reforms are urgently needed to build a strong organizational basis for policy implementation. Institutional and governance reforms, in other words, are seen as a necessary conditions to mitigate the risks that climate change and increased variability pose for socioeconomic development (see, for example, Hyogo Framework for Action 2005, NCCP 2013, NADMO 2015). In short, institutions should be strengthened to become more transparent and adaptive to change, which can present new development opportunities.

However, discussions about institutional reform are not a novel phenomenon that is merely related to adaptation. Reformist ideas are, in fact, tightly linked to older decentralization debates that have shaped Ghanaian political discourse since the late 1980s. Accordingly, decentralization challenges were frequently mentioned as a key problem during expert interviews, and are widely acknowledged to be one of the most important reasons why the implementation of adaptation policies is exceedingly difficult. In fact, decentralization challenges are featured prominently in scientific articles and donor brochures about every imaginable development issue that is currently under discussion in Ghana, ranging from local economic development and natural resource management to DRR, gender mainstreaming and CCA. Curiously, however, the analysis often stops at this point and technical or managerial recommendations are made, assuming the existence of a neutral administrative apparatus, while trying to explain how 'actors' form their causal beliefs about political interventions according to 'rational' criteria.

This reformist management logic does not present a problem *per se*, due to the fact that people who are working in governmental environments are certainly engaged in multiple practices of rational organizing. However, even if it is assumed that a reformist pathway is the *sine qua non* to advance adaptation, it has to be asked how managerial rationalities are perceived – and often transcended or transformed – by those who are supposed to enact them.

At the regional and district level, government officials and assembly members have developed a rather critical view of new mainstreaming and policy pilot initiatives, mainly as a result of increased workloads for pilot districts and due to mainstreaming approaches that neglect long-term training measures. Capacity building and training workshops at the regional, district and sub-district levels are often irregular events, mainly as a result of relatively short project and funding cycles, while organizational capacities for the implementation and integrated coordination of CCA and DRR activities are still weak.

When asked to name the most relevant political bodies that could facilitate the decentralized coordination of adaptation and DRR activities across sectors, policy experts frequently mentioned the *Regional Disaster Management Platforms*. However, it is evident that the focus of regional DRM platforms is mainly on disaster prevention and relief efforts, and not necessarily on the planning and local implementation of adaptation programs or sustainable development projects. It was also mentioned during interviews that there was little exchange on climate change matters among the regional heads of government ministries, departments and agencies in the context of DRR platform meetings. Government specialists pointed out that the activities of DRM platforms are mostly focused on advocacy, awareness creation, and coordination.

Participants also considered *Environmental Management Committees* at the regional and district levels to be particularly relevant for the coordination and implementation of adaptation activities. Arguably, however, these coordinating platforms are still embedded in the same elite policy networks and top-down governance structures that characterize the entire political management system in Ghana. Particularly in the Upper East Region, Environmental Management Committees are nonetheless perceived to be suitable institutional entry points for the implementation of integrated adaptation actions, mostly due to the fact that there is already practical experience with desertification control, environmental awareness creation, and community involvement. Strengthening the role of these environmental committees, financial and otherwise, and linking them more closely to the work of the DRR platforms and the Ghana Meteorological Service was thus considered a preferred policy choice compared to establishing new adaptation-related implementation arrangements.

Nevertheless, strengthening existing DRR platforms and Environmental Management Committees could be considered an ambitious or even unrealistic political goal, as it implies to tackle the underlying structural problems of unfinished decentralization and conflicting and/or

overlapping political mandates. At the same time, it may be contended that the permanent introduction of new coordinating mechanisms for environmental management has thus far yielded little evidence of meaningful community involvement and tangible improvement on the ground.

A prominent reformist proposal for improving the direct political involvement of individuals that has been made in this context is to adopt a participatory approach under which communities drive the conceptualization and application of integrated CCA or DRR measures, for example with regard to the improvement of early warning systems. What is inherently problematic about such a reformist approach is that it normally avoids a deeper engagement with power-ridden institutional processes that affect the outcomes of deliberative decision making. Communities are, in other words, neither entirely communal – for example with regard to existing gender disparities and social inequalities – nor fortuitously 'at risk'.

Placing bottom-up communication and implementation at the heart of integrated DRR and CCA approaches thus requires great caution, since potentially conflicting political expectations, ambiguous social norms and previous experiences with development projects structure local power sharing arrangements. Flows of knowledge and resources between agencies and administrative levels in Ghana are highly politicized, while clientelist networks or political affiliations may undermine the impartiality of political interventions. At the same time, it is evident that structural and financial constraints are fundamentally limiting the operational readiness of local governance structures, especially at the level of the Town/Area Councils and Unit Committees.

The basic suggestion by Sova *et al.* (2016, p. 1) that "increased participation from political agents, as well as from traditional authorities and farmers (...) can help reverse the a-political nature of the adaptation regime, improve power pluralism across actor groups and levels, and

facilitate cross-level cooperation between formal and informal institutions" therefore runs the risk of gravely underestimating the inherent complexities of an already highly politicized and multi-layered institutional environment. The caveat by Sova *et al.* (2016, p. 12) that locally specific research findings are not necessarily reflective of all districts or regions, and that "traditional ruling structures for example, differ dramatically across the country" certainly apply in the context of the area that has been the focus of this investigation.

Traditional leaders, for example, enter in locally diverse and highly complex relationships with the bureaucratic state, whereas state authorities and politicians often seek to align themselves with coalitions of customary authorities to advance their strategic priorities. Evidently, these political configurations are not always free of conflict. The opening case study has clearly shown, for example, how conflicts might arise between state authorities and traditional leaders, as well as between customary authorities themselves, while communities may be internally divided. Statements implying that conflict resolution capacities in the region are fairly high based on community solidarity and the influence of traditional leaders such as chiefs and earth priests who can enter in rational negotiations with the state thus have to be considered superficial at best, and outright risky at worst, depending on the concrete policy and planning context. In essence, such reformist proposals assume that adaptation processes are governed by clearly identifiable, benevolent and essentially neutral institutions that interact based on shared political values like swift conflict resolution in the public interest. That this is not necessarily the case, at least as far as the 'messy' everyday realities of policy implementation and decision making are concerned, is certainly a valuable lesson that can be drawn from this investigation.

However, reformist institutional pathways are not necessarily limited to improving public participation or integrating DRR and CCA measures. In addition to the reform of existing governance arrange-

ments, various reformist policies are also focusing on economic development and adaptation in the agricultural sector. High population growth together with a strong economic dependence on precarious agricultural livelihoods ties many rural households to a gradually deteriorating natural resource base, thus forcing farmers to engage in unsustainable agricultural practices such as cultivating already infertile and degraded soils one year after another, without fallow.

Yet, despite the ecological pressures that result from current smallholder farming practices, there is evidence to suggest that agroecological food production systems can indeed be environmentally sustainable, economically viable, and increase food security as well as yields, provided that the right incentives for farm-level adoption are put in place (see EOA 2015). Resorting to large-scale and export-oriented conventional agriculture with high input demands, as it is currently envisioned in relevant agricultural reform strategies for northern Ghana, is certainly not a 'silver bullet' for sustainable pro-poor development, food security and long-term yield stability, as previous research has shown (Nyantakyi-Frimpong and Bezner Kerr 2015).

Instead of completely shifting the focus of agricultural policy away from small-scale farming and toward large-scale commercial agriculture, it is rather recommended to simultaneously strengthen smallholder agricultural systems and traditional crops that are historically well adapted to the northern savanna zone. Supporting the implementation of the *Ecological Organic Agriculture Initiative* (EOA 2015) that is coordinated by the African Union Commission and aligned with the Malabo declaration as well as "Agenda 2063" (African Union 2014) can be an important step in this direction, even if it is to be expected that such an approach to agricultural development will not be sufficient in view of the complex structural challenges facing Ghana's northern regions.

Nevertheless, from a political point of view, it is equally unrealistic to expect single reform-oriented government initiatives such as the Savannah Accelerated Development Authority (SADA) to solve the structural and development related problems of northern Ghana. Al-Hassan (2013, p. 241) aptly remarks:

People expect SADA to transform agriculture, provide adequate infrastructure and ensure sustainable environmental practices. The majority perceive SADA as a saviour that will develop Northern Ghana. The divide between what people expect from the Authority and what it is mandated to do suggests that it will be difficult to meet those expectations, particularly due to political risks and funding limitations.

These political risks are closely related to the aforementioned institutional dynamics, which give rise to political power struggles over material and symbolic resources, and regularly lead to cooptation, delays, and socially unbalanced results. Yet, if modernization and expansion strategies for rural agriculture are not implemented in a socially equitable manner, it is to be expected that these interventions will create economic dependencies on large corporations and lead to the expropriation of smallholder farmers in areas with scarce land resources, thereby deepening already existing social problems and potentially creating new ones. The general lack of non-farm economic alternatives in northern Ghana, which is further aggravated by the realities of increased climate variability and uneven urbanization, at least suggests that the effectiveness of adaptation strategies hinges on finding the right balance between agricultural modernization, inclusive social development, and increased support for agroecological food systems.

With respect to the issues surrounding rapid urbanization and urban adaptation pathways in particular, it seems intuitive to assume that the institutional challenges of urban development in northern Ghana markedly differ from the problems confronting the agriculturally dependent population.

However, previous research on urbanization in Ghana rather suggests that insufficient financing, land market friction, poor infrastructure and unfinished decentralization are key challenges of urbanization, and that these challenges are structurally determined by "weak institutional capacity and coordination" (World Bank 2015a, p. x). Common institutional challenges of development across the rural-urban continuum therefore require greater scientific and political attention, especially in view of achieving long-term adaptation goals such as ensuring social inclusion under conditions of increased climate variability, expected climate change, and rapid urbanization.

What can be said so far with regard to the nature of urban livelihoods is that agriculture and livestock keeping play a comparatively minor role as *primary* economic activities for urban populations in the research area, with moderately positive effects for household food security. In sum, the study revealed that urban households are relatively more food secure than irrigating and non-irrigating farm households in rural areas, notwithstanding that households in rapidly urbanizing areas are less well networked, and receive less institutional support than their rural counterparts. Hence it must be assumed that the urban environment offers structural conditions which have a potentially positive effect on food security, even if opportunities for households to engage in non-farm economic activities are generally limited, especially for low-skilled workers and vulnerable groups.

Some of the key factors which are most likely to have a positive impact on the food security of urban households are education, salable skills and household composition, whereas previous studies suggest that factors such as remittances and access to credit are less relevant (Maxwell *et al.* 2000, p. 147; also see Frimpong and Asuming-Brempong 2013, p. 29). Overall, there is reason to assume that better education leads to a higher likelihood of finding gainful employment, thus ultimately effecting increased per capita food expenditures that outweigh the higher costs of living in an urban environment.

Conversely, it is clear that a regional political and trading hub like Bolgatanga attracts more educated individuals due to its moderately diversified economic structure and related job possibilities.

In any case, while more research on the precise determinants of urban household adaptiveness is undoubtedly needed, it can be concluded that the empirical findings of the study support at least two reformist pathway scenarios. The first scenario would assume that urbanization is beneficial for those who are already well-educated and both socially and spatially mobile, whereas low-skilled workers and the poor will suffer because of social inequalities that are both caused and aggravated by accelerated urbanization.

However, considering the overwhelming evidence in favor of the hypothesis that institutions are the primary factor which determines social vulnerability in the research area, these empirical findings also open up the possibility for a counterfactual pathway scenario, which assumes a more pronounced influence of environmental factors on social risk and vulnerability. The alternative reformist scenario is based on the key assumption that diversification away from agricultural livelihoods and a degrading natural resource base is an effective strategy to increase household adaptiveness and reduce social vulnerability. Put differently, urbanization trends such as a 21 percentage point decrease in the agricultural employment share from 1992-2010 may contribute to poverty reduction, human well-being and food security, provided that negative urbanization effects such as rising social inequalities and increased pressures on the environment as well as basic infrastructural services are kept in check (see World Bank 2015a, p. iii).

Yet, as long as it is not entirely clear in how far urbanization and a lower reliance on agricultural livelihoods may increase the adaptiveness of households, it is extremely difficult to make further predictions about the possible evolution of reformist institutional pathways. Consequently, it may be beneficial to pursue a twofold strategy. First, it is

absolutely crucial to strengthen organizational implementation capacities in the region for: (a) pro-poor service delivery and DRR (with a strong focus on post-disaster rehabilitation solutions and service utilization); (b) improved infrastructure provision (including long-term maintenance arrangements); (c) as well as long-term quality control and oversight to ensure the sustainability and effective coordination of flexible adaptation pathways. Simultaneously, however, it will be necessary to find a balanced strategy for agricultural reform that drives modernization and quality improvement in commercially oriented agricultural sectors, while acknowledging the ecological and social limitations of the conventional model of agriculture, especially for smallholder farmers.

Arguably, the adaptiveness and productivity of smallholder farming systems can not *only* be increased by agrochemical-based intensification, but also by supporting sustainable agroecological methods. Moreover, it is interesting to note that there is a dormant potential for intensifying urban agriculture through improved organizational support and more targeted agricultural service delivery. This dormant potential of urban agriculture can be tapped to further diversify income sources and increase the adaptiveness as well as the food security of urban populations – especially of the urban poor – with potentially positive rippling effects for education, health, and social security under conditions of rapid urbanization.

After exploring these various reformist perspectives, it must nevertheless be concluded that reformist institutional pathways are still primarily concerned with organizational and managerial processes. Institutional life is then perceived through the lens of bureaucratic tasks such as risk assessment, risk reduction, coordination, prioritization, and information management. While these organizational aspects are certainly important, it should be borne in mind that attempts at increasing public participation and incrementally reforming top-down governance structures have been beset by many problems in the past, including entrenched standard planning protocols, vested interests, and risk

aversion among decision makers. Moreover, the analysis of dominant adaptation discourses revealed that reformist approaches still exhibit the problematic tendency to naturalize socially produced risk. Naturalizing risk means to adopt a perspective on adaptation that (a) emphasizes adaptive responses to environmental phenomena and thus diverts attention from the *social* root causes of vulnerability and humanly induced climate change; (b) *individualizes* responsibility by explaining vulnerability as the result of low individual capacities, indeterminate systemic pressures, or irresistible fate; and (c) *depoliticizes* adaptation by assuming that complex nature-culture relations are governed by clearly identifiable, benevolent and neutral institutions.

