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Impact, Diffusion and Scaling-Up of a Comprehensive Land-Use Planning Approach in the Philippines: From Development Cooperation to National Policies

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IMPACT, DIFFUSION AND SCALING-UP OF A COMPREHENSIVE LAND-USE PLANNING APPROACH IN THE PHILIPPINES

From Development Cooperation to National Policies

2018

DEval
GERMAN INSTITUTE FOR DEVELOPMENT EVALUATION

This evaluation report investigates the impact of ten years of comprehensive land-use planning in the Philippines. Characterized by fundamental developmental challenges associated with scarce land resources, environmental degradation, natural hazards and persistent poverty, land-use planning plays a crucial role in finding answers to these pressing challenges.

The impact evaluation assesses a technical approach to enhanced land-use planning and capacity development from community to national level, supporting decentralized planning, natural resource governance, and resilience to natural hazards and climate change. The so-called SIMPLE (Sustainable Integrated Management and Planning for Local Government Ecosystems) approach by the Philippine-German cooperation, managed by the Deutsche Gesellschaft für internationale Zusammenarbeit (GIZ), was implemented in two regions of the Visayas. The ambitious intervention operated in a challenging environment with multiple stakeholders, overlapping mandates, and imprecise legal frameworks. In cooperation with GIZ, the Housing and Land Use Regulatory Board (HLURB) rolled out the related enhanced Comprehensive Land Use Planning (eCLUP) guidelines nationwide.

Based on a mixed-methods and quasi-experimental design, the evaluation generates relevant findings for the improvement of land-use planning and local governance interventions, for sustainable natural resource management, disaster risk management, and for welfare improvements of communities and beneficiaries. It shows relevant factors for the successful implementation. The report draws important lessons for local planning and the national framework, and suggests solutions to the fundamental gap between planning and plan implementation, improved innovation diffusion and efficient processes, effective community participation, and public accountability.

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EXECUTIVE SUMMARY

Land is a vitally important resource. It is the foundation for socio-economic development and the functioning of local ecosystems. In order to secure the fair participation of all stakeholders and to ensure sustainable use, comprehensive land management beyond self-regulation is needed. Land-use planning is the technical instrument that facilitates an inclusive and transparent allocation of land, the steering of land use and natural resources. Its goal is to ensure the harmonization of potentially conflicting demands made on land.

The Philippine case demonstrates the vital importance of a comprehensive approach to land-use planning and development. The challenges that the Philippines are facing are relevant to many developing countries, including an exposure to natural hazards and climate change, scarcity of land and other resources, and endangered ecosystems. The relevance of comprehensive land-use planning is further underlined by challenging socio-economic conditions, such as high population growth, unequal economic development and poverty, and a modernizing as well as decentralized public administration. Such physical and socio-economic conditions require a holistic and broader planning perspective across sectors, jurisdictions and ecosystems. Land-use planning thus shapes rural and urban development, supports adaptation to climate change and environmental conservation, and helps to ensure the sustainable use of natural resources.

This evaluation report presents findings of a rigorous impact evaluation, following a theory-based approach and applying a mixed-methods design. It assesses a technical approach on enhanced land-use planning in the Philippines implemented over ten years. The intervention has been implemented by the Philippine–German Cooperation and the Philippine planning authority, the Housing and Land Use Regulatory Board (HLURB). The Philippine–German Cooperation developed and implemented this multi-level and multi-stakeholder technical approach in the domain of the Environment and Rural Development (EnRD) programme, which was managed by the Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ).

In its design and implementation, the intervention can be considered a typical example of technical development cooperation that links systemic capacity development on multiple levels with the achievement of long-term and development goals. The intervention aimed to improve processes and structures for land-use and development planning in the Philippines by capacitating and training local land-use planning officers, in order to contribute to long-term improvements in various land-use related areas. It has the potential to contribute to goals of current development agendas, such as the Agenda 2030 for Sustainable Development, eradication of poverty, environmental protection, and improvement of welfare and (rural) livelihoods. Evaluating this intervention provides valuable information for development cooperation in general, particularly for interventions supporting good (decentralized) governance and local ownership, disaster risk management, and climate change adaptation and mitigation. Our findings are also pertinent to the strategic question of how to build local ownership and scale up good practices from local to national level.

The enhanced land-use planning approach consists of a bundle of measures and activities. These include training schemes, technical assistance, and the development and implementation of processes and instruments for comprehensive and participatory land-use planning. The initial intervention, called “SIMPLE” (Sustainable Integrated Management and Planning for Local Government Ecosystems), started in 2006. In intensive cooperation with stakeholders in the Philippine planning and land-use administration, the Philippine–German Cooperation developed and implemented this enhanced and participatory land-use planning approach in selected municipalities in the regions Eastern Visayas (region 8) and Western Visayas (region 6). In cooperation with the HLURB, and in the course of updating and developing the enhanced Comprehensive Land-Use Planning (eCLUP) guidebooks, the stakeholders carried out a process to adopt the core aspects of the SIMPLE approach as a national policy on enhanced land-use planning. At the close of the EnRD programme at the end of 2015, the national eCLUP guidelines, which had taken on substantial components of the previous locally tested SIMPLE approach, were officially launched.

In an international comparison carried out by DEval of similar land-use planning and management interventions implemented by GIZ, SIMPLE can be considered a typical “mid-level” development intervention in

terms of technical and administrative complexity. The activities implemented are similar to other interventions in other country contexts that have established structures of planning administration but require technical sophistication in planning processes as well as improvements in inter-agency coordination. Hence, the results of this evaluation can be transferred to many other intervention contexts.