Hence a transformative scenario perspective on institutional pathways is needed as well to avoid self-referential debates about organizational reform, which neglect the fact that adaptation planning is not a straightforward and normatively neutral approach to addressing risk and vulnerability. Evidently, planning practices are embedded in wider political contexts and guided by contested normative values and paradigms. In other words, it must be considered that planning, project interventions and other power-ridden processes of rational organizing are themselves influencing social risk and vulnerability.

'Transformation'

When invoked in the most generalized sense, the term transformation denotes a fundamental, non-linear change to the functioning of a system. Occasionally, transformation might proceed in a predesigned or consciously steered fashion, while in other cases it might materialize as an abrupt change between different systemic equilibria. The optimistic concept of deliberate transformation thus includes the possibility to shift from a given trajectory of systemically produced risk and vulnerability to a potentially 'better' path.

Considering the mounting evidence for devastating human effects on the Earth system, it is not hard to imagine what the word 'better' could actually mean with respect to the current state of affairs. The annual Global Risks Report (World Economic Forum 2016, p. 10), for example, identifies "*the failure of climate change mitigation and adaptation*" as the most potentially impactful risk of our time – and the third most likely. Anthropogenic climate change, together with other global megatrends such as urbanization, population growth, environmental degradation and mass migration is likely to cause major disruptions and transformations in our societies. Whether these major transformations can be steered at all is certainly debatable, particularly because the degree to which social institutions are malleable and can be shaped as uniform entities must be carefully assessed on a case-by-case basis. Yet, the argument for transformative adaptation holds that adjusting incrementally to disruptive megatrends such as anthropogenic changes in the Earth system will remain ineffective, unless the systemic aspects of socially produced vulnerability and risk are sufficiently addressed.

Another important argument in favor of transformative institutional pathways is the pervasiveness of rising social inequalities across societies. Inequalities, according to Bebbington *et al.* (2008, p. 3), can be defined as structurally entrenched "differences in people's access to economic opportunities, sociopolitical participation, and ability to live a fulfilling life." In drawing on such a non-monetary definition of inequality, the authors contend that persistent inequalities may be contested either on the grounds of normative or ethical values – which might differ considerably according to a given social context – or else based on purely instrumental reasons such as "strong evidence that inequality can significantly lower both the level and the durability of economic growth" (Ostry *et al.* 2016, p. 41).

It is already implicit in the latter argument that inequality is a normatively contested term. From the perspective of economic *realpolitik*, strong arguments exist in the way of perceiving the productive capacities of societal inequalities through an utilitarian lens. Put differently,

making an ethical argument for institutional transformation purely on the grounds of reducing inequality would not uniformly resonate across all policy circles, unless instrumental reasons are invoked as well. The example of social inequality therefore illustrates that the practical translation of transformative institutional pathways depends on how the goals behind transformation are discursively framed. Like the idea of reform, transformation can be interpreted in both, a more socially progressive or rather conservative way.

If adhering to a socially progressive interpretation of transformation, institutional trajectories of change are regarded as central to how risks and inequities are produced in the social sphere. The social production of risk is considered to proceed through material as well as symbolic practices of territorialization, resource distribution and discursive normalization. Overall, it is argued that deep transformations of existing institutional structures as well as dominant social, political, and economic paradigms are required to minimize negative institutional effects on social equity and the Earth system.

A conservative interpretation of transformation, in turn, is based on a rather narrow definition of transformation as an agricultural policy approach that advocates for the industrialized Green Revolution model of systemic transformation. In this sense, transformation (a) aims to reform agricultural and food systems on a bigger scale and with greater intensity, (b) entails new types of adaptation innovations such as the introduction of new crop varieties together with new partnerships between institutions, and (c) involves different places and locations (e.g. resettlements) (Grist 2014, p. 4). Such a narrow interpretation of transformation is rather advancing an understanding of transformative change that might align with reformist or adjustment pathways, since it largely ignores paradigmatic questions of social justice as well as the contested political and cultural context in which institutional adaptation pathways unfold.

Presently, political signals concerning the interpretation of transformation in Ghana are rather mixed. On the one hand, there is a strong tendency in relevant agricultural policies to support a conservative approach to systemic transformation, with a clear focus on agriculture (SADA 2010, GSGDA II 2014). On the other hand, however, major climate policy documents also contain strong references to social equity, sustainability and the development related aspects of adaptation (see NCCAS 2010, NCCP 2013). While these references are visibly articulated in key policy documents, there are nonetheless considerable practical challenges for their implementation that will likely require a progressive political interpretation of transformative institutional pathways.

For example, it is clear that unsustainable and socially unjust systemic arrangements will necessitate a fundamental transformation of existing institutional structures and underlying systemic paradigms. These structural challenges of achieving sustainability and equity are not sufficiently covered by a reformist or more conservative transformational agenda. This is the case, for example, if it is assumed that the systemic logic behind dominant organizational arrangements is impartial, or that official risk discourses are normatively and politically neutral.

Seen through the lens of political realism, however, the widening science-policy gap currently hinders productive engagement on transformation across the scientific-practitioner divide. It needs to be clearly communicated that research on transformation and institutional power effects does not automatically equal unproductive finger pointing or political blame shifting. Similarly, it must be clear that transformative adaptation is neither a purely academic concept, nor simply a paternalizing criminalization of Africa, cloaked in discussions about new structural transformations and good governance principles. What the progressive transformative approach aims to do, instead, is adding an important explanatory layer to the relatively narrow debate on the politics of adaptation, inasmuch as it helps to refocus attention on the

people who are directly affected by climate change, and the very institutions, discourses and normative paradigms that contribute to the current politics of unsustainability.

In line with a progressive interpretation of transformative institutional pathways, it is therefore important to remain critical of international development and CCA scholarship that tends to individualize social risk by placing too much hope on the agency of individuals and the all-too nefarious perception of local 'community'. Such perspectives run the risk of glossing over or downplaying the structural impediments that negatively affect household adaptiveness. These structural constraints include macro-economic factors such as the pervasive lack of diversified non-farm based livelihood mixes, youth unemployment, rigid gender roles and gendered perceptions, a low access to quality education, as well as large-scale trajectories of land acquisition and dispossession that intersect with elite capture and structural marginalization. Such structural and development related challenges far exceed the reaches of agricultural transformation efforts, which at best encompass particular institutional constellations that nevertheless possess bounded spheres of influence. The following scenario therefore assumes that adjustment as well as reformist and transformative institutional pathways will always have to contend with the possibility of regressive forces that might move particular pathway trajectories toward business-as-usual.

'Business-As-Usual'

This pathway scenario describes business-as-usual trajectories, which are neither stable nor static in their own right. They rather entail hybrid institutional arrangements that combine with adjustment, reformist and even transformative pathways to varying degrees. Hence business-as-usual pathways are by no means monolithic. In the face of attempts at institutional adjustment or reform, business-as-usual may entail the reaping of political or material gains from resistance to social

change, or refer to processes of sabotage or hijacking that undermine ongoing adaptation actions.

Transient institutional arrangements set up by donor-funded projects further reinforce such business-as-usual tendencies. As soon as new institutional arrangements are introduced, for instance in the form of new development initiatives, management committees, or marketing schemes, they are naturalized into existing social orders and often diverted from their intended purpose through subliminal relations of power and renegotiation in local power sharing arrangements. In the worst case scenario, business-as-usual may therefore encompass situations in which no sustainable long-term adaptation is undertaken at all. Infrastructural adjustment interventions such as the building of bridges and irrigation canals, for example, rarely include provisions for collective and inter-group maintenance into their project design, often leaving the physical infrastructure in disrepair and disuse after several years.

One of the most compelling features of the business-as-usual scenario, however, is what has previously been termed the 'politics of indeterminacy'. More evident in donor-driven discourses of risk and large-scale political processes such as decentralization, indeterminacy refers to scenarios in which normative ambiguities, structural voids or processual gaps arise as a result of social change or political reform. Such institutional voids, overlapping normative reference systems and processual gaps are generative in themselves, in the sense that they open up new opportunities for regulatory capture and profiteering. In such contexts, patronage ties and elite networks may encourage socially entrenched practices like clientelism, corruption and rent-seeking behavior. While these practices usually reinforce deep-seated power asymmetries, for instance in cases where resource flows, subsidies or 'pro-poor' interventions are diverted from their intended use, they are also grounded in subliminal power relations that have barely been addressed by steered trajectories of institutional adjustment, reformist or transformative change. One such pervasive constellation

that arises from deep-seated political indeterminacies and normative pluralism has been identified by Laube (2007, p. 324) as "triangles of accommodation", referring to patron-client relations comprising (neo) traditional authorities, local administrative elites and large-scale commercial farmers.

At the same time, the findings of the discourse analysis have shown how international donor organizations and agencies are influencing technical governance discourses by identifying cause-and-effect connections, and by suggesting 'appropriate' adaptation responses. Indubitably, international development agencies exert a good amount of influence on sector-specific policies in Ghana, including climate change adaptation. Sometimes this influence is clearly visible, for instance through direct budget support, policy mainstreaming, assistance with report writing, and donor representation in political bodies. In other cases, donor influence is more subtle, and framed as 'technical' assistance. This may include the operationalization of risk and vulnerability assessments, the selection of pilot studies as well as and the interpretation of technical concepts such as adaptation, often in line with private economic interests at the level of implementation. Thus, in view of the accelerating commodification and 'neoliberalization' of the transformative development paradigm – especially in the agricultural and forestry sectors – there is little reason to value third party consultation as essentially objective and without motive.

As previously discussed, regulatory capture together with lobbying efforts by special interest groups can lead to intransparent socio-political processes that encourage the cooptation of natural resource regimes as well as the accelerated commercialization of environmental resources in ways that countervail core principles of environmental sustainability and climate justice. Coupled with agricultural intensification, uncontrolled urbanization and large-scale land acquisition, donor-driven calls for a new 'Green Revolution' in Africa may veritably portend an empty promise, if institutional questions about the

'capacity' of individuals and/or households to be endogenously adaptive are not addressed first.

Put differently, the use of a concept such as adaptive 'capacity' is highly problematic, unless it is acknowledged that individuals or groups are often highly capable, while still being vulnerable as a result of structural or contextual factors that are not of their own making. For example, more coordinated CCA and DRR approaches are still missing when it comes to addressing the negative impacts of macro-level social dynamics such as persistent decentralization challenges, the absence of non-farm economic opportunities, and the erosion of social support networks beyond the core family. Together with poverty related concerns and a lack of coordination among donors and government agencies across sectors, this situation contributes to patchy policy implementation and leads to unreliable organizational support mechanisms for local populations. Thus, assuming that the main goal of adaptation is to reduce socially produced risks, and to strengthen collective actions to avoid risks, ambitious political goals should not be neglected, even if the interpretation of the transformative development agenda still remains a controversial political issue in Ghana.

Directions for Future Research

Based on the previously discussed adaptation pathways, a number of possible avenues for future research have been identified. These research recommendations are by no means exhaustive, and relate to the concrete questions and uncertainties that emerge from the empirical findings of the study.

- ❖ First, it is recommended to better integrate the institutional pathways approach with projections for future climatic and land use change. Integrated scenario development with a strong emphasis

on the institutional dimensions of social-ecological change can further increase the robustness of pathway scenarios. It also allows for realistic and flexible adaptation planning that integrates multiple pathway options into a coherent strategic framework. At the same time, the results of the institutional pathways analysis can be used to reflect on concrete institutional arrangements that are needed to implement existing adaptation strategies and achieve the key goals of the National Climate Change Policy. In this context, it will be beneficial to identify synergies between institutional adaptation pathways and the Akropong Approach.

- ❖ Secondly, it is important to further examine how the science-policy gap can be bridged and a continuous civil society dialogue can be initiated to better communicate the need for socially inclusive institutional transformation to decision makers, bearing in mind that business-as-usual and adjustment adaptation pathways will not be sufficient to avoid maladaptation.
- ❖ Similarly, it is crucial to better integrate social science research on institutional pathways into adaptation planning and project implementation to avoid prolonged social conflict, and to ensure that marginalized groups as well as various interests are accurately reflected from the outset. Instead of supposing that communities are socially homogenous, or that public participation and decision making are inherently neutral, a pathways approach can facilitate more inclusive deliberations that seek to integrate the interests, expectations and perceptions of various user groups into long-term, resource-oriented adaptation planning.
- ❖ Overall, the implementation of planned adaptation actions needs to proceed from the assumption that institutional pathways are dynamic, contested, and must be subject to revision or renegotiation to achieve their long-term goals and remain flexible under changing conditions. Hence it is necessary to intensify social science research on business-as-usual scenarios and long-term oversight to prevent ineffective, unsustainable, or patchy policy implementation.

- ❖ With regard to the agricultural sector, it is recommended to better integrate scientific findings about the economic opportunities of Ecological Organic Agriculture (EOA) into existing agricultural reform and transformation strategies to avoid a one-sided focus on conventional 'Green Revolution' modernization pathways that can be socially and environmentally risky. At the same time, there is the need to further investigate how an enabling institutional environment for urban agriculture may be created to improve the food security and adaptiveness of urban households under conditions of rapid urbanization.
- ❖ Moreover, it is important to realize that contemporary urbanization in Ghana mainly proceeds through the growth of smaller and medium sized cities, while existing scholarship is still primarily focused on a limited number of larger cities such as Accra, Kumasi and Tamale. Thus, more research on dynamic urbanization and peri-urbanization processes, as well as on changing livelihood patterns in Ghana's smaller and medium sized cities is needed. This also includes more comparative research on the determinants of household adaptiveness and service provision across the dynamic rural-urban continuum.
- ❖ In addition, there is certainly the need for more comparative research on complex institutional territorialization processes and locally situated risks that vary across regions.
- ❖ The empirical findings of the study also reveal that it is crucial for improving food security and household adaptiveness to avoid a narrow analytical focus on patterns of access to infrastructure, credit, services, inputs, markets, etc. Existing problems of utilization, quality control and long-term reliability need to be addressed as well. More and better research on these specific aspects of household adaptiveness is urgently required.
- ❖ Future research will also have to address the converging structural problems of unfinished political and fiscal decentralization, as well as the challenges related to conflicting and/or overlapping political mandates. Unfinished decentralization still hinders the

effective coordination and implementation of proposed adaptation actions, especially at the sub-district level. Yet, how exactly structural reforms could be carried out despite a long history of political resistance at the level of the central government is far from being clear.

- ❖ In the key area of climate finance, it is important to build necessary organizational capacities to access and manage international funding streams. Since additional investments will be a prerequisite for successful adaptation in the short and long term, further scientific support in this endeavor is required.
- ❖ Lastly, adaptation scholars may wish to seize the opportunity to become more actively involved in debates about social transformations, applied ethics and climate justice, not merely to bring their own views to the table, but also to regularly reflect on their practical experience.

This study has contributed to such an endeavor.

REFERENCES

- Abbott, M.**, 2012. No Life is Bare, the Ordinary is Exceptional: Giorgio Agamben and the Question of Political Ontology. *Parrhesia* 14: 23-36.
- Adger, W.N.**, 2006. Vulnerability. *Global Environmental Change* 16 (3): 268-281.
- Adger, W.N., Dessai, S., Goulden, M., Hulme, M., Lorenzoni, I., Nelson, D., Naess, L., Wolf, J., Wreford, A.**, 2009. Are there social limits to adaptation to climate change? *Climatic Change* 93 (3): 335-354.
- Adger, W.N., Kelly, P.M.**, 1999. Social vulnerability to climate change and the architecture of entitlements. *Mitigation and Adaptation Strategies for Global Change* 4 (3-4): 253-266.
- Adongo, T.A., Kugbe, J.X., Gbedzi, V.D.**, 2014. Siltation of the Reservoir of Veia Irrigation Dam in the Bongo District of the Upper East Region, Ghana. *International Journal of Science and Technology* 4 (12) [[online](#)].
- Afful-Koomson, T.**, 2015. The Green Climate Fund in Africa: what should be different? *Climate and Development* 7 (4): 367-379.
- African Economic Outlook**, 2012. *Ghana Country Note*. Issy les Moulineaux: OECD Development Centre [[online](#)].
- African Union**, 2014. *Agenda 2063. The Africa We Want*. Second edition. Addis Ababa [[online](#)].
- Agrawal, A.**, 2010. Local Institutions and Adaptation to Climate Change, in: Mearns, R., Norton, A. (eds.) *Social Dimensions of Climate Change. Equity and Vulnerability in a Warming World*. Washington, DC: The World Bank, 173-198.
- Agrawal, A., Perrin, N.**, 2009. Climate adaptation, local institutions and rural livelihoods, in: Adger, W.N., Lorenzoni, I., O'Brien, K.L. (eds.) *Adapting to Climate Change: Thresholds, Values, Governance*. Cambridge, UK: Cambridge University Press, 350-367.

- Agyare**, W.A., Kyei-Baffour, N., Ayariga, R., Gyasi, K.O., Barry, B., Ofori, E., 2009. Irrigation Options in the Upper East Region of Ghana, in: Humphreys, E., Bayot, R.S. (eds.) *Increasing the productivity and sustainability of rainfed cropping systems of poor smallholder farmers*. Proceedings of the CGIAR Challenge Program on Water and Food International Workshop on Rainfed Cropping Systems, Tamale, Ghana, 22-25 September 2008. Colombo: CGIAR, 259-268.
- Albrecht**, R., 1991. The Utopian Paradigm – A Futurist Perspective. *Communications* 16 (3): 283-318.
- Al-Hassan**, S., 2015. Food Security in the Upper East Region of Ghana: A Situational Analysis. *UDS International Journal of Development* 2 (1): 69-85 [[online](#)].
- 2013. Reducing Poverty in Northern Ghana through the Savannah Accelerated Development Authority, in: Yaro, J.A. (ed.) *Rural Development in Northern Ghana*. New York: Nova Science Publishers, 225-244.
- Amanor**, K.S., Pabi, O., 2007. Space, Time, Rhetoric and Agricultural Change in the Transition Zone of Ghana. *Human Ecology* 35 (1): 51-67.
- Amundsen**, H., Berglund, F., Westskog, H., 2010. Overcoming barriers to climate change adaptation – a question of multilevel governance? *Environment and Planning C: Government and Policy* 28 (2): 276-289.
- Andreasson**, S., 2005. Orientalism and African Development Studies: The 'Reductive Repetition' Motif in Theories of African Underdevelopment. *Third World Quarterly* 26 (6): 971-986.
- Antwi-Agyei**, P., Dougill, A.J., Stringer, L.C., 2015. Barriers to climate change adaptation: evidence from northeast Ghana in the context of a systematic literature review. *Climate and Development* 7 (4): 297-309.
- Aoki**, M., 2001. *Toward a Comparative Institutional Analysis*. Cambridge, MA: MIT Press.

- Artur, L., Hilhorst, D., 2012.** Everyday realities of climate change adaptation in Mozambique. *Global Environmental Change* 22: 529-536.
- Arku, F.S., 2012.** Rainfall Data as a Case for Investigation into Climate Change in Ghana. *International Journal of Basic and Applied Sciences* 1 (4): 347-362.
- Armah, F.A., Odoi, J.O., Yengoh, G.T., Obiri, S., Yawson, D.O., Afrifa, E.K., 2011.** Food security and climate change in drought-sensitive savanna zones of Ghana. *Mitigation And Adaptation Strategies For Global Change* 16 (3): 291-306.
- Atkisson, A., 2010.** *The Sustainability Transformation. How to Accelerate Positive Change in Challenging Times.* London and Washington, DC: Earthscan.
- Awedoba, A.K., 2010.** *An Ethnographic Study of Northern Ghanaian Conflicts: Towards a Sustainable Peace.* Accra: Sub-Saharan Publishers.
- Ayers, J., 2011.** Resolving the Adaptation Paradox: Exploring the Potential for Deliberative Adaptation Policy-Making in Bangladesh. *Global Environmental Politics* 11 (1): 62-88.
- Ayers, J., Dodman, D., 2010.** Climate change adaptation and development I: the state of the debate. *Progress in Development Studies* 10 (2): 161-168.
- Baehr, P., 2001.** The "Iron Cage" and the "Shell as Hard as Steel": Parsons, Weber, and the Stahlhartes Gehäuse Metaphor in the Protestant Ethic and the Spirit of Capitalism. *History and Theory* 40 (2): 153-169.
- Baffour-Awuah, 2013.** *Preparation of a National Thematic Study in Preparation for the 2014 ADEA Regional Event on Youth Employment in Africa: "Effectiveness of Ghana's Targeted Actions to Promote Youth Employment."* Ghana Country Report (Final Draft). Tema: Workforce Development Institute [[online](#)].
- Barry, B., Kortatsi, B., Forkuor, G., Gumma, M.K., Namara, R., Rebelo, L.-M., van den Berg, J., Laube, W., 2010.** *Shallow groundwater in the Atankwidi Catchment of the White Volta Basin: Current status and*

- future sustainability* (IWMI Research Report 139). Colombo: International Water Management Institute (IWMI).
- Bassett, T.J., Fogelman, C.,** 2013. Déjà vu or something new? The adaptation concept in the climate change literature. *Geoforum* 48: 42-53.
- Baudoin, M., Henly-Shepard, S., Fernando, N., Sitati, A., Zommers, Z.,** 2014. *Early warning systems and livelihood resilience: Exploring opportunities for community participation* (UNU-EHS Working Paper Series, No.1). Bonn: United Nations University Institute of Environment and Human Security (UNU-EHS).
- Bauman, Z.,** 2000. *Liquid Modernity*. Cambridge: Polity Press.
- Beck, U.,** 2009. Critical Theory of World Risk Society: A Cosmopolitan Vision. *Constellations* 16 (1): 3-22.
- Bebbington, A.J., Dani, A.A., de Haan, A., Walton, M.,** 2008. Inequalities and development: dysfunctions, traps, and transitions, in: Bebbington, A.J., Dani, A.A., de Haan, A., Walton, M. (eds.) *Institutional pathways to equity: addressing inequality traps*. Washington, DC: The International Bank for Reconstruction and Development/The World Bank, 3-44.
- Bee, B., Biermann, M., Tschakert, P.,** 2013. Gender, Development, and Rights-Based Approaches: Lessons for Climate Change Adaptation and Adaptive Social Protection, in: Alston, M., Whittenbury, K. (eds.) *Research, Actions and Policy: Addressing the Gendered Impacts of Climate Change*. Dordrecht: Springer, 95-108.
- Béland, D., Cox, R.H.,** 2011. *Ideas and Politics in Social Science Research*. New York: Oxford University Press.
- Benda-Beckmann, K.,** 1981. Forum shopping and shopping forums: Dispute processing in a Minangkabau village in West Sumatra. *Journal of Legal Pluralism* 19: 117-159.
- Bendig, M., Giesbert, L., Steiner, S.,** 2009. *Savings, Credit and Insurance: Household Demand for Formal Financial Services in Rural Ghana* (GIGA Working Paper No. 94). Hamburg: German Institute of Global and Area Studies (GIGA).

- Berger, P.L., Luckmann, T., 1966.** *The Social Construction of Reality: A Treatise in the Sociology of Knowledge*. Garden City, NY: Anchor Books.
- Bevir, M., 1999.** Foucault, Power, and Institutions. *Political Studies* XLVII: 345-259.
- Bianchin, M., 2015.** From joint attention to communicative action: Some remarks on critical theory, social ontology and cognitive science. *Philosophy and Social Criticism* 41 (6): 593-608.
- Bicchieri, C., 2006.** *The Grammar of Society: the Nature and Dynamics of Social Norms*. New York: Cambridge University Press.
- Biggs, R., Westley, F.R., Carpenter, S.R., 2010.** Navigating the back loop: fostering social innovation and transformation in ecosystem management. *Ecology and Society* 15 (2): 9 [[online](#)].
- Birkmann, J., 2006.** Measuring Vulnerability to Promote Disaster-resilient Societies: Conceptual Frameworks and Definitions, in: Birkmann, J. (ed.) *Measuring Vulnerability to Natural Hazards – Towards Disaster Resilient Societies*. Tokyo: United Nations University Press, 9-54.
- Bloch, E., 1977.** Nonsynchronism and the Obligation to Its Dialectics. *New German Critique* 11: 22-38.
- Blühdorn, I., 2011.** The Politics of Unsustainability: COP 15, Post-Ecologism, and the Ecological Paradox. *Organization & Environment* 24 (1): 34-53.
- BMBF, 2014.** *German-African Cooperation in Education and Research* (BMBF Africa Days 16-18 March, 2014). Bonn and Berlin: Federal Ministry of Education and Research [[online](#)].
- Bolgatanga Municipal Assembly, 2015.** *The composite budget of the Bolgatanga Municipal Assembly for the 2015 fiscal year*. Bolgatanga.
- 2010. *Medium Term Development Plan (2010-2013)*. Bolgatanga.
- Bourdieu, P., 2002.** Against the Policy of Depoliticization. *Studies in Political Economy* 69: 31-41.
- Bracking, S., 2015.** The Anti-Politics of Climate Finance: The Creation and Performativity of the Green Climate Fund. *Antipode* 47 (2): 281-302.

- Braidotti, R.**, 2013. 'Becoming-world', in: Braidotti, R., Hanafin, P., Blaagaard, B.B. (eds.) *After Cosmopolitanism*. Abingdon and New York: Routledge, 8-27.
- Brass, P.R.**, 2000. Foucault steals political science. *Annu. Rev. Polit. Sci.* 3: 305-330.
- Brooks, N., Grist, N., Brown, K.**, 2009. Development Futures in the Context of Climate Change: Challenging the Present and Learning from the Past. *Development Policy Review* 27 (6): 741-765.
- Brown, K.**, 2012. Policy discourses of resilience, in: Pelling, M., Manuel-Navarrete, D., Redclift, M. (eds.) *Climate change and the crisis of capitalism. A chance to reclaim self, society and nature*. Oxford: Routledge, 37-50.
- Brown, W.**, 2006. Power After Foucault, in: Dryzek, J., Honig, B., Phillips, A. (eds.) *The Oxford Handbook of Political Theory*. Oxford: Oxford University Press, 65-84.
- Buadi, D.K., Anaman, K.A., Kwarteng, J.A.**, 2013. Farmers' perceptions of the quality of extension services provided by non-governmental organisations in two municipalities in the Central Region of Ghana. *Agricultural Systems* 120: 20-26.
- Burch, S.**, 2010. Transforming barriers into enablers of action on climate change: insights from three municipal case studies in British Columbia, Canada. *Global Environmental Change* 20 (2): 287-297.
- Butler, J.R.A., Bohensky, E.L., Suadnya, W., Yanuartati, Y., Handayani, T., Habibi, P., Puspadi, K., Skewes, T.D., Wise, R.M., Suharto, I., Park, S.E., Sutaryono, Y.**, 2016. Scenario planning to leap-frog the Sustainable Development Goals: An adaptation pathways approach. *Climate Risk Management* 12: 83-99.
- Cameron, C.**, 2011. *Climate Change Financing and Aid Effectiveness: Ghana Case Study*. Paris: OECD [[online](#)].
- Cannon, T., Müller-Mahn, D.**, 2010. Vulnerability, resilience and development discourses in context of climate change. *Natural Hazards* 55: 621-635.

- Carter**, M.R., 2010. *Searching for A New Ending to the Same Old Story about Risk: A Pilot Project & Research Agenda* (Presentation held at the International Food Policy Research Institute, Washington, DC, January 29, 2010) [[online](#)].
- CFSVA**, 2012. *Ghana Comprehensive Food Security and Vulnerability Analysis. Focus on Northern Ghana*. Rome: World Food Programme.
- Chamberlin**, J., 2008. *It's a small world after all. Defining smallholder agriculture in Ghana* (IFPRI Discussion Paper No. 00823). Washington, DC: International Food Policy Research Institute.
- Chant**, S., Jones, G.A., 2005. Youth, Gender and Livelihoods in West Africa: Perspectives from Ghana and The Gambia. *Children's Geographies* 3 (2): 185-199.
- Clarke**, L., Jiang, K., Akimoto, K., Babiker, M., Blanford, G., Fisher-Vanden, K., Hourcade, J.-C., Krey, V., Kriegler, E., Löschel, A., McCollum, D., Paltsev, S., Rose, S., Shukla, P.R., Tavoni, M., van der Zwaan, B., van Vuuren, D.P., 2014. Chapter 6: Assessing transformation pathways, in: *Climate Change 2014: Mitigation of Climate Change. Contribution of Working Group III to the Fifth Assessment Report of the Intergovernmental Panel on Climate Change*. Cambridge: Cambridge University Press, 413-510 [[online](#)].
- Cleaver**, F., 2012. *Development through Bricolage: Rethinking Institutions for Natural Resource Management*. Oxford: Routledge.
- Coirolo**, C., Rahman, A., 2014. Power and differential climate change vulnerability among extremely poor people in Northwest Bangladesh: lessons for mainstreaming. *Climate and Development* 6 (4): 336-344.
- Cooper**, R., Law, J., 1995. Organization: Distal and Proximal Views. *Research in the Sociology of Organizations* 13: 237-274.
- Cornwall**, A., Eade, D. (eds.), 2010. *Deconstructing Development Discourse. Buzzwords and Fuzzwords*. Rugby: Practical Action Publishing.
- Craig**, R.K., 2010. 'Stationarity is dead' – long live transformation: five principles for climate change adaptation law. *Harvard Environmental Law Review* 34: 9-73.