This evaluation is concerned with the main question: what effects of ten years of enhanced land-use planning efforts can be identified at household, barangay[1], and municipal level?

We follow the evaluation criteria by the Development Assistance Committee (DAC) of the Organisation for Economic Co-Operation and Development (OECD). The evaluation prioritized the assessment of four main evaluation objectives:

- The first objective follows the OECD-DAC criterion *relevance*, measuring whether enhanced land-use planning is consistent with current national and global development agendas (and through them with the priorities of donor and partner country); this includes an assessment of the intervention's contribution to the Sustainable Development Goals (SDGs);
- the second follows the criterion *effectiveness*: whether the intervention improved land-use planning and planning techniques and thus achieved its objectives;
- the third assesses its *impact*, measuring the medium- to long-term effects, including impacts of the intervention on environmental and socio-economic indicators; and
- the fourth addresses the *sustainability* of the intervention by assessing the continuity of intervention benefits, analysing, in particular, the scaling-up of the intervention, innovation and policy diffusion, and drawing lessons for the replication of the approach.

Objectives referring to the criterion *efficiency* were not addressed in this evaluation. The focus of the evaluation is the impact assessment of a technical approach on enhanced land-use planning that involved several stakeholders and for which separate cost data were not available.

The core of this evaluation is a rigorous impact assessment, in order to measure and quantify effects in five impact fields, ranging from improvements to administrative structures and conditions in planning administrations, the handling of natural resources, measures and activities in Disaster Risk Management (DRM) and functioning of local governance, to welfare improvements for the affected population. The impact fields are based on a comprehensive reconstruction of the Theory of Change (ToC) of the intervention.

This methodological approach to rigorously measuring the effects of a complex intervention to improve land-use planning is, so far, unique, as comprehensive impact assessments of planning tools and land-use policy are rare. The evaluation thus contributes to the debate on the effectiveness of land-use planning policy and its technical approaches, and also shows that rigorous impact evaluation of complex technical assistance interventions is indeed feasible in the development context. Following evaluation standards, this evaluation combines methodological rigour and accuracy, transparency and scientific accountability with utility, fairness, independence, and integrity.

For this evaluation, we apply a theory-based approach and a mixed-methods design: we use panel data from a multi-level survey, qualitative interviews and focus group discussions, literature review, document analysis of land-use planning documents, and geographic data and information. The methodological design is based on a preliminary study on the first round of data collection by Garcia Schustereder et al., published in 2016. The panel data comprise 3,000 households, spread across 300 barangays in 100 municipalities, with and without GIZ assistance, across eleven provinces in the Visayas regions, measured in two points of time (2012 and 2016). The impact assessment method is based on a quasi-experimental design, in which we apply a propensity score matching procedure with lagged outcome variable. With this procedure, we identify "statistical twins", based on several dozen characteristics of the municipalities, barangays, and households.

[1] *Barangay is an official administrative unit below municipalities and cities. It is used in accordance with the term village. A barangay is headed by the barangay captain (village head).*

This enables us to attribute effects to the intervention and to rigorously assess the effects of a complex land-use planning intervention. We assessed effects on numerous indicators at household, barangay and municipal level in five impact fields.

We draw several conclusions with regard to the OECD-DAC evaluation criteria *relevance* and *effectiveness*:

The intervention shows a high degree of *relevance*. For this criterion, we assessed the consistency of the intervention or its outcomes with national and global development agendas. With regard to the global agenda on sustainable development, we find significant potential for enhanced land-use planning interventions to contribute to the overarching goals of the SDGs. However, at this stage, we rarely find measurable effects contributing to particular goals. With regard to national agendas, enhanced land-use planning substantially contributes to the goals of the Philippine Development Plan 2012–2017 and it is also partly reflected in several sectoral strategies of the German development cooperation. Our results affirm the relevance of the intervention in terms of aiming to improve basic necessities of the affected population in line with overarching development goals. It can be considered a precondition for the implementation of other rural development interventions.

In terms of the *effectiveness* of the intervention, results suggest that enhanced land-use planning was moderately effective. It improved land-use planning and techniques as well as planning capacities in intervention municipalities. Municipalities receiving the intervention show higher plan quality, greater comprehensiveness, and we find a positive effect on plan approval. Furthermore, it contributed to a more frequent implementation of mandatory planning elements. In contrast, little effect is visible on soft planning elements such as stronger participation, plan integration (between barangay and municipal level) as well as in addressing structural problems concerning understaffed municipal planning administrations and insufficient enforcement and implementation of plans and planning goals. The evaluation also highlights that other rural development interventions (such as other EnRD project components) contribute to positive effects of enhanced land-use planning. Vice versa, it is important to note that functioning land-use planning is also an important success factor for other rural development measures. Hence, land-use planning and other rural development interventions are interdependent.

Our assessment of the OECD-DAC evaluation criteria *impact* and *sustainability* leads to following conclusions:

We identify the following limited to moderate impacts in the fields “Sustainable Natural Resource Management”, “Disaster Risk Management”, “Local Governance”, and “Welfare”:

With regard to *Sustainable Natural Resource Management*, the intervention was able to increase the number of protected areas (but not marine sanctuaries) and of conservation and livelihood projects such as tree planting. There is no measurable effect on actual change of land use reported by households, nor on household awareness related to topics of environmental conservation.

In the impact field of *Disaster Risk Management (DRM)*, we identify that municipalities receiving the intervention show strengthened capacities to engage in DRM, especially with regard to technical and planning measures. At barangay and household level, positive effects such as greater disaster awareness or more proactive disaster management strategies are restricted to municipalities in region 8 that started receiving the intervention only after 2012.