- CREW Project**, 2012. *Community Resilience through Early Warning: Project Document*. Accra: National Disaster Management Organisation (NADMO) [[online](#)].
- Crichton**, D., 1999. The Risk Triangle, in: Ingleton, J. (ed.) *Natural Disaster Management*. London: Tudor Rose, 102-103.
- Crutzen**, P.J., Schwägerl, C., 2011. Living in the Anthropocene: Toward a New Global Ethos. *Yale Environment 360* [[online](#)].
- Daily Guide**, 2012. *River-god Stops \$2m Project*. Published: 2012-09-11 [[online](#)].
- Dasgupta**, A., Baschieri, A., 2010. Vulnerability to climate change in rural Ghana: Mainstreaming climate change in poverty-reduction strategies. *Journal of International Development* 22 (6): 803-820.
- Davoudi**, S., 2012. Resilience: A Bridging Concept or a Dead End? *Planning Theory & Practice* 13 (2): 299-307.
- Deacon**, T.W., 2014. Language as an Emergent Function: Some Radical Neurological and Evolutionary Implications, in: Geertz, A.W., Jensen, J.S. (eds.) *Religious Narrative, Cognition and Culture. Image and Word in the Mind of Narrative*. Abingdon and New York: Routledge, 51-66.
- Dembour**, M.-B., 2010. What Are Human Rights? Four Schools of Thought. *Human Rights Quarterly* 32: 1-20.
- Derrida**, J., 1990. Force de Loi: "Fondement Mystique de l'Autorité". *Cardozo Law Review* 11: 919-1045.
- DESA**, 2015. *The Addis Ababa Action Agenda of the Third International Conference on Financing for Development*. New York: United Nations Department of Economic and Social Affairs [[online](#)].
- De Sardan**, J.P.O., 2009. *The eight modes of local governance in West Africa* (Africa Power And Politics Programme Working Paper No. 4). London: Overseas Development Institute (ODI) [[online](#)].
- 2008. *Researching the practical norms of real governance in Africa* (Africa Power And Politics Programme Discussion Paper No. 5). London: Overseas Development Institute (ODI) [[online](#)].
- Dietz**, T., Millar, D., Dittoh, S., Obeng, F., Ofori-Sarpong, E., 2004. Climate and Livelihood Change in North East Ghana, in: Dietz, A.J.,

- Ruben, R., Verhagen, A. (eds.) *The Impact of Climate Change on Drylands, with a Focus on West Africa*. Dordrecht, Boston and London: Kluwer Academic Publishers, 149-172.
- DiMaggio**, P.J., Powell, W.W., 1991. Introduction, in: Powell, W.W., DiMaggio, P.J. (eds.) *The new institutionalism in organizational analysis*. Chicago: University of Chicago Press, 1-40.
- Dobbin**, F., 1994. Cultural models of organization: The social construction of rational organizing principles. *The sociology of culture*, 117-142.
- Dovers**, S.R., Hezri, A.A., 2010. Institutions and policy processes: the means to the ends of adaptation. *WIRE's Climate Change* 1: 212-231.
- DPCU**, 2010. *Strategic Environmental Assessment of Bongo District Medium-Term Development Plan from 2010–2013 under the National Framework*. Bongo: District Planning and Coordinating Unit.
- Drechsel**, P., Keraita, B. (eds.), 2014. *Irrigated urban vegetable production in Ghana: characteristics, benefits and risk mitigation*. 2nd ed. Colombo: International Water Management Institute (IWMI).
- Driessen**, P.P.J. [...], 2012. *Societal transformations in the face of climate change. Research priorities for the next decade*. Brussels: JPI Climate [[online](#)].
- Drucker-Brown**, S., 2001. House and hierarchy: Politics and domestic space in northern Ghana. *Journal of the Royal Anthropological Institute* 7(4): 669-685.
- Dryzek**, J.S., 1996. The Informal Logic of Institutional Design, in: Goodin, R.E. (ed.) *The Theory of Institutional Design*. Cambridge, UK: Cambridge University Press, 103-125.
- Durkheim**, E., [1895] 1982. *The Rules of Sociological Method and Selected Texts on Sociology and its Method*. New York: Free Press.
- Eakin**, H., Luers, A.L., 2006. Assessing the Vulnerability of Social-Environmental Systems. *Annual Review of Environment and Resources* 31 (1): 365-394.
- Eder**, K., 1973. Komplexität, Evolution und Geschichte, in: Maciejewski, F. (ed.) *Theorie der Gesellschaft oder Sozialtechnologie – Beiträge*

zur *Habermas-Luhmann-Diskussion*. Supplement I. Frankfurt am Main: stw, 9-13.

- Eguavoen, I.**, 2008. *The Political Ecology of Household Water in Northern Ghana*. Münster: LIT Verlag.
- Eguavoen, I., Schulz, K., De Wit, S., Weisser, F., Müller-Mahn, D.**, 2015. Political Dimensions of Climate Change Adaptation. Conceptual Reflections and African Examples, in: Leal Filho, W. (ed.) *Handbook of Climate Change Adaptation (Part II)*. Berlin and Heidelberg: Springer, 1183-1199.
- Eguavoen, I., Schraven, B.**, 2013. The Ambiguous Representation of the Savanna Landscape and its New Political Relevance in Ghana, in: Yaro, J.A. (ed.) *Rural Development in Northern Ghana*. New York: Nova Science Publishers, 207-224.
- Eickhof, T.**, 2010. *Climate Change and Water Storage: Opportunities and Limitations for Increasing Adaptive Capacity in the Veve Catchment, Northern Ghana* (Unpublished Diploma Thesis). Berlin: Humboldt University.
- Eisenhauer, D.C.**, 2016. Pathways to Climate Change Adaptation: Making Climate Change Action Political. *Geography Compass* 10 (5): 207-221.
- England, P.**, 1995. Tree Planting, Sustainable Development and the Roles of Law in Bongo, North-East Ghana. *Journal of African Law* 39 (2): 138-155.
- Ensminger, J.**, 1998. Anthropology and the New Institutionalism. *Journal of Institutional and Theoretical Economics* 154 (4): 774-789.
- Enwezor, O.**, 2010. Modernity and postcolonial ambivalence. *South Atlantic Quarterly* 109 (3): 595-620.
- EOA**, 2015. *Ecological Organic Agriculture (EOA)-Initiative. 2015-2025 Strategic Plan*. Prepared by BIOVISION Africa Trust on behalf of the EOA Continental Steering Committee [[online](#)].
- EPA**, 2013. *Ghana's National Development Planning, Climate Change and Disaster Risk Reduction* (EPA Policy Advice Series Vol. 1). Accra: Environmental Protection Agency.

- EPA, 2007. *Climate Change and the Ghanaian Economy*. Accra: Environmental Protection Agency.
- Ericson, R.V., 2007. *Crime in an Insecure World*. Cambridge, UK: Polity Press.
- Eriksen, S., Lind, J., 2009. Adaptation as a Political Process: Adjusting to Drought and Conflict in Kenya's Drylands. *Environmental Management* 43: 817-835.
- Fairhead, J., Leach, M., 1996. *Misreading the African Landscape: Society and Ecology in a Forest-savanna Mosaic*. Cambridge: Cambridge University Press.
- FAO, 2012. *Gender inequalities in rural employment in Ghana: An overview*. Rome: United Nations Food and Agriculture Organization.
- Fawcett, P., Marsh, D., 2014. Depoliticisation, governance and political participation. *Policy & Politics* 42 (2): 171-188.
- Ferguson, J., 2010. The uses of neoliberalism. *Antipode* 41 (Issue Supplement s1): 166-184.
- 2006. *Global Shadows. Africa in the Neoliberal World Order*. Durham and London: Duke University Press.
- 1990. *The Anti-Politics Machine. "Development," depoliticization and bureaucratic power in Lesotho*. Cambridge: Cambridge University Press.
- Ferkany, M., Whyte, K.P., 2012. The importance of participatory virtues in the future of environmental education. *Journal of Agricultural and Environmental Ethics* 25 (3): 419-434.
- Fianko, J.R., Donkor, A., Lowor, S.T., Yeboah, P.O., 2011. Agrochemicals and the Ghanaian environment, a review. *Journal of Environmental Protection* 2 (3): 221-230.
- Fine, G.A., 2001. Enacting Norms: Mushrooming and the Culture of Expectations and Explanations, in: Hechter, M., Opp, K.-D. (eds.) *Social Norms*. New York: Russell Sage Foundation, 139-164.
- FitzGibbon, J., Mensah, K.O., 2012. Climate Change as a Wicked Problem: An Evaluation of the Institutional Context for Rural Water Management in Ghana. *SAGE Open*: 1-14 [online].

- Flinders, M., Wood, M., 2014.** Depoliticisation, governance and the state. *Policy & Politics* 42 (2): 135-149.
- Fosu-Mensah, B.Y., Vlek, P.L.G., MacCarthy, D.S., 2012.** Farmers' perception and adaptation to climate change: a case study of Sekyedumase district in Ghana. *Environment, Development and Sustainability* 14 (4): 495-505.
- Foti, J., Flores-Bedregal, T., Saeed, A.R., 2011.** *Demand for Climate Change Governance: An Approach with Case studies from Ghana and Bolivia*. WRI Working Paper. Washington DC: World Resources Institute [[online](#)].
- Frimpong, S., Asuming-Brempong, S., 2013.** Comparative Study of Determinants of Food Security in Rural and Urban Households of Ashanti Region, Ghana. *International Journal of Economics and Management Sciences* 2 (10): 29-42 [[online](#)].
- Fuchs, C., 2009.** Towards a critical theory of information. *TripleC* 7 (2): 243-292.
- Funtowicz, S.O., Ravetz, J.R., 1993.** The Emergence of Post-Normal Science, in: von Schomberg, R. (ed.) *Science, Politics and Morality. Scientific Uncertainty and Decision Making*. Dordrecht: Springer, 85-123.
- Füssel, H.M., 2007.** Vulnerability: a generally applicable conceptual framework for climate change research. *Global Environmental Change* 17 (2): 155-167.
- Future Earth, 2013.** *Future Earth Initial Design: Report of the Transition Team*. Paris: International Council for Scientific Unions (ICSU) [[online](#)].
- Gabrilopoulos, N., Mather, C., Apentiik, C.R., 2002.** Lineage Organisation of the Tallensi Compound: The Social Logic of Domestic Space in Northern Ghana. *Africa* 72 (2): 221-244.
- Gaillard, J.C., 2010.** Vulnerability, Capacity and Resilience: Perspectives for Climate and Development Policy. *Journal of International Development* 22: 218-232.
- Gallagher, M., 2008.** Foucault, Power and Participation. *The International Journal of Children's Rights* 16 (3): 395-406.

- Gallopín, G.C.**, 2006. Linkages between vulnerability, resilience, and adaptive capacity. *Global Environmental Change* 16 (3): 293-303.
- Gaventa, J.**, 2003. *Power after Lukes: An overview of theories of power since Lukes and their application to development* (draft paper). Sussex: Institute of Development Studies [[online](#)].
- Gerring, J., Yesnowitz, J.**, 2006. A Normative Turn in Political Science? *Polity* 38 (1): 101-133.
- GFDRR**, 2009. *Disaster Risk Management Programs for Priority Countries*. Global Facility for Disaster Reduction and Recovery.
- Ghana Goes for Green Growth**, 2010. *National engagement on climate change. Discussion document*. Accra: The Ministry of Environment, Science, Technology and Innovation (MESTI).
- Ghana News Agency**, 2013a. *Upper East REGSEC orders continuation of work on Veia Irrigation Dam*. Published: 2013-01-16 [[online](#)].
- 2013b. *Upper East RCC asked to act swiftly to prevent donors from taking back funds*. Published: 2013-01-6 [[online](#)].
- Ghana Web**, 2013. *A press statement by the youth of Veia on the occasion of the brutish murder of Mr. Azaare Aniah*. Published 2013-02-10 [[online](#)].
- Girot, P., Ehrhart, C., Oglethorpe, J.**, 2012. *Integrating Community and Ecosystem-Based Approaches in Climate Change Adaptation Responses*. Ecosystem & Livelihoods Adaptation Networks (ELAN) [[online](#)].
- GLSS 6**, 2014a. *Ghana Living Standards Survey. Report of the Sixth Round. Poverty Profile in Ghana (2005-2013)*. Accra: Ghana Statistical Service (GSS).
- 2014b. *Ghana Living Standards Survey. Report of the Sixth Round. Labour Force Report*. Accra: Ghana Statistical Service (GSS).
- GLSS 5**, 2008. *Ghana Living Standards Survey. Report of the Fifth Round*. Accra: Ghana Statistical Service (GSS).
- Golo, B.-W.K., Yaro, J.A.**, 2013. Reclaiming Stewardship in Ghana: Religion and Climate Change. *Nature and Culture* 8 (3): 282-300.
- Government of Ghana (GoG)**, 2015. *The 2015 Budget Statement and Economic Policy of the Government of Ghana. "Transformational Agenda:*

- Securing the Bright Medium Term Prospects of the Economy.* Accra: Ministry of Finance and Economic Planning (MoFEP).
- Government of Ghana (GoG)**, 2014. *National Employment Policy*. Accra: Ministry Of Employment And Labour Relations.
- 2011. *Ghana's Second National Communication to the UNFCCC*. Accra.
- Granderson, A.A.**, 2014. Making sense of climate change risks and responses at the community level: A cultural-political lens. *Climate Risk Management* 3: 55-64.
- Greenwood, R., Oliver, C., Sahlin, K., Suddaby, R.**, 2008. Introduction, in: Greenwood, R., Oliver, C., Suddaby, R., Sahlin, K. (eds.) *The Sage Handbook of Organizational Institutionalism*. Thousand Oaks, CA: Sage, 1-46.
- Grist, N.**, 2014. *Transformative adaptation in Africa's agriculture* (Contribution Note for Africa Progress Panel meeting. "Expert Consultation: an African Agenda for Green, Low Carbon Development", Geneva). London: Overseas Development Institute.
- GSGDA**, 2014. *Medium-Term National Development Policy Framework: Ghana Shared Growth and Development Agenda (GSGDA II), 2014-2017*. Volume I: Policy Framework. Accra: National Development Planning Commission (NDPC).
- 2010. *Medium-Term National Development Policy Framework: Ghana Shared Growth and Development Agenda (GSGDA I), 2010-2013*. Volume I: Policy Framework. Accra: National Development Planning Commission (NDPC).
- GSS**, 2014. *Population and Housing Census (2010) – District Analytical Report Bolgatanga Municipality*. Accra: Ghana Statistical Service (GSS).
- 2013. *Population and Housing Census (2010) – Regional Analytical Report Upper East Region*. Accra: Ghana Statistical Service (GSS).
- 2012. *Population and Housing Census (2010) – Summary Report of Final Results*. Accra: Ghana Statistical Service (GSS).

- Gupta, J., Termeer, C., Klostermann, J., Meijerink, S., van den Brink, M., Jong, P., Nooteboom, S., Bergsma, E., 2010.** The adaptive capacity wheel: a method to assess the inherent characteristics of institutions to enable the adaptive capacity of society. *Environmental Science & Policy* 13 (6): 459-471.
- Gyampoh, B.A., Amisah, S., Idintoba, M., Nkem, J., 2009.** Using traditional knowledge to cope with climate change in rural Ghana. *Unasylva* (English ed.) 60 (231/232): 70-74.
- Haasnoot, M., Kwakkel, J.H., Walker, W.E., ter Maat, J., 2013.** Dynamic adaptive policy pathways: a method for crafting robust decisions for a deeply uncertain world. *Global Environmental Change* 23 (2): 485-498.
- Hackmann, H., St. Clair, A.L., 2012.** *Transformative Cornerstones of Social Science Research for Global Change*. Paris: International Social Science Council [[online](#)].
- Haines, H.H., 1979.** Cognitive Claims-Making, Enclosure, and the Depoliticization of Social Problems. *The Sociological Quarterly* 20 (1): 119-130.
- Hajer, M., Nilsson, M., Raworth, K., Bakker, P., Berkhout, F., de Boer, Y., Rockström, J., Ludwig, K., Kok, M., 2015.** Beyond Cockpiti-ism: Four Insights to Enhance the Transformative Potential of the Sustainable Development Goals. *Sustainability* 7 (2), 1651-1660.
- Hallegatte, S., Lecocq, F., de Perthuis, C., 2011.** *Designing Climate Change Adaptation Policies. An Economic Framework* (Policy Research Working Paper 5568). Washington, DC: The World Bank.
- Haraway, D.J., 1991.** *Simians, Cyborgs, and Women. The Reinvention of Nature*. New York: Routledge.
- Harrison, E., Chiroro, C., 2016.** Differentiated legitimacy, differentiated resilience: beyond the natural in 'natural disasters'. *The Journal of Peasant Studies* (ahead of print): 1-21. doi: 10.1080/03066150.2016.1193011.
- Hesselberg, J., 2013.** Small-Scale Farming and Rural Development in Northern Ghana, in: Yaro, J.A. (ed.) *Rural Development in Northern Ghana*. New York: Nova Science Publishers, 101-122.

- Heve, W.K., Olesen, J.E., Chirinda, N., Adiku, S.G., 2016.** Targeted management of organic resources for sustainably increasing soil organic carbon: Observations and perspectives for resource use and climate adaptations in northern Ghana. *Acta Agriculturae Scandinavica, Section B—Soil & Plant Science* 66 (2): 178-190.
- Himmelstrand, U., 1962.** A Theoretical and Empirical Approach to Depoliticization and Political Involvement. *Acta Sociologica* 6 (1/2): 83-110.
- Hobden, S., 2014.** Posthumanism, in: Death, C. (ed.) *Critical Environmental Politics*. Abingdon and New York: Routledge, 175-183.
- Hodgson, G.M., 2006.** What Are Institutions? *Journal of Economic Issues* 40 (1): 1-25.
- Holling, C.S., 1973.** Resilience and stability of ecological systems. *Annu. Rev. Ecol. Syst.* 4: 1-23.
- Houle, K., Vernon, J. (eds.), 2013.** *Hegel and Deleuze. Together Again for the First Time*. Evanston: Northwestern University Press.
- Hoy, D.C., 2004.** *Critical Resistance. From Poststructuralism to Post-Critique*. Cambridge, MA and London: MIT Press.
- Hulme, M., 2009.** *Why we disagree about climate change: Understanding controversy, inaction and opportunity*. Cambridge: Cambridge University Press.
- Hyogo Framework for Action (2005-2015), 2005.** *Building the Resilience of Nations and Communities to Disasters*. Extract from the report of the World Conference on Disaster Reduction. Geneva: United Nations International Strategy for Disaster Reduction (UNISDR).
- IAASTD, 2009.** *International Assessment of Agricultural Knowledge, Science and Technology for Development*. Global Report (edited by Beverly D. McIntyre et al.). Washington, DC: IAASTD.
- IIED, 2009.** *Participatory learning and action 60: Community-based adaptation to climate change* (edited by Reid, H., Alam, M., Berger, R., Cannon, T., Milligan, A.). London: International Institute for Environment and Development (IIED).

- ILO**, 2005. *Working Out of Poverty in Ghana*. A Case study of the Ghana Decent Work Pilot Programme. Geneva: International Labour Organisation (ILO).
- Immergut**, E.M., 1998. The Theoretical Core of the New Institutionalism. *Politics & Society* 26 (1): 5-34.
- IPCC**, 2014a. *Climate Change 2014: Mitigation of Climate Change. Contribution of Working Group III to the Fifth Assessment Report of the Intergovernmental Panel on Climate Change* [Edenhofer, O., R. Pichs-Madruga, Y. Sokona, E. Farahani, S. Kadner, K. Seyboth, A. Adler, I. Baum, S. Brunner, P. Eickemeier, B. Kriemann, J. Savolainen, S. Schlömer, C. von Stechow, T. Zwickel and J.C. Minx (eds.)]. Cambridge University Press, Cambridge, United Kingdom and New York, NY, USA.
- 2014b. *Climate Change 2014: Impacts, Adaptation, and Vulnerability. Part A: Global and Sectoral Aspects. Contribution of Working Group II to the Fifth Assessment Report of the Intergovernmental Panel on Climate Change* [Field, C.B., V.R. Barros, D.J. Dokken, K.J. Mach, M.D. Mastrandrea, T.E. Bilir, M. Chatterjee, K.L. Ebi, Y.O. Estrada, R.C. Genova, B. Girma, E.S. Kissel, A.N. Levy, S. MacCracken, P.R. Mastrandrea, and L.L. White (eds.)]. Cambridge University Press, Cambridge, United Kingdom and New York, NY, USA.
- 2012. Summary for Policymakers, in: *Managing the Risks of Extreme Events and Disasters to Advance Climate Change Adaptation* [Field, C.B., V. Barros, T.F. Stocker, D. Qin, D.J. Dokken, K.L. Ebi, M.D. Mastrandrea, K.J. Mach, G.-K. Plattner, S.K. Allen, M. Tignor, and P.M. Midgley (eds.)]. A Special Report of Working Groups I and II of the Intergovernmental Panel on Climate Change. Cambridge, UK, and New York: Cambridge University Press, 1-19.
- Jackson**, R., 2010. *Nietzsche – The Key Ideas*. 2nd edition. London: McGraw-Hill.

- Jacob, K., Graaf, L., Bär, H., 2014.** *Transformative Environmental Policy*. Berlin: Freie Universität Berlin, Environmental Policy Research Centre [[online](#)].
- Jamieson, D.W., 2012.** Ethics, Public Policy, and Global Warming, in: Thompson, A., Bendik-Keymer, J. (eds.) *Ethical Adaptation to Climate Change: Human Virtues of the Future*. Cambridge, MA: MIT Press, 187-202.
- Jamieson, D.W., Di Paola, M., 2014.** Climate Change and Global Justice: New Problem, Old Paradigm? *Global Policy* 5 (1): 105-111.
- Janssen, M.A., Schoon, M.L., Ke, W., Börner, K., 2006.** Scholarly networks on resilience, vulnerability and adaptation within the human dimensions of global environmental change. *Global Environmental Change* 16 (3): 240-252.
- Javeline, D., 2014.** The most important topic political scientists are not studying: adapting to climate change. *Perspectives on Politics* 12 (2): 420-434.
- Jayne, T.S., Chamberlin, J., Headey, D.D., 2014.** Land pressures, the evolution of farming systems, and development strategies in Africa: A synthesis. *Food Policy* 48: 1-17.
- Jensen, J.S., 2013.** Normative Cognition in Culture and Religion. *Journal for the Cognitive Science of Religion* 1 (1): 29-45.
- Johnson, R.B., Onwuegbuzie, A.J., Turner, L.A., 2007.** Toward a Definition of Mixed Methods Research. *Journal of Mixed Methods Research* 1 (2): 112-133.
- Jones, L., Boyd, E., 2011.** Exploring social barriers to adaptation: Insights from Western Nepal. *Global Environmental Change* 21 (4): 1262-1274.
- Jones, R.N., Preston, B.L., 2010.** *Adaptation and risk management* (Climate Change Working Paper No. 15). Melbourne: Centre for Strategic Economic Studies, Victoria University [[online](#)].
- Jänicke, M., 2012.** "Green growth": From a growing eco-industry to
- Kates, R.W., Travis, W.R., Wilbanks, T.J., 2012.** Transformational adaptation when incremental adaptations to climate change are insufficient. *PNAS* 109 (19): 7156-7161.

- Keller, R.**, 2013. *Doing Discourse Research. An Introduction for Social Scientists*. London: Sage.
- 2011. The Sociology of Knowledge Approach to Discourse (SKAD). *Human Studies* 34 (1): 43-65.
- 2008. Diskurse und Dispositive analysieren. Die Wissenssoziologische Diskursanalyse als Beitrag zu einer wissenschaftlichen Profilierung der Diskursforschung. *Historical Social Research* 33 (1): 73-107.
- 2005. Analysing Discourse. An Approach From the Sociology of Knowledge. *Forum: Qualitative Social Research* 6 (3) Art. 32, 18 pp. [[online](#)].
- Kemp-Benedict, E.**, Agyemang-Bonsu, W.K., 2008. The Akropong approach to multi-sector project planning. *Futures* 40: 834-840.
- Kenis, A.**, Lievens, M., 2014. Searching for 'the political' in environmental politics. *Environmental Politics* 23 (4): 531-548.
- Kisner, W.**, 2008. The Concrete Universal in Žižek and Hegel. *International Journal of Žižek Studies* 2 (2) (Special Issue on Žižek and Hegel) [[online](#)].
- Konings, P.**, 1981. *Peasantry and State in Ghana: The example of the Veve Irrigation Project in the Upper Region of Ghana* (ASC Working Paper No. 5). Leiden: African Studies Centre [[online](#)].
- Koranteng, R.O.**, Larbi, G.A., 2008. Policy Networks, Politics and Decentralisation Policies in Ghana. *Public Administration and Development* 28: 212-222.
- Kothari, U.**, 2001. Power, Knowledge and Social Control in Participatory Development, in: Cooke, B., Kothari, U. (eds.) *Participation: The New Tyranny?* New York: Zed Books, 139-152.
- Kpessa, M.W.**, 2011. The Politics of Public Policy in Ghana. From Closed Circuit Bureaucrats to Citizenry Engagement. *Journal of Developing Societies* 27 (1): 29-56.
- Kraidy, M.**, 2005. *Hybridity, or the cultural logic of globalization*. Philadelphia: Temple University Press.
- Kroneberg, C.**, 2006. *The Definition of the Situation and Variable Rationality: The Model of Frame Selection as a General Theory of Action* (No.

- 06-05). Sonderforschungsbereich 504. University of Mannheim [online].
- Kruger, J.P.**, 2011. *Transcendence in Immanence – A Conversation With Jacques Derrida on Space, Time and Meaning*. Doctoral dissertation, Pretoria [online].
- Kusi, K.A.**, 2013. *Assessing the impacts of climate change on the availability of stored water for irrigation purposes in the semi-arid areas of Ghana: A Case Study of Tono and Veve Irrigation Projects* (Doctoral dissertation). Kumasi: Kwame Nkrumah University of Science and Technology.
- Kuusaana, E.D., Eledi, J.A.**, 2015. As the city grows, where do the farmers go? Understanding Peri-urbanization and food systems in Ghana-Evidence from the Tamale Metropolis. *Urban Forum* 26 (4): 443-465.
- Kuwornu, J.K.M., Owusu, E.S.**, 2012. Irrigation access and per capita consumption expenditure in farm households: Evidence from Ghana. *Journal of Development and Agricultural Economics* 4 (3): 78-92.
- Lash, S.**, 2007. Power after Hegemony. *Cultural Studies in Mutation? Theory, Culture & Society* 24 (3): 55-78.
- Latour, B.**, 2004. Why Has Critique Run out of Steam? From Matters of Fact to Matters of Concern. *Critical Inquiry* 30 (2): 225-248.
- Laube, W.**, 2016. Climate Change Adaptation, Education, and Rural Transformation in Northern Ghana. Moving Beyond an Agricultural Focus, in: Yaro, J., Hesselberg, J. (eds.): *Adaptation to Climate Change and Variability in Rural West Africa*. Springer International Publishing, 121-145.
- 2009. *Creative bureaucracy: Balancing power in irrigation administration in Northern Ghana* (ZEF Working Paper Series No. 41). Bonn: Center for Development Research.
- 2007. *Changing Natural Resource Regimes in Northern Ghana: Actors, Structures and Institutions*. Berlin: LIT Verlag.