Considering *Local Governance,* we find only limited effects on the functioning and public perception of local governance, and most of them were negative. Trust, as well as the perception of local government functioning among households, diminished, given that the underlying power structures found in many municipalities were not addressed by the intervention. This influenced, for instance, the finalization of political parts of the Comprehensive Land-Use Plan (CLUP) such as the zoning ordinance. It should be noted that such underlying issues were beyond the goals and scope of the initial intervention. Moreover, the analysis further revealed a significant increase in the number of conflicts; further inquiry showed that the intervention led to im-

proved visibility of previously hidden or latent conflicts. The intervention contributed to a more active conflict handling by municipalities and barangays. In terms of the provision of public services, we predominantly identify positive effects.

Lastly, and with regard to household *Welfare*, we find almost no attributable effects of the intervention. This is not surprising, as the impact field of welfare is located at the end of the causal chain. Given the timing of the intervention and evaluation, effects have to be expected to be long term, and will only materialize if the existing interruptions of the causal chain are addressed.

There are several *cross-cutting* results from the impact assessment:

- First, the intensity of impacts decreases from the municipal level down to the household level, and thus hints at issues of missing implementation, lacking information, and at shortcomings in community participation. Hence, a number of anticipated impacts have not (yet) materialized. This was particularly the case at household and barangay level.
- Second, as a cross-cutting finding through all impact fields, we find that more training leads to more and stronger effects.
- Third, long-term support shows more positive effects, although this finding is less conclusive.
- Fourth, we find stronger effects if there are also other supporting interventions, such as other components of the EnRD programme. This is particularly the case for municipal-level indicators on land-use planning and sustainable natural resource governance.
- Fifth, as cross-cutting factors that counteract effects, we identify weak enforcement and implementation of plans, insufficient information and participation of population, as well as insufficient resources at municipal level – factors that are the responsibility of the Philippine planning system.

Our assessment attributes a high degree of *sustainability* to the intervention, defined here as continuity of the benefits of the development intervention.[2] Central elements of the intervention have been taken up and integrated into national land-use planning (eCLUP) policy. Other positive signs for the continuity of benefits are the successful diffusion of policies and innovations. Improved CLUP development continues, including an increased number of capacitated planning staff in municipalities and provinces, and many institutional and technical advancements are now in place, such as evidence-based planning along a specified process, technical writing, and the use of geographic information systems. Some of the improvements by the intervention were even taken up by other, non-participating municipalities through informal knowledge dissemination and sharing. However, we also see that participatory planning has received a lower priority in the eCLUP guidelines (compared to the SIMPLE intervention), as has the inclusion of barangay priorities. As threats to the continuity of benefits, we identify current issues of land titles, land-use rights, and highly concentrated land ownership. For different reasons, neither SIMPLE nor eCLUP aimed at addressing these structural issues in enhanced land-use planning.

Our results underline that, despite encouraging results, several challenges remain. Long-term effects of the intervention are dependent upon the continuation and intensity of developed training schemes, the degree of the future implementation of public participation, improvements to ensure public accountability, and the future resource situation among provincial and municipal planning administrations. In these fields, we identify weaknesses. Bottlenecks concerning personnel constraints might hamper long-term effects, due to shortcomings in implementation and monitoring. Furthermore, the sustainability and continuing effect of the intervention, is crucially dependent upon *supporting institutional factors* such as political support in affected municipalities and provinces, and ultimately upon a comprehensive harmonization of land-use pol-

[2] *We covered the broader aspects of a contemporary understanding of sustainability (in line with Agenda 2030), including the social, economic, ecological, and political dimensions of sustainable development in the analysis of the intervention's contribution to the sustainable development goals in the OECD-DAC criterion relevance. This is in line with the recommendation of Noltze et al. (2018) to sharpen the existing criterion of sustainability in order to come to more robust empirical findings.*

icy in the Philippines. This requires a substantial reconsideration of the situation of land-use rights and tenure security. To what extent this reconsideration, as well as continued support to good democratic governance and decentralized institutions, will be feasible in the current political climate in the country lies beyond the scope of the evaluation. The pragmatic approach by the Philippine–German Cooperation can be criticized as not addressing underlying pressing and structural problems of unequal land ownership, land titling and land-use rights.

Although these underlying issues are very difficult to handle in the case of the Philippines through land-use planning interventions alone, an enhanced land-use planning intervention might still be able to ease the pressures associated with insecure tenure and land-use rights by means of gradually formalizing, for instance, informal living arrangements. The intervention by the Philippine–German Cooperation reached a gradual formalization only to some extent. As our results show, a too narrow focus on planning can actually even exacerbate existing tensions around land use.

The aforementioned systemic challenges and underlying issues pose a threat to the impact of the intervention. We therefore conclude that land-use planning can only be successful when political and institutional conditions are conducive, and when plans are properly implemented. As obstacles, we identified frictions within local administrations, as well as in local policy-making (political and personal priorities conflicting with planning goals). Furthermore, high demands and striving for transparency by donor organizations might overburden local planning administrations; for example, interventions might bring previously hidden conflicts to the surface and may reveal inconsistencies to the public. This can be turned into a positive outcome, provided that local administrations are capacitated to handle these issues – something that could partially be achieved by the intervention. This is another argument for supplementing land-use planning with interventions for good governance. Other obstacles are associated with resources that are more limited after the finalization of the development intervention. In this case, ambitious goals in the development intervention are further pursued after the intervention – even on a national level, but with substantially fewer, maybe insufficient, financial and personal resources.