- Laube, W.,** Schraven, B., Awo, M., 2012. Smallholder adaptation to climate change: dynamics and limits in Northern Ghana. *Climatic Change* 111 (3): 753-774.
- Lazarus, R.J.,** 2009. Super wicked problems and climate change: Restraining the present to liberate the future. *Cornell L. Rev.* 94: 1153-1234.
- Leach, M.,** Scoones, I., Stirling, A., 2010. Dynamic sustainabilities: Technology, environment and social justice (Pathways to sustainability series). London: Earthscan.
- Lentz, C.,** 2013. *Land, Mobility, and Belonging in West Africa*. Bloomington and Indianapolis: Indiana University Press.
- Levin, K.,** Cashore, B., Bernstein, S., Auld, G., 2012. Overcoming the tragedy of super wicked problems: constraining our future selves to ameliorate global climate change. *Policy Sciences* 45 (2): 123-152.
- Levine, S.,** Ludi, E., Jones, L., 2011. *Rethinking Support for Adaptive Capacity to Climate Change. The Role of Development Interventions. Findings from Mozambique, Uganda and Ethiopia*. London: Overseas Development Institute (ODI).
- Lévi-Strauss, C.** [1950] 1987. Introduction to the Work of Marcel Mauss, trans. Felicity Baker. London: Routledge & Kegan Paul.
- Lockwood, M.,** 2013. What Can Climate-Adaptation Policy in Sub-Saharan Africa Learn from Research on Governance and Politics? *Development Policy Review* 31 (6): 647-676.
- Loorbach, D.,** 2010. Transition Management for Sustainable Development: A Prescriptive, Complexity-Based Governance Framework. *Governance: An International Journal of Policy, Administration, and Institutions* 23 (1): 161-183.
- Lowndes, V.,** Roberts, M., 2013. *Why Institutions Matter. The New Institutionalism in Political Science*. London: Palgrave Macmillan.
- Luke, T.W.,** 2009. The Property Boundaries/Boundary Properties in Technonature Studies: "Inventing the Future", in: White, D.F., Wilbert, C. (eds.) *Technonatures*. Waterloo, ON: Wilfrid Laurier University Press, 193-214.

- Luke, T.W.**, 2005. Neither Sustainable nor Development: Reconsidering Sustainability in Development. *Sustainable Development* 13: 228-238.
- Lumsden, S.**, 2013. Deleuze and Hegel on the Limits of Self-Determined Subjectivity, in: Houle, K., Vernon, J. (eds.) *Hegel and Deleuze. Together Again for the First Time*. Evanston: Northwestern University Press, 133-151.
- Madison, G.B., Fairbairn, M.**, 1999. Introduction, in: Madison, G.B., Fairbairn, M. (eds.) *The Ethics of Postmodernity. Current Trends in Continental Thought*. Evanston: Northwestern University Press, 1-12.
- March, J.G., Olsen, J.P.**, 1984. The New Institutionalism: Organizational Factors in Political Life. *American Political Science Review* 78: 734-749.
- Mawuko-Yevugah, L.**, 2014. *Reinventing Development: Aid Reform and Technologies of Governance in Ghana*. Farnham: Ashgate.
- Maxwell, N.**, 2014. What's Wrong with Science and Technology Studies? What Needs to Be Done to Put It Right? [online]. Forthcoming in: Pisano, R. (ed.) *Physics, Astronomy and Engineering. A Bridge between Conceptual Frameworks, Society and Technologies*. Dordrecht: Springer.
- Maxwell, J.A.**, 2010. Using Numbers in Qualitative Research. *Qualitative Inquiry* 16 (6): 475-482.
- Maxwell, D., Levin, C., Armar-Klemesu, M., Ruel, M., Morris, S., Ahiadeke, C.**, 2000. *Urban livelihoods and food and nutrition security in Greater Accra, Ghana* (IFPRI Research Report No. 112). Washington, DC: International Food Policy Research Institute.
- Mbembe, A.**, 2003. Necropolitics. Transl. Libby Meintjes. *Public Culture* 15 (1): 11-40.
- McEvoy, J. and Wilder, M.**, 2012. Discourse and desalination: potential impacts of proposed climate change adaptation interventions in the Arizona–Sonora border region. *Global Environmental Change* 22 (2): 353-363.

- Ménard, C., Shirley, M.M., 2008.** Introduction, in: Ménard, C., Shirley, M.M. (eds.) *Handbook of New Institutional Economics*, p. 1-20.
- Mercer, J., 2010.** Disaster Risk Reduction Or Climate Change Adaptation: Are We Reinventing The Wheel? *Journal of International Development* 22, 247-264.
- Meyer, J.W., Rowan, B., 1977.** Institutionalized organizations: Formal structure as myth and ceremony. *American Journal of Sociology* 83 (2): 340-363.
- MOFA, 2007.** *Food and Agriculture Sector Development Policy (FASDEP II)*. Accra: Ministry of Food and Agriculture (MOFA) [online].
- Moghaddam, F.M., 2010.** Intersubjectivity, interobjectivity, and the embryonic fallacy in developmental science. *Culture & Psychology* 16 (4): 465-475.
- Moore, F.C., 2012.** Negotiating Adaptation: Norm Selection and Hybridization in International Climate Negotiations. *Global Environmental Politics* 12 (4): 30-48.
- Moore, J.W., 2015.** Nature in the limits to capital (and vice versa). *Radical Philosophy* 193: 9-19.
- Moser, S.C., 2010.** Now more than ever: the need for more societally relevant research on vulnerability and adaptation to climate change. *Applied Geography* 30 (4): 464-474.
- Moser, S.C., Ekstrom, J.A., 2010.** A framework to diagnose barriers to climate change adaptation. *PNAS* 107: 22026-22031.
- Mutua, M., 2002.** *Human Rights. A Political & Cultural Critique*. Philadelphia: University of Pennsylvania Press.
- Naab, F.Z., Dinye, R.D., Kasanga, K.R., 2013.** Urbanisation and its impact on agricultural lands in growing cities in developing countries: a case study of Tamale in Ghana. *Modern Social Science Journal* 2 (2): 256-287.
- Naamwintome, B.A., Millar, D., 2013.** Change Trends in Agricultural Extension Strategies: Who Dictates? *Scottish Journal of Arts, Social Sciences and Scientific Studies* 16 (1): 3-13.

- NADMO**, 2015. *National progress report on the implementation of the Hyogo Framework for Action (2013-2015)*. Accra: National Disaster Management Organisation (NADMO).
- Nakuja**, T., Sarpong, D.B., Kuwornu, J.K.M., Felix, A., 2012. Water storage for dry season vegetable farming as an adaptation to climate change in the upper east region of Ghana. *African Journal of Agricultural Research* 7 (2): 298-306.
- Namara**, R.E., Horowitz, L., Kolavalli, S., Kranjac-Berisavljevic, G., Davuni, B.N., Barry, B., Giordano, M., 2010. *Typology of Irrigation Systems in Ghana* (IWMI Working Paper No. 142). Colombo: International Water Management Institute (IWMI).
- Nancy**, J.-L., 1991. *The Inoperative Community*. Trans. by Peter Connor et al. Minneapolis and Oxford: University of Minnesota Press.
- Nanedo**, N.A., Prior, J.C., de Bruyn, L.L., Marshall, G.R., 2014. Capacities for irrigation water resource governance at the local level: a case study from the Upper East Region of Ghana, in: Brebbia, C.A., Bjornlund, H. (eds.) *Sustainable irrigation and drainage V: management, technologies and policies*. Southampton: WIT Press, 13-24.
- NCCAS**, 2010. *National Climate Change Adaptation Strategy*. Accra: Ghana Environmental Protection Agency and CC-DARE.
- NCCP**, 2013. *National Climate Change Policy*. Accra: Ministry of Environment, Science, Technology and Innovation (MESTI).
- NDPC**, 2013. *Guidelines for the Preparation of Medium-Term Development Plans by Ministries, Departments and Agencies 2014-2017*. Accra: National Development Planning Commission (NDPC).
- Nelson**, D.R., Finan, T.J., 2009. Praying for Drought: Persistent Vulnerability and the Politics of Patronage in Ceará, Northeast Brazil. *American Anthropologist* 111 (3): 302-316.
- Nelson**, D.R., Adger, W.N., Brown, K., 2007. Adaptation to Environmental Change: Contributions of a Resilience Framework. *Annu. Rev. Environ. Resour.* 32: 395-419.

- Nelson, R.L.**, 2011. Emptiness in the Colonial Gaze: Labor, Property, and Nature. *International Labor and Working-Class History* 79: 161-174.
- Nelson, W. et al.**, 2010. *Guidebook on Integrating Climate Change and Disaster Risk Reduction into National Development Policies and Planning in Ghana*. Accra: Environmental Protection Agency (EPA).
- Newman, J.**, 2013. Performing New Worlds? Policy, politics and creative labour in hard times. *Policy and Politics* 41 (4): 515-532.
- Nida-Rümelin, J., Rath, B., Schulenburg, J.**, 2012. *Risikoethik*. Berlin and Boston: De Gruyter.
- Nielsen, J.Ø., Reenberg, A.**, 2010. Cultural barriers to climate change adaptation: a case study from Northern Burkina Faso. *Global Environmental Change* 20 (1): 142-152.
- Nkegbe, P.K., Kuunibe, N.**, 2014. *Climate variability and household welfare in northern Ghana* (UNU-WIDER Working Paper, No. 2014/027). Helsinki: United Nations University (UNU).
- North, D.C.**, 1995. The New Institutional Economics and Third World Development, in: Harriss, J., Hunter, J., Lewis, C.M. (eds.) *The New Institutional Economics and Third World Development*. London and New York: Routledge, 17-26.
- 1990. *Institutions, Institutional Change and Economic Performance*. Cambridge: Cambridge University Press.
- Nsiah-Gyabaah, K.**, 1996. Bushfires in Ghana. *International Forest Fire News* 15: 24-29 [[online](#)].
- Nuzzo, A.**, 2012. *Memory, History, Justice in Hegel*. New York: Palgrave Macmillan.
- Nyantakyi-Frimpong, H., Bezner Kerr, R.**, 2015. A political ecology of high-input agriculture in northern Ghana. *African Geographical Review* 34 (1): 13-35.
- Obeng, P.A., Agyenim, J.B.**, 2013. Climate Change Adaptation: Institutional Approaches for Developing Countries, in: Knieling, J., Filho, W.L. (eds.) *Climate Change Governance*. Berlin and Heidelberg: Springer, 185-204.

- Obeng-Odoom, F.**, 2012. Neoliberalism and the Urban Economy in Ghana: Urban Employment, Inequality, and Poverty. *Growth and Change* 43 (1): 85-109.
- Obiri-Nyarko, F.**, 2012. Ameliorating soil acidity in Ghana: a concise review of approaches. *ARPJ Journal of Science and Technology* 2 (Special Issue): 143-153 [online].
- O'Brien, K.L.**, 2012. Global environmental change II: From adaptation to deliberate transformation. *Progress in Human Geography* 36 (5): 667-676.
- O'Brien, K.L., Wolf, J.**, 2010. A values-based approach to vulnerability and adaptation to climate change. *Wiley Interdisciplinary Reviews: Climate Change* 1 (2): 232-242.
- O'Brien, K.L., Eriksen, S., Nygaard, L., Schjolden, A.**, 2007. Why different interpretations of vulnerability matter in climate change discourses. *Climate Policy* 7: 73-88.
- Ofori-Sarpong, E.**, 2001. Impact of Climate Change on Agriculture and Farmers Coping Strategies in the Upper East Region of Ghana. *West African Journal of Applied Ecology* 2: 21-35.
- Ofose, E.A.**, 2011. *Sustainable Irrigation Development in the White Volta sub-Basin: UNESCO-IHE Ph.D. Thesis*. Leiden: CRC Press.
- Olhoff, A.**, 2015. Adaptation in the context of technology development and transfer. *Climate Policy* 15 (1): 163-169.
- Olsson, L., Jerneck, A., Thoren, H., Persson, J., O'Byrne, D.**, 2015. Why resilience is unappealing to social science: Theoretical and empirical investigations of the scientific use of resilience. *Sci. Adv.* 1, e1400217 [online].
- O'Riordan, T., Jordan, A.**, 1999. Institutions, climate change and cultural theory: towards a common analytical framework. *Global Environmental Change* 9: 81-93.
- Ostrom, E.**, 1986. An agenda for the study of institutions. *Public Choice* 48 (1): 3-25.
- Ostry, J.D., Loungani, P., Furceri, D.**, 2016. Neoliberalism: Oversold? *Finance & Development* 53 (2): 38-41.

- Owusu, K., Waylen, P., 2009.** Trends in spatio-temporal variability in annual rainfall in Ghana (1951-2000). *Weather* 64 (5): 115-120.
- Pahl-Wostl, C., 2009.** A conceptual framework for analysing adaptive capacity and multi-level learning processes in resource governance regimes. *Global Environmental Change* 19 (3): 354-365.
- Palutikof, J.P., Parry, M., Stafford Smith, M., Ash, A.J., Boulter, S.L., Waschka, M., 2013.** The past, present and future of adaptation: setting the context and naming the challenges, in: Palutikof, J.P., Boulter, S.L., Ash, A.J., Stafford Smith, M., Parry, M., Waschka, M., Guitart, D. (eds.) *Climate Adaptation Futures*. Chichester: Wiley-Blackwell, 3-29.
- Pantazidou, M., 2012.** What Next for Power Analysis? A Review of Recent Experience with the Powercube and Related Frameworks (IDS Working Paper No. 400). Brighton: Institute of Development Studies (IDS) [[online](#)].
- Park, S.E., Marshall, N.A., Jakku, E., Dowd, A.M., Howden, S.M., Mendum, E., Fleming, A., 2012.** Informing adaptation responses to climate change through theories of transformation. *Global Environmental Change* 22: 115-126.
- Parsons, T., 1937.** *The Structure of Social Action. A Study in Social Theory with Special Reference to a Group of Recent European Writers*. New York: McGraw-Hill.
- Pelig-Ba, K.B., 2011.** Levels of Agricultural Pesticides in Sediments and Irrigation Water from Tono and Veve in the Upper East of Ghana. *Journal of Environmental Protection* 2 (6): 761-768.
- Pelling, M., 2012.** Resilience and transformation, in: Pelling, M., Manuel-Navarrete, D., Redclift, M. (eds.) *Climate change and the crisis of capitalism. A chance to reclaim self, society and nature*. Oxford: Routledge, 51-65.
- 2011. *Adaptation to Climate Change: From Resilience to Transformation*. Oxford: Routledge.
- Pelling, M., O'Brien, K.L., Matyas, D., 2015.** Adaptation and transformation. *Climatic Change* 133 (1): 113-127.