On the basis of this assessment, we recommend several solutions to the identified weaknesses and problems. We address these evidence-based recommendations to different types of actors and entities. The recommendations are intended to support: (a) political actors to improve strategic decision-making for future development interventions; (b) implementing agencies to improve development and design of new land-use planning interventions in the Philippines and other countries; (c) Philippine national agencies or ministries and the Philippine–German cooperation to continually improve land-use and development planning in the Philippines; and (d) Philippine political actors to improve the framework for land-use planning and development planning in the Philippines.

The recommendations refer to important aspects of designing and conducting land-use planning interventions, and refer to the consideration of essential context factors.

Several context and framework conditions are of substantial relevance to either the implementation and enforcement of plans, or the sustainability of intervention benefits. Addressing land-use rights and land-use conflicts are of utmost importance as they hamper the sustainability of land-use planning interventions and have negative distributional impacts. We recommend that land-use planning interventions need to address more systematically the underlying mechanisms to improve the unsolved situation of land-use rights and tenure security. In order not to overburden specific land-use planning interventions, this could be done through using synergies with good governance interventions.

As a major factor impeding the implementation and enforcement of plans, we identified negative local political conditions and power structures. Consequentially, such structures interrupt the impact chain after the finalization of planning documents. In these cases, implementation and enforcement is then either not carried out or not implemented according to plans. Thus, we recommend that land-use planning interventions need to do more to bind those actors to the common good and to make them accountable.

There is no doubt that land-use planning can only achieve anticipated development impacts when plans are properly implemented. Hence, we recommend several measures to ensure proper implementation and enforcement of plans. So-called CLUPs "for the shelf" have to be avoided. This includes the consideration of legally enforceable measures and sanctions if administrative implementation contradicts plans. Generally, public accountability of actors in land-use planning is not only an issue at the local level, but also an issue among planning authorities, and, thus, should be improved.

Our recommendations not only refer to the implementation of plans but also concern the improvement of planning itself:

Training and capacity-building of the development intervention led to measurable impacts. However, the situation of training and capacity-building in the eCLUP framework at national level looks different. Hence, we recommend that the system of training, capacity- and human resources development be overhauled in order to improve local planning capacities and to avoid a brain drain of technical staff. More and better-coordinated trainings are necessary. Long-term support for municipalities showed positive impacts, as did land-use planning in combination with other rural development interventions. Hence, for the planning of new interventions, we recommend the consideration of these two factors.

The development and approval process of land-use plans is lengthy, time- and resource-consuming. We address this issue in several recommendations on the adjustment of local CLUP development processes to ensure timely and effective plan development, a changed approval process, and better coordination between LGUs and between agencies at provincial level. Public participation and information in the development process should be strengthened, and efforts should be increased to ensure the consideration of local needs and priorities in the implementation of land-use plans. Participation efforts need to be substantiated with sufficient resources.

A large number of aspects of the intervention by the Philippine–German Cooperation have contributed to national policies and have heavily influenced national-level land-use planning policies, particularly the eCLUP guidelines. Thus, an early consideration of national scaling-up opportunities in the planning of new development interventions is recommended as it is contributing to the continuation of intervention benefits. We also recommend that horizontal innovation diffusion – from intervention municipalities to those not receiving an intervention – should be actively supported. In this case, provincial trainer pools and learning sites (in particular, ambitious municipalities that have proven to plan effectively) were promising concepts that are worth replicating.

In the Philippines, one of the main factors hampering development impacts is insufficient national framework conditions, which are the prerequisite for successful land-use planning. The lack of a consistent national framework leads to conflicting mandates and the inability to properly address unresolved issues of land-use rights and tenure security.

Development assistance and national expenditures for economic development could be more effectively spent if evaluations pointed to the effectiveness of interventions. Thus, we recommend that policy-makers and implementers need to consider the prerequisites for reliable and rigorous evaluations right at the start of the process of developing interventions.

ZUSAMMENFASSUNG

Land ist eine lebenswichtige Ressource. Es ist Grundlage für die sozioökonomische Entwicklung und das Funktionieren lokaler Ökosysteme. Um eine faire Beteiligung aller Landnutzerinnen und Landnutzer sowie die nachhaltige Nutzung sicherzustellen, ist ein umfassendes Landmanagement erforderlich, welches deutlich über eine Selbstregulierung hinausgeht. Das technische Instrument der Landnutzungsplanung ermöglicht eine inklusive und transparente Verteilung von Landressourcen und steuert die Nutzung von Land und natürlichen Ressourcen. Landnutzungsplanung zielt darauf ab, potenziell widersprüchliche Anforderungen an Land miteinander in Einklang zu bringen.

Der philippinische Fall zeigt, wie wichtig ein umfassendes Konzept für die Landnutzungsplanung und -entwicklung ist. Die Herausforderungen, mit denen die Philippinen konfrontiert sind, sind für viele Entwicklungsländer von grundlegender Bedeutung. Diese umfassen die Gefährdung durch Naturrisiken und den Klimawandel, die Knappheit von Land und anderen Ressourcen sowie auch gefährdete Ökosysteme. Die Bedeutung einer umfassenden Landnutzungsplanung wird durch anspruchsvolle sozioökonomische Rahmenbedingungen wie hohes Bevölkerungswachstum, ungleiche wirtschaftliche Entwicklung und Armut sowie eine sich modernisierende und dezentrale öffentliche Verwaltung unterstrichen. Solche physischen und sozioökonomischen Bedingungen erfordern eine ganzheitliche und breitere Planungsperspektive über Sektoren, Gebietskörperschaften und Ökosysteme hinweg. Landnutzungsplanung gestaltet ländliche und urbane Entwicklung, unterstützt die Anpassung an den Klimawandel und den Umweltschutz und trägt zur nachhaltigen Nutzung lebenswichtiger Ressourcen bei.

Dieser Bericht evaluiert eine umfassende Intervention zur verbesserten Landnutzungsplanung auf den Philippinen. Methodisch basiert er auf einer rigorosen Wirkungsevaluierung unter Anwendung eines Mixed-Methods-Designs. Kern dieser Evaluierung ist die Bewertung eines technischen Ansatzes für die verbesserte Landnutzungsplanung auf den Philippinen, der über einen Zeitraum von zehn Jahren umgesetzt wurde. Die Intervention wurde durchgeführt von der philippinisch-deutschen Entwicklungszusammenarbeit in Kooperation mit der philippinischen Planungsbehörde Housing and Land Use Regulatory Board (HLURB).

Der technische Ansatz wurde im Rahmen des Programms Environment and Rural Development (EnRD) entwickelt und von der Deutschen Gesellschaft für Internationale Zusammenarbeit (GIZ) gemeinsam mit den philippinischen Partnern verantwortet. Die Intervention ist ein typisches Beispiel für eine Maßnahme der technischen Entwicklungszusammenarbeit, da sie die systemische Kapazitätsentwicklung auf mehreren Ebenen mit der Erreichung langfristiger und entwicklungspolitischer Zielsetzungen verknüpft. Sie zielte darauf ab, Prozesse und Strukturen für die Landnutzungs- und Entwicklungsplanung auf den Philippinen zu verbessern. Inhaltlich wurden lokale Planerinnen und Planer für Landnutzung gefördert und weitergebildet, um durch die Verbesserung von Planungsprozessen und deren Umsetzung zu langfristigen sozioökonomischen und ökologischen Verbesserungen in verschiedenen Wirkungsfeldern beizutragen.

Darüber hinaus hat die Intervention zur verbesserten Landnutzungsplanung das Potenzial, zu den Zielen der aktuellen Entwicklungsagenden wie der Agenda 2030 für nachhaltige Entwicklung, Armutsbekämpfung, Umweltschutz und Verbesserung des Wohlergehens und der Sicherung der (ländlichen) Existenzgrundlage beizutragen. Die Evaluierung dieser Intervention liefert wertvolle Informationen für die Entwicklungszusammenarbeit im Allgemeinen, insbesondere für Maßnahmen zur Unterstützung guter (dezentraler) Regierungsführung und lokaler Eigenverantwortung, zum Katastrophenrisikomanagement oder zur Anpassung an den Klimawandel oder dessen Eindämmung. Die Ergebnisse sind für die strategische Frage relevant, wie lokale Eigenverantwortung aufgebaut und bewährte Verfahren von der lokalen auf die nationale Ebene ausgeweitet werden können.

Der *Enhanced-Land-Use-Planning*-Ansatz besteht aus einem ganzen Maßnahmenbündel, wie beispielsweise Trainingsmaßnahmen und technische Unterstützung sowie der Etablierung von Prozessen und Instrumenten für eine umfassende und partizipative Landnutzungsplanung. Die ursprüngliche Intervention mit dem Namen „SIMPLE" (*Sustainable Integrated Management and Planning for Local Government Ecosystems*) startete im Jahr 2006.

In intensiver Zusammenarbeit mit den Akteuren der philippinischen Planungs- und Landnutzungsverwaltung entwickelte die philippinisch-deutsche Zusammenarbeit in ausgewählten Gemeinden der Regionen Eastern Visayas (Region 8) und Western Visayas (Region 6) den Planungsansatz und setzte diesen um. In Kooperation mit der HLURB wurden im Zuge der Aktualisierung und Weiterentwicklung der sogenannten *enhanced Comprehensive Land Use Planning (eCLUP)-Guidebooks* Teile des SIMPLE-Ansatzes in die philippinische Planungspolitik überführt. Zum Abschluss des EnRD-Programms Ende 2015 wurden die nationalen eCLUP-Leitlinien offiziell eingeführt. Sie übernahmen wesentliche Bestandteile des bisherigen, lokal erprobten SIMPLE-Ansatzes.

Die vergleichende Betrachtung internationaler Interventionen im Bereich Landnutzungsplanung stuft den SIMPLE-Ansatz der GIZ als Intervention mittlerer technischer und administrativer Komplexität ein. Die auf den Philippinen umgesetzten Maßnahmen entsprechen dem Portfolio ähnlicher Interventionen in anderen Ländern, die über etablierte Verwaltungsstrukturen verfügen, jedoch eine Stärkung technischer Planungskompetenzen und einen verbesserten Austausch zwischen beteiligten Sektor-Behörden benötigen. Die Ergebnisse dieser Evaluierung können somit auf eine Reihe anderer Interventionskontexte und Länder übertragen werden.

Die Evaluierung befasst sich mit der Hauptfrage: Welche Wirkungen einer zehnjährigen Intervention der verbesserten Landnutzungsplanung lassen sich auf Haushalts-, Dorf- und Gemeindeebene feststellen?

In Anlehnung an die Evaluierungskriterien des Entwicklungshilfeausschusses der Organisation für wirtschaftliche Zusammenarbeit und Entwicklung (OECD-DAC) standen für diese Evaluierung vier Hauptevaluierungsziele im Vordergrund:

- Im Hinblick auf *Relevanz* stand die Frage im Mittelpunkt, ob die Maßnahmen zur verbesserten Landnutzungsplanung mit den aktuellen nationalen und internationalen Entwicklungsagenden (und damit mit den Prioritäten der Geber- und Partnerländer) vereinbar sind. Dies umfasst eine Untersuchung der Beiträge der Intervention auf die Erreichung der Ziele der nachhaltigen Entwicklung.
- In Bezug auf *Effektivität* wurde betrachtet, ob die Intervention die Durchführung der Landnutzungsplanung und die angewandte Planungstechnik verbessert hat und somit die Ziele der Entwicklungsmaßnahme erreicht wurden.
- Darüber hinaus sollten die *entwicklungspolitischen Wirkungen* der Intervention auf nachgelagerte Ziele gemessen werden, welche sozioökonomische und Umwelt-Indikatoren umfassen.
- Schließlich sollte die *Nachhaltigkeit* der Intervention durch die Bewertung der Dauerhaftigkeit der positiven Wirkungen betrachtet werden. Dies erfolgte insbesondere durch die Analyse der horizontalen und vertikalen Ausweitung der Intervention, der Diffusion von Wirkungen und Möglichkeiten der Replizierbarkeit des Ansatzes in anderen Kontexten.