- Pelling, M.,** Manuel-Navarrete, D., 2011. From resilience to transformation: the adaptive cycle in two Mexican urban centers. *Ecology and Society* 16 (2): 11 [[online](#)].
- Pellizzoni, L.,** 2014. Risk, in: Death, C. (ed.) *Critical Environmental Politics*. Abingdon and New York: Routledge, 198-207.
- Peters, B.G.,** 2012. *Institutional Theory in Political Science. The New Institutionalism*. 3rd edition. New York: Continuum.
- Poku-Boansi, M.,** Amoako, C., 2015. Dimensions of spatial inequalities in Ghanaian cities. *Journal of Geography and Regional Planning* 8 (5): 131-142.
- Power, M.,** 2014. Risk, Social Theories, and Organizations, in: Adler, P., Du Gay, P., Morgan, G., Reed, M. (eds.) *The Oxford Handbook of Sociology, Social Theory, and Organization Studies*. Oxford: Oxford University Press, 370-392.
- Preston, B.L.,** Stafford-Smith, M., 2009. *Framing vulnerability and adaptive capacity assessment: Discussion paper*. CSIRO Climate Adaptation Flagship Working paper No. 2 [[online](#)].
- Quaye, W.,** 2008. Food security situation in northern Ghana, coping strategies and related constraints. *African Journal of Agricultural Research* 3 (5): 334-342.
- Rebotier, J.,** 2012. Vulnerability conditions and risk representations in Latin-America: Framing the territorializing urban risk [sic]. *Global Environmental Change* 22 (2): 391-398.
- 2010. *Politicizing risk assessment on vulnerability conditions*. Initiative on Climate Adaptation Research and Understanding through the Social Sciences. Climate Vulnerability and Adaptation: Theories and Cases, Feb 2010, Urbana-Champaign, United States [[online](#)].
- Ribot, J.,** 2011. Vulnerability before adaptation: Toward transformative climate action. *Global Environmental Change* 21: 1160-1162.
- Rickards, L.,** Wiseman, J., Edwards, T., 2014. The problem of fit: scenario planning and climate change adaptation in the public sector. *Environment and Planning C* 32: 641-662.

- Riede, J.O.,** Posada, R., Fink, A.H., Kaspar, F., 2016. What's on the 5th IPCC Report for West Africa?, in: Yaro, J., Hesselberg, J. (eds.): *Adaptation to Climate Change and Variability in Rural West Africa*. Springer International Publishing, 7-23.
- Rittel, H.,** Webber, M., 1973. Dilemmas in a general theory of planning. *Policy Sciences* 4: 155-169.
- Rockström, J.,** Steffen, W., Noone, K., Persson, Å., Chapin III, F.S., Lambin, E., Lenton, T.M., Scheffer, M., Folke, C., Schellnhuber, H., Nykvist, B., De Wit, C.A., Hughes, T., van der Leeuw, S., Rodhe, H., Sörlin, S., Snyder, P.K., Costanza, R., Svedin, U., Falkenmark, M., Karlberg, L., Corell, R.W., Fabry, V.J., Hansen, J., Walker, B., Liverman, D., Richardson, K., Crutzen, P. and Foley, J., 2009. Planetary boundaries: exploring the safe operating space for humanity. *Ecology and Society* 14 (2): 32 [[online](#)].
- Rose, D.B.,** 2013. Anthropocene Noir. *Arena Journal* 41/42: 206-219 [[online](#)].
- Rosenau, J.N.,** 2003. *Distant Proximities. Dynamics Beyond Globalization*. Princeton: Princeton University Press.
- Rossi, B.,** 2007. Revisiting Foucauldian Approaches: Power Dynamics in Development Projects. *The Journal of Development Studies* 40 (6): 1-29.
- Rudy, A.P.,** White, D.F., 2014. Hybridity, in: Death, C. (ed.) *Critical Environmental Politics*. Abingdon and New York: Routledge, 121-132.
- Russon, J.,** 2015. Philosophy of mind, in: Baur, M. (ed.) *G.F.W. Hegel. Key Concepts*. London and New York: Routledge, 45-58.
- SADA,** 2010. *Savannah Accelerated Development Authority. A Sustainable Development Initiative for the Northern Savannah. Strategy and Work plan 2010–2030*.
- Said, E.W.,** 1994. *Culture and Imperialism*, First Edition. New York: Vintage Books.
- Sarpong, D.B.,** Anyidoho, 2012. *Climate Change and Agricultural Policy Processes in Ghana* (FAC Working Paper No. 045). Brighton: Future Agricultures Consortium [[online](#)].

- Sayer, A.**, 2012. Power, causality and normativity: a critical realist critique of Foucault. *Journal of Political Power* 5 (2): 179-194.
- Schindler, K.**, 2010. Credit for What? Informal Credit as a Coping Strategy of Market Women in Northern Ghana. *Journal of Development Studies* 46 (2): 234-253.
- Schlosberg, D.**, 2013. Theorising environmental justice: the expanding sphere of a Discourse. *Environmental Politics* 22 (1): 37-55.
- Schmidt, V.A.**, 2010. Taking ideas and discourse seriously: explaining change through discursive institutionalism as the fourth 'new institutionalism'. *European Political Science Review* 2 (1): 1-25.
- Schulz, K.**, 2011. *Linking Land and Soil to Climate Change: The UNCCD in the Context of Global Environmental Governance*. Marburg: Tec-tum.
- Schulz, K., Siriwardane, R.**, 2016. The Risk Frontier: Perceiving Social Transformations in Rural and Peri-Urban West Africa Through a Territorial Lens, in: Yaro, J., Hesselberg, J. (eds.): *Adaptation to Climate Change and Variability in Rural West Africa*. Springer International Publishing, 171-189.
- Schulz, K., Siriwardane, R.**, 2015. *Depoliticised and technocratic? Normativity and the politics of transformative adaptation* (ESG Working Paper No. 33). Amsterdam and Lund: Earth System Governance Project [[online](#)].
- Scott, W.R.**, 2008. Approaching Adulthood: The Maturing of Institutional Theory. *Theory and Society* 37 (5), Special Issue on Theorizing Institutions: Current Approaches and Debates (Oct. 2008): 427-442.
- 1995. *Institutions and organizations. Foundations for organizational science*. Thousand Oaks, CA: Sage.
- Seto, K.C., Reenberg, A., Boone, C.G., Fragkias, M., Haase, D., Langanke, T., Marcotullio, P., Munroe, D.K., Olah, B., Simon, D.**, 2012. Urban land teleconnections and sustainability. *PNAS* 109 (20): 7687-7692.

- Sharpe, B., Hodgson, A., Leicester, G., Lyon, A., Fazey, I., 2016.** Three horizons: a pathways practice for transformation. *Ecology and Society* 21 (2): 47 [online].
- Shilling, C., Mellor, P.A., 2001.** *The Sociological Ambition. Elementary Forms of Social and Moral Life*. London: Sage.
- Sietz, D., Boschutz, M., Klein, R.J.T., 2011.** Mainstreaming climate adaptation into development assistance: rationale, institutional barriers and opportunities in Mozambique. *Environmental Science & Policy* 14 (4): 493-502.
- Singer, P., 2013 [1990].** All Animals Are Equal, in: Shafer-Landau, R. (ed.) *Ethical Theory: An Anthology*, Second Edition. Chichester: Wiley, 361-371.
- Sinha, C., 2009.** Objects in a storied world: Materiality, normativity, narrativity. *Journal of Consciousness Studies* 16 (6-8): 167-190.
- Sinnerbrink, R.S., 2008.** The Hegelian 'Night of the World': Žižek on Subjectivity, Negativity, and Universality. *International Journal of Žižek Studies* 2 (2) (Special Issue on Žižek and Hegel) [online].
- Solomon, M., 2007.** Situated Cognition, in: Thagard, P. (ed.) *Handbook of the Philosophy of Science. Philosophy of Psychology and Cognitive Science*. Amsterdam: Elsevier B.V., 413-428.
- Sorensen, A., 2015.** Taking path dependence seriously: an historical institutionalist research agenda in planning history. *Planning Perspectives* 30 (1): 17-38.
- Sova, C.A., Thornton, T.F., Zougmore, R., Helfgott, A., Chaudhury, A.S., 2016.** Power and influence mapping in Ghana's agricultural adaptation policy regime. *Climate and Development* (ahead of print): 1-17. doi: 10.1080/17565529.2016.1154450.
- Sow, P., Adaawen, S.A., Scheffran, J., 2014.** Migration, social demands and environmental change amongst the Frafra of Northern Ghana and the Biali in Northern Benin. *Sustainability* 6: 375-398.
- Speight, A., 2008.** *The Philosophy of Hegel*. Stocksfield, UK: Acumen.
- Stanturf, J.A., Warren, M.L., Charnley, S., Polasky, S.C., Goodrick, S.L., Armah, F., Nyako, Y.A., 2011.** *Ghana climate change vulnerability*

- and adaptation assessment*. United States Agency for International Development (USAID) [[online](#)].
- Stengers, I.**, 2000. *The Invention of Modern Science*. Minneapolis: University of Minnesota Press.
- Stephan, B.**, Rothe, D., Methmann, C., 2014. Third Side of the Coin: Hegemony and Governmentality in Global Climate Politics, in: Stripple, J., Bulkeley, H. (eds.) *Governing the Climate. New Approaches to Rationality, Power and Politics*. Cambridge: Cambridge University Press, 59-76.
- Stern, N.**, 2006. What is the economics of climate change? *World Economics* 7 (2): 1-10 [[online](#)].
- Stirling, A.**, 2014. *Emancipating Transformations: From controlling 'the transition' to culturing plural radical progress* (STEPS Working Paper 64). Brighton: STEPS Centre [[online](#)].
- Storbjörk, S.**, 2010. 'It takes more to get a ship to change course': barriers for organizational learning and local climate adaptation in Sweden. *Journal of Environmental Policy & Planning* 12 (3): 235-254.
- Strydom, P.**, 2013. *Normativity and Transgression: A Brief Conceptual Analysis*. Background paper for the Theory and Philosophy Summer School, Blackwater Castle, Castletownroche (30 April 2013) [[online](#)].
- 2011. *Contemporary Critical Theory and Methodology*. London and New York: Routledge.
- Subrahmanian, R.**, 2007. Making sense of gender in shifting institutional contexts: some reflections on gender mainstreaming, in: Cornwall, A., Harrison, E., Whitehead, A. (eds.) *Feminisms in development: contradictions, contestations and challenges*. London: Zed Books, 112-121.
- Susen, S.**, 2009. Between emancipation and domination: Habermasian reflections on the empowerment and disempowerment of the human subject. *Pli: The Warwick Journal of Philosophy* 20, 80-110 [[online](#)].

- Swanepoel, N.**, 2008. View from the village: changing settlement patterns in Sisalaland, northern Ghana. *The International Journal of African Historical Studies* 41(1), 1-27.
- Swyngedouw, E.**, 2010. Apocalypse Forever? Post-political Populism and the Spectre of Climate Change. *Theory, Culture & Society* 27 (2-3): 213-232.
- Sztybel, D.**, 2009. Normative Sociology: the Intuitionist Crisis and Animals as Absent Referents. *Journal for Critical Animal Studies* 7 (2): 83-127.
- Tachie-Obeng, E.**, Gyasi, E., Adiku, S., Abekoe, M., Ziervogel, G., 2010. Farmers' adaptation measures in scenarios of climate change for maize production in semi-arid zones of Ghana (2nd International Conference: climate sustainability and Development in Semi-arid Regions, August 2010) [online].
- Tanner, T.**, Lewis, D., Wrathall, D., Bronen, R., Cradock-Henry, N., Huq, S., Lawless, C., Nawrotzki, R., Prasad, V., Rahman, Md. A., Alaniz, R., King, K., McNamara, K., Nadiruzzaman, Md., Herly-Shepard, S. and Thomalla, F., 2015. Livelihood resilience in the face of climate change. *Nature Climate Change* 5: 23-26.
- Teye, J.K.**, Bawakyillenuo, S., Yaro, A.J., 2015. Local farmers' experiences and perceptions of climate change in the northern savannah zone of Ghana. *International Journal of Climate Change Strategies and Management* 7(3): 327-347.
- Thomalla, F.**, Downing, T., Spanger-Siegfried, E., Han, G., Rockström, J., 2006. Reducing hazard vulnerability: towards a common approach between disaster risk reduction and climate adaptation. *Disasters* 30 (1): 39-48.
- Thywissen, K.**, 2006. *Components of Risk. A Comparative Glossary* (SOURCE Publication Series No. 2). Bonn: United Nations University (UNU-EHS).
- Tonah, S.**, 2008. Chiefs, earth priests and the state: Irrigation agriculture, competing institutions and the transformation of land tenure arrangements in Northeastern Ghana, in: Ubink, J.M., Kojo,

- S.A. (eds.) *Contesting Land and Custom in Ghana. State, Chief and the Citizen*. Leiden: Leiden University Press, 113-130.
- Torpey, V.**, 2012. *Politics of Environmental Management and Policy: A Case Study of Ghana*, Doctoral dissertation, Ottawa.
- Turner II, B.L.**, 2010. Vulnerability and resilience: Coalescing or paralleling approaches for sustainability science? *Global Environmental Change* 20: 570-576.
- Ullrich, P., Keller, R.**, 2014. Comparing Discourse Between Cultures. A Discursive Approach to Movement Knowledge, in: Baumgarten, B., Daphi, P., Ullrich, P. (eds.) *Conceptualizing Culture in Social Movement Research*. London: Palgrave Macmillan, 113-139.
- UNDP**, 2012. *Mapping conflict zones in Ghana*. Draft Report, n.p. [[online](#)].
- UNEP**, 2013. *Africa Adaptation Gap Technical Report: Climate-change impacts, adaptation challenges and costs for Africa* (report prepared by UNEP-ROA, AMCEN and Climate Analytics) [[online](#)].
- UNFCCC**, 1992. *United Nations Framework Convention on Climate Change*. Text of the Convention (English) [[online](#)].
- UNISDR**, 2009. *UNISDR Terminology on Disaster Risk Reduction*. Geneva: United Nations International Strategy for Disaster Reduction [[online](#)].
- University of Oslo**, 2013. *Proceedings of Transformation in a Changing Climate*, 19-21 June 2013, Oslo, Norway. University of Oslo [[online](#)].
- Van Aalst, M.K., Cannon, T., Burton, I.**, 2008. Community level adaptation to climate change: The potential role of participatory community risk assessment. *Global Environmental Change* 18: 165-179.
- Vanderpuye-Orgle, J., Barrett, C.B.**, 2009. Risk Management and Social Visibility in Ghana. *African Development Review* 21: 5-35.
- Venot, J.P., Andreini, M., Pinkstaff, C.B.**, 2011. Planning and corrupting water resources development: The case of small reservoirs in Ghana. *Water Alternatives* 4 (3): 399-423.
- Vermeulen, S.J., Challinor, A.J., Thornton, P.K., Campbell, B.M., Eriyagama, N., Vervoort, J.M., Kinyangi, J., Jarvis, A., Läderach, P., Ramirez-Villegas, J., Nicklin, K.J., Hawkins, E., Smith, D.R.**, 2013.