Ziele, die im Bezug zum Effizienzkriterium stehen, wurden im Rahmen dieser Evaluierung nicht beleuchtet, unter anderem, da Daten zu den Kosten des Ansatzes mit unterschiedlichen Stakeholdern nicht separat zur Verfügung standen.

Den Kern bildet eine rigorose Wirkungsevaluierung, um Ergebnisse und Auswirkungen in fünf Wirkungsbereichen zu messen und zu quantifizieren. Diese Wirkungsbereiche umfassen

- die Verbesserung der Prozesse, Strukturen und Bedingungen in den Planungsverwaltungen,
- den Umgang mit natürlichen Ressourcen,
- Maßnahmen im Katastrophenrisikomanagement (DRM),
- die lokale Regierungsführung und
- die Verbesserung der Lebensbedingungen der betroffenen Bevölkerung.

Die Wirkungsfelder basieren auf einer umfassenden Rekonstruktion der ‚Theorie des Wandels' der Intervention.

Dieser umfassende Ansatz zur rigorosen Wirkungsmessung einer komplexen Intervention im Bereich der technischen Zusammenarbeit stellt eine Besonderheit dar. Die umfassende Wirkungsabschätzung von Planungsinstrumenten wird äußerst selten durchgeführt. Die Evaluierung trägt somit zur wissenschaftlichen Diskussion über die Wirksamkeit der Landnutzungsplanung und ihrer technischen Ansätze bei und zeigt, dass rigorose Wirkungsevaluierungen im Kontext komplexer technischer Entwicklungsmaßnahmen durchaus machbar und praktikabel sind. Diese Evaluierung orientiert sich an Evaluierungsstandards und verbindet methodische Rigorosität und Genauigkeit, Transparenz und Nachvollziehbarkeit mit Nützlichkeit, Fairness, Unabhängigkeit und Integrität.

Die Evaluierung folgt einem theoriebasierten Ansatz und fußt auf einem Mixed-Methods-Design. Paneldaten einer quantitativen Mehrebenen-Befragung wurden mit qualitativen Interviews und Fokusgruppendiskussionen sowie geographischen Daten und Informationen, einer Literaturauswertung und einer Dokumentenanalyse von Landnutzungsplänen verknüpft. Das initiale, methodische Design beruht auf einer Vorstudie zur ersten Runde der Datenerhebung von Garcia Schustereder et al. aus dem Jahr 2016.

Die Paneldatensätze umfassen 3.000 Haushalte verteilt auf 300 Dörfer in 100 Gemeinden, von denen manche GIZ-Unterstützung durch den SIMPLE-Ansatz erhielten. Sie verteilen sich über elf Provinzen der Visayas Regionen und wurden zu zwei Zeitpunkten erhoben (2012 und 2016). Die Methode der Wirkungsabschätzung beruht auf einem quasi-experimentellen Design, bei dem ein *Propensity-Score-Matching* mit zeitlich verzögerter abhängiger Variable angewandt wurde. Mit diesem Verfahren konnten ‚statistische Zwillinge' identifiziert werden, die auf unterschiedlichen, statistischen Merkmalen der Gemeinden, Dörfer und Haushalte basieren.

Hierdurch konnten die Wirkungen der komplexen Intervention zur Landnutzungsplanung attribuiert und die Wirkungen der Intervention methodisch rigoros gemessen und bewertet werden. Untersucht wurden die Auswirkungen auf eine Vielzahl von Indikatoren auf Haushalts-, Dorf- und Gemeindeebene in fünf inhaltlichen Wirkungsfeldern.

Hinsichtlich der OECD-DAC-Bewertungskriterien *Relevanz* und *Effektivität* ergeben sich folgende Schlussfolgerungen.

Die Intervention zeigt eine hohe *Relevanz*. Für dieses Kriterium wurde die Konsistenz der Intervention oder ihrer Ergebnisse mit den nationalen und globalen Entwicklungsagenden bewertet. Im Hinblick auf die globale Agenda zur nachhaltigen Entwicklung zeigt sich, dass umfassende Landnutzungsinterventionen ein erhebliches Potenzial aufweisen, zu den übergeordneten Zielen nachhaltiger Entwicklung (SDGs) beizutragen. Zugleich konnten im beobachteten Zeitpunkt nur wenige, messbare Effekte identifiziert werden, die zur konkreten Erfüllung bestimmter Ziele beitrugen.

Im Hinblick auf nationale Agenden trägt umfassende Landnutzungsplanung wesentlich zu den Zielen des philippinischen Entwicklungsplans 2012-2017 bei und spiegelt sich teilweise auch in mehreren sektoralen Strategien der deutschen Entwicklungszusammenarbeit wider. Die Ergebnisse bestätigen die Relevanz der Intervention, die auf die Verbesserung der Grundbedürfnisse der betroffenen Bevölkerung abzielt, im Einklang mit übergreifenden Entwicklungszielen. Maßnahmen zur Landnutzungsplanung können als Voraussetzung für die Durchführung anderer Maßnahmen zur Entwicklung des ländlichen Raums angesehen werden.

Im Hinblick auf die *Effektivität der Intervention* deuten die Ergebnisse darauf hin, dass eine verbesserte Landnutzungsplanung moderat effektiv war. Sie verbesserte die Landnutzungsplanung und -techniken sowie die Planungskapazitäten in den Interventionsgemeinden. Die Gemeinden, in denen die Intervention durchgeführt wurde, zeigen eine höhere Planqualität sowie Planvollständigkeit. Es wurde ferner ein positiver Effekt auf die Wahrscheinlichkeit der Plangenehmigung gefunden. Darüber hinaus trug die Intervention zu einer häufigeren Umsetzung verbindlicher Planungselemente bei. Die Intervention zeigte hingegen keine oder nur wenig (positive) Auswirkungen auf ‚weiche' Planungselemente wie stärkere Partizipation und Planintegration zwischen der Dorf- und Gemeindeebene. Die Intervention war zudem nicht in der Lage, strukturelle Probleme, die in Zusammenhang mit der Personalausstattung kommunaler Planungsverwaltungen stehen, adäquat zu adressieren. Ebenso wenig konnte die Durch- und Umsetzung der hergeleiteten Planungsziele verbessert werden.

Die Evaluierung zeigt auch, dass andere Maßnahmen zur ländlichen Entwicklung (z. B. andere Komponenten des EnRD-Programms) zu positiven Effekten der Intervention zur verbesserten Landnutzungsplanung beitragen. Umgekehrt ist zu beachten, dass eine funktionierende Landnutzungsplanung ein wichtiger Erfolgsfaktor für andere Maßnahmen der ländlichen Entwicklung ist. Landnutzungsplanung und andere Maßnahmen zur Entwicklung des ländlichen Raums sind somit wechselseitig voneinander abhängig.

Die Bewertung der Intervention anhand der OECD-DAC-Evaluierungskriterien *entwicklungspolitische Wirkungen* und *Nachhaltigkeit* führt zu folgenden Schlussfolgerungen.

In den Wirkungsfeldern ‚Nachhaltige Nutzung natürlicher Ressourcen', ‚Katastrophenrisikomanagement', ‚Lokale Regierungsführung' und ‚Lebensbedingungen von betroffenen Haushalten' wurden folgende begrenzte bis moderate Auswirkungen identifiziert:

- In Bezug auf die *nachhaltige Nutzung natürlicher Ressourcen* zeigte sich, dass die Intervention die Zahl der Naturschutzgebiete (nicht aber der Meeresschutzgebiete) und der Projekte zur Erhaltung und Sicherung der Existenzgrundlage ländlicher Haushalte wie z. B. Baumpflanzungen erhöhte. Es gab jedoch keine messbaren Auswirkungen auf die tatsächliche Veränderung der von den befragten Haushalten berichteten Landnutzung. Darüber hinaus zeigte sich keine Veränderung der Wahrnehmungs- oder Bewusstseinssteigerung der Haushalte für Themen des Umweltschutzes.
- Im Bereich des *Katastrophenrisikomanagements* wurde festgestellt, dass Gemeinden, in denen die Intervention durchgeführt wurde, verstärkte Kapazität für das Katastrophenrisikomanagement aufweisen. Dies zeigte sich insbesondere bei technischen und planerischen Maßnahmen zum Katastrophenschutz. Auf Dorf- und Haushaltsebene beschränkten sich positive Wirkungen (wie etwa die Stärkung des Bewusstseins bezüglich Katastrophen oder proaktivere Katastrophenmanagement-Strategien) auf die Gemeinden in Region 8 und jene, welche die Interventionen erst nach 2012 erhalten haben.
- Im Hinblick auf die *lokale Regierungsführung* wurden begrenzte Auswirkungen auf das Funktionieren und die Wahrnehmung der Lokalregierungen festgestellt, die meisten davon waren negativ. So wurde eine negative Auswirkung sowohl auf das Vertrauen als auch auf die Wahrnehmung des Funktionierens der lokalen Regierung in den Haushalten gefunden. Die zugrundeliegenden Machtstrukturen in vielen Kommunen wurden durch die Intervention nicht hinreichend berücksichtigt. Dies beeinflusste z. B. die Fertigstellung bzw. Umsetzung politischer Teile des eCLUP (z. B. Zonierung und Baunutzungsverordnung). Es muss angemerkt werden, dass ein Einwirken auf vorhandene, lokale Machtstrukturen über die Möglichkeiten und Ziele der ursprünglichen Intervention hinausgeht. Es wurde ferner ein signifikanter Effekt auf die Anzahl an Konflikten (Anstieg) in den Untersuchungsgemeinden festgestellt. Eine eingehendere Untersuchung stellte fest, dass die Intervention zu einer stärkeren Sichtbarkeit bereits bestehender – zuvor verdeckter oder latenter – Konflikte führte. Die Intervention trug zu einer aktiveren Konfliktbearbeitung durch Kommunen und Dörfer bei. Bei der Bereitstellung öffentlicher (kommunaler) Dienstleistungen wurden überwiegend positive Effekte gemessen.
- Schließlich wurde hinsichtlich der *Verbesserung der Lebensbedingungen von betroffenen Haushalten* nahezu kein zuordenbarer Effekt gefunden. Dies ist nicht verwunderlich, da sich das Wirkungsfeld der Wohlstandsverbesserung am Ende einer längeren Kausalkette befindet. Angesichts des Zeitpunktes der Intervention sowie der Evaluierung ist in diesem Wirkungsfeld nur mit langfristigen Effekten zu rechnen. Ferner sind positive Wirkungen nur dann zu erwarten, wenn die bestehenden Unterbrechungen der Kausalkette angegangen werden.