- Addressing uncertainty in adaptation planning for agriculture. *PNAS* 110 (21): 8357-8362.
- Walsh, C.**, 2010. Development as Buen Vivir: Institutional arrangements and (de)colonial entanglements. *Development* 53 (1): 15-21.
- WASCAL**, 2012. *Research Proposal – Core Research Program*. Bonn: Center for Development Research.
- WBGU**, 2011. *World in Transition. A Social Contract for Sustainability* (Flagship Report). Berlin: German Advisory Council on Global Change.
- Weber, M.** [1930] 2005. *The Protestant Ethic and the Spirit of Capitalism*. London and New York: Routledge (Orig. Ger. pub. 1904-5, 1st English transl. 1930).
- 1978. *Economy and society*. Berkeley: University of California Press.
- Weisser, F., Bollig, M., Doevenspeck, M., Müller-Mahn, D.**, 2014. Translating the 'adaptation to climate change' paradigm: the politics of a travelling idea in Africa. *The Geographical Journal* 180 (2): 111-119.
- Weldeab, S., Lea, D.W., Schneider, R.R., Andersen, N.**, 2007. 155.000 years of West African monsoon and ocean thermal evolution. *Science* 316 (5829): 1303-1307.
- Westley, F., Olsson, P., Folke, C., Homer-Dixon, T., Vredenburg, H., Loorbach, D., Thompson, J., Nilsson, M., Lambin, E., Sendzimir, J., Banerjee, B., Galaz, V., van der Leeuw, S.**, 2011. Tipping toward sustainability: Emerging pathways of transformation. *Ambio* 40 (7): 762-780.
- White, D.F., Wilbert, C.**, 2009. *Technonatures*. Waterloo, ON: Wilfrid Laurier University Press.
- White, S.K.**, 2000. *Sustaining Affirmation: The Strengths of Weak Ontology in Political Theory*. Princeton: Princeton University Press.
- Wilkinson, A., Kupers, R.**, 2014. *The Essence of Scenarios. Learning from the Shell Experience*. Amsterdam: Amsterdam University Press.

- Wise**, R.M., Fazey, I., Stafford Smith, M., Park, S.E., Eakin, H.C., Archer Van Garderen, E.R.M., Campbell, B., 2014. Reconceptualising adaptation to climate change as part of pathways of change and response. *Global Environmental Change* 28, 325-336.
- Wisner**, B., Blaikie, P., Cannon, T., Davis, I., 1994. *At risk: natural hazards, people's vulnerability and disasters*, 1st ed., London and New York: Routledge.
- World Bank**, 2015a. *Rising through Cities in Ghana. Ghana Urbanization Review Overview Report*. Washington, DC: The International Bank for Reconstruction and Development/The World Bank.
- 2015b. *Republic of Ghana: Ghana Work program (FY15). Poverty and Inequality Profile*. Washington, DC: The International Bank for Reconstruction and Development/The World Bank.
- 2011. *Ghana Climate Risk and Adaptation Country Profile: Vulnerability, Risk Reduction and Adaptation to Climate Change*. Washington, DC: The World Bank.
- 2004. *Ghana - Urban Water Project*. Washington, DC: The World Bank [[online](#)].
- World Economic Forum**, 2016. *The Global Risks Report 2016*. 11th Edition. Geneva [[online](#)].
- 2012. *The Great Transformation: Shaping New Models*. Davos-Klosters [[online](#)].
- Würtenberger**, L., Bunzeck, I.G., van Tilburg, X., 2011. *Initiatives related to climate change in Ghana. Towards coordinating efforts*. Policy Studies Report Number ECN-E-11-010. Energy research Centre for the Netherlands (ECN).
- Yaro**, J.A., 2013a. The perception of and adaptation to climate variability/ change in Ghana by small-scale and commercial farmers. *Regional Environmental Change* 13: 1259-1272.
- 2013b. Neoliberal globalization and evolving local traditional institutions: implications for access to resources in rural northern Ghana. *Review of African Political Economy* 40 (137): 410-427.

- Yaro, J.A.**, 2010. *The Social Dimensions of Adaptation to Climate Change in Ghana* (World Bank Discussion Paper No. 15). Washington, DC: The World Bank.
- 2006. Is deagrarianisation real ? A study of livelihood activities in rural northern Ghana. *Journal of Modern African Studies* 44 (1): 125-156.
- Yaro, J.A., Teye, J.K., Bawakyillenuo, S.**, 2016. An Assessment of Determinants of Adaptive Capacity to Climate Change/Variability in the Rural Savannah of Ghana, in: Yaro, J., Hesselberg, J. (eds.): *Adaptation to Climate Change and Variability in Rural West Africa*. Springer International Publishing, 59-82.
- Yiran, G.A.B.**, 2016. Mapping Social Capital for Adaptation to Climatic Variability in a Savannah Ecosystem of Ghana, in: Yaro, J., Hesselberg, J. (eds.): *Adaptation to Climate Change and Variability in Rural West Africa*. Springer International Publishing, 215-237.
- Young, O.R., King, L.A., Schroeder, H.** (eds.), 2008. *Institutions and Environmental Change. Principal Findings, Applications, and Research Frontiers*. Cambridge, MA and London, UK: MIT Press.
- Zepke, S.**, 2005. *Art as Abstract Machine: Ontology and Aesthetics in Deleuze and Guattari*. New York: Routledge.
- Žižek, S.**, 2014. *Absolute Recoil: Towards a New Foundation of Dialectical Materialism*. London and New York: Verso.
- 2008. *The Ticklish Subject. The Absent Center of Political Ontology*, Second Edition. London and New York: Verso.
- 2005. Against Human Rights. *New Left Review* 34: 115-131.
- Zlomislić, M.**, 2007. *Jacques Derrida's Aporetic Ethics*. Plymouth, UK: Lexington Books.
- Zucker, L.G.**, 1977. The role of institutionalization in cultural persistence. *American Sociological Review* 42: 726-743.

ANNEXES

Annex 1: List of Expert Interviews and Organizations (n=15)

ORGANIZATION	LOCATION
01) United Nations Development Programme (Group discussion with 4 participants)	Accra
02) Friends of the Earth Ghana & National Climate Change Committee	Accra
03) United Nations University (UNU-INRA)	Accra
04) CARE International, Ghana	Accra
05) Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ) GmbH	Accra
06) University of Ghana, Legon (Institute for Environment & Sanitation Studies)	Accra
07) University of Ghana, Legon (Department of Soil Science)	Accra
08) Ministry of Food and Agriculture (MOFA)	Bolgatanga
09) National Disaster Management Organization (NADMO)	Bolgatanga
10) Water Resources Commission of Ghana (WRC)	Bolgatanga
11) Ghana Meteorological Agency (GMet)	Bolgatanga
12) Environmental Protection Agency (EPA)	Bolgatanga
13) United States Agency for International Development (USAID)	Bolgatanga
14) Irrigation Company of the Upper Region Ltd. (ICOUR)	Vea
15) District Planning and Coordinating Unit (DPCU)	Bongo

Annex 2: Ethics Principles for Research

The ethics principles that inform the Code of Conduct adhered to by the principle investigator (Karsten A. Schulz) and research staff during field work are as follows:

Beneficence

As researchers we strive to ensure that our work should make a positive contribution to the welfare of those affected by it.

Non-intrusion and non-maleficence

The study aims to ensure that the research tasks undertaken within the context of the project, and this study in particular, do not cause harm to any segments or sectors of society and to its research participants.

Justice and equity

Justice refers to the obligations to treat all persons fairly and equitably. Equity in particular, necessitates that no segment of the population is unduly burdened with harms of research or is denied the benefits of the knowledge that is generated from it. All foreseeable benefits and risks associated with the research endeavors have been well assessed in advance. The benefits derived from the research findings should be equitably distributed throughout society.

Autonomy of all participants

Where applicable, the research respects and protects the rights and dignity of all participants. Many aspects of the study involve primary data collection, usually in the form of interviews, surveys and other findings derived from workshops and group discussions. The principle investigator is fully compliant with all national legal and regulatory procedures and requirements regarding the collection, storage,

handling, processing and analysis of data. In this light, the study seeks to conform to the highest standards of:

(a) *Veracity*

Participants in sample surveys and related data collection exercises are given full and accurate information with regard to issues such as the background, nature, purpose, funders and outputs of the research.

(b) *Prior informed consent*

Participants in interviews, sample surveys and related data collection exercises are given sufficient details on the research in question as to allow them to make an informed decision to participate or withdraw. Similarly, no photos depicting people were taken without their prior consent.

(c) *Protection of vulnerable groups*

No persons under the age of 18 will be involved in the research process. Meanwhile, all researchers involved in data collection for this study will be conscious of their obligations to safeguard the interests of vulnerable groups, and those who have been socio-historically marginalized, and would be involved in the research process. They may involve women's groups, persons of diverse gendered orientations, members of indigenous and minority ethnic communities, persons with disabilities, and or other sub-groups of the population. Moreover, participants in sample surveys and related data collection exercises have the right not only to agree to participate in the research but also to decide on which information to provide as part of the research, and to withdraw from the research process at any point in time.

(d) *Anonymity and confidentiality*

The information provided by participants is treated as confidential and used for research purposes only. Micro-level information will not be disclosed in any fashion to third parties that would allow data to be

associated with an identifiable individual, unless participants have given their informed consent when being recruited into the research.

(e) *Minimizing foreseeable risk*

Researchers involved in this study will comply by any standards or requirements necessitated by the relevant funding bodies and governmental agencies of the countries in which they work. All research material, including official fieldwork reports submitted to WASCAL project members, research participants, collaborating networks, engaged stakeholders and the public shall adhere to the core ethics principles outlined in this section.

(f) *Outreach and communication*

The principle investigator is committed to putting the results of his research into the public domain with a view to transparency, peer review and any necessary procedures that warrant its scrutiny. Yet, primary anonymized data will be made available only on request of the related funding bodies for validation or verification. Only published results will be freely accessible within the public domain.

Annex 3: Cropping Targets & Output for the Veia Irrigation Project (2001-2012)

Season	Crop	Target (ha.)	Monitored (ha.)	Yield (t/ha.)	Production (t)
2001/2002 Dry	Rice	300	165	5.5	908
	Tomato	200	198	14.1	2912
	Cowpea	5	3	0.5	1.5
	Onion	10	5	7.6	38
	'Pepper'	10	2	0.3	0.6
		525	373		
2002 Wet	Rice	300	91	4.6	419
	Groundnut	200	83	0.8	66
	Sorghum/Millet	200	213	0.7/0.7	149
	Cowpea	20	2.4	0.5	1
		720	395		
2002/2003 Dry	Rice	300	167	4.5	752
	Tomato	200	2.5	1.7	349
	Onion	5	0	-	-
	'Pepper'	5	5	0.3	2
		510	377		
2003 Wet	Rice	300	100	4.8	480
	Sorghum/Millet	200	225	0.7/0.7	158
	Groundnut	150	75	0.8	60
	Maize	0	19	1.3	25
		650	419		
2003/2004 Dry	Rice	300	70	4.8	336
	Tomato	200	54	10.7	578
	Onion	5	2	10	20
		505	126		
2004 Wet	Rice	300	57	3.7	211
	Maize	10	0	-	-
	Groundnut	200	112	0.8	90
	Sorghum/Millet	200	209	0.7/0.7	146
		710	378		
2004/2005 Dry	Rice	100	66	4.2	277
	Tomato	50	45	9.8	441
		150	111		

Season	Crop	Target (ha.)	Monitored (ha.)	Yield (t/ha.)	Production (t)
2005 Wet	Rice	300	85	3.9	332
	Maize	10	5	1.3	7
	Groundnut	200	85	0.8	68
	Sorghum/Millet	200	313	0.7/0.7	438
		710	488		
2005/2006 Dry	Rice	400	78	6.6	525
	Tomato	300	64	16.9	1082
	Onion	10	10	3.0	30
		710	152		
2006 Wet	Rice	200	131	3.9	511
	Groundnut	200	106	0.8	85
	Sorghum/Millet	200	228	0.7/0.7	320
	Maize	0	6	1.3	8
		600	471		
2006/2007 Dry	Rice	200	134.18	4.9	657
	Tomato	200	205.46	10.4	2137
	Soybean	10	0.44	-	-
		410	340.08		
2007 Wet	Rice	200	93.38	3.7	34.6
	Groundnut	200	82.38	0.8	66.0
	Sorghum/Millet	100	165.00	0.7/0.7	116/116
	Maize	10	7.81	1.3	10
		510	349.01		
2007/2008 Dry	Rice	200	136.02	5.6	762
	Tomato	200	65.63	12.8	840
	Onion	0	1.31	10.5	13.8
		400	202.96		
2008 Wet	Rice	200	66.38	5.4	358
	Sorghum/Millet	100	138.04	0.7/0.7	97/97
	Groundnut	200	19.96	0.8	16
	Maize	10	3.32	1.3	4.3
	Others	0	0.76	N/A	-
		510	228.46		
2008/2009 Dry	Rice	200	111.49	4.2	468
	Tomato	200	47.65	7.0	334
	Others	0	7.5	-	-
		400	166.62		

Season	Crop	Target (ha.)	Monitored (ha.)	Yield (t/ha.)	Production (t)
2009 Wet	Rice	200	100.40	3.5	351
	Groundnut	200	22.40	0.8	18
	Sorghum/Millet	100	181.00	0.7/0.7	127/127
	Maize	10	4.60	1.3	6
		510	208.00		
2009/2010 Dry	Rice	200	75.28	5.1	384
	Tomato	200	31.84	1.3	41.4
	Others	0	16.74	-	-
		400	123.86		
2010 Wet	Rice	150	80.59	3.6	290
	Groundnut	200	13.80	0.8	11
	Sorghum/Millet	200	115.55	0.7/0.7	81/81
	Others	0	12.40	-	-
		550	222.34		
2010/2011 Dry	Rice	200	47.36	3.9	425
	Tomato	200	19.76	8.7	173
	Others	0	3.6	N/A	-
		400	70.72		
2011 Wet	Rice	150	89.70	4.5	404
	Groundnut	100	22.90	0.8	18
	Sorghum/Millet	200	233.26	0.7/0.7	163/163
	Maize	20	10.68	1.3	15
		470	356.54		
2011/2012 Dry	Rice	200	46.42	4.10	1893
	Tomato	200	29.38	10.50	308
	Others	20	10.58	-	-
		420	86.38		
2012 wet	Rice	100	64.43	N/A	N/A
	Groundnut	50	19.21		
	Sorghum/Millet	150	135.52		
	Maize	30	8.25		
		330	227.11		

Source: ICOUR, Vea.