Neben den Auswirkungen in den Wirkungsfeldern gibt es mehrere Querschnittsergebnisse der Evaluierung:

1. Die Intensität der Auswirkungen nimmt von der kommunalen Ebene bis zur Ebene der Haushalte ab. Dies deutet damit auf mangelnde Umsetzung, fehlende Informationen und Mängel bei der Partizipation der Bevölkerung hin. Eine Reihe von erwarteten Auswirkungen sind daher (noch) nicht eingetreten. Dies war insbesondere auf der Ebene der Haushalte und Dörfer der Fall.
2. Als Querschnittsbefund durch alle Wirkungsfelder wurde festgestellt, dass mehr Training zu mehr und stärkeren Effekten führt.
3. Die Ergebnisse der Evaluierung verdeutlichen, dass langfristige Unterstützung tendenziell eher zu stärker positiven Effekten führt.
4. Stärkere Effekte sind zu beobachten, wenn zusätzlich zur Intervention andere unterstützende Maßnahmen, wie z. B. andere Komponenten des EnRD-Programms, umgesetzt wurden. Dies gilt insbesondere für Indikatoren der kommunalen Planung und der nachhaltigen Nutzung natürlicher Ressourcen.
5. Querschnittsfaktoren, die den positiven Wirkungen entgegenstehen, sind beispielsweise eine schwache Planumsetzung und -durchsetzung, unzureichende Informationsvermittlung und mangelnde Partizipation der Bevölkerung sowie fehlendes Personal und mangelhafte technische Ausstattung in den kommunalen Planungsverwaltungen. Dies sind Faktoren, die in der Verantwortung des philippinischen Planungssystems liegen.

In der Bewertung kann der Intervention ein hohes Maß an *Nachhaltigkeit* zugeschrieben werden, hier definiert als Dauerhaftigkeit der positiven Veränderungen und Wirkungen der Entwicklungsintervention.[3] Zentrale Elemente der Intervention wurden aufgegriffen und in die nationale Planungspolitik (eCLUP) integriert. Weitere positive Zeichen für die Dauerhaftigkeit der positiven Wirkungen sind die erfolgreiche Innovations- und Politikdiffusion des Planungsansatzes in Drittgemeinden. Verbesserte CLUP-Entwicklung in Gemeinden dauert an, ebenso sind mehr geschulte Mitarbeiterinnen und Mitarbeiter in der Planungsverwaltung vorhanden, die mit verbesserten institutionellen und technischen Verfahren arbeiten. Evidenzbasierte Planung entlang eines definierten Prozesses, technisches Schreiben und der Einsatz von geografischen Informationssystemen sind nun vorhanden. Einige der Verbesserungen durch die Intervention wurden überdies von anderen, nicht teilnehmenden Gemeinden durch informelle Wissensverbreitung und -weitergabe aufgegriffen. Gleichzeitig lässt sich jedoch feststellen, dass der partizipativen Planung ebenso wie dem Einbezug von Priorisierungen aus Dorfentwicklungsplänen in den neuen eCLUP-Richtlinien geringere Priorität (im Vergleich zur SIMPLE-Intervention) eingeräumt wird. Eine potenzielle Bedrohung für die Dauerhaftigkeit der positiven Veränderungen und Verteilungswirkungen stellen aktuelle Probleme mit Landtiteln, Landrechten und ungleicher Landverteilung auf den Philippinen dar. Aus unterschiedlichen Gründen haben weder SIMPLE noch eCLUP diese Problemstellungen in ihren *Enhanced-Land-Use Planning*-Ansätzen aufgegriffen.

Die Evaluierungsergebnisse unterstreichen, dass trotz ermutigender Ergebnisse einige Herausforderungen bestehen bleiben. Der Umfang künftig zu erwartender Wirkungen wird nicht zuletzt davon abhängen, mit welcher Intensität die Fort- und Ausbildungsmaßnahmen für Mitarbeiterinnen und Mitarbeiter der Planungsverwaltung fortgesetzt werden, inwieweit künftig Maßnahmen der Partizipation der Öffentlichkeit in Planungsprozessen durchgeführt werden, inwiefern Verbesserungen der öffentlichen Rechenschaftspflicht erreicht werden können und nicht zuletzt wie sich die künftige Ressourcensituation in den Planungsbehörden auf Provinz- und Gemeindeebene entwickeln wird. In diesen Bereichen identifiziert die vorliegende Evaluierung Schwachstellen. Personalengpässe können langfristig einen negativen Effekt sowohl auf die Implementierung und Durchsetzung von Landnutzungsplanung als auch auf ein langfristig angelegtes Monitoring

[3] *In der Analyse des Beitrags der Intervention zu den Zielen der nachhaltigen Entwicklung wurden – im Rahmen des OECD-DAC Kriteriums Relevanz – die breiteren Aspekte eines zeitgemäßen Nachhaltigkeitsverständnisses, einschließlich der sozialen, ökonomischen, ökologischen und politischen Dimensionen der nachhaltigen Entwicklung behandelt. Dies entspricht der Empfehlung von Noltze et al. (2018), das bestehende Kriterium der Nachhaltigkeit zu schärfen, um zu robusteren empirischen Erkenntnissen zu gelangen.*

kommunaler Landnutzung haben. Darüber hinaus ist die Nachhaltigkeit und die anhaltenden Wirkungen der Intervention entscheidend von institutionellen Faktoren (wie etwa der politischen Unterstützung in den betroffenen Gemeinden) und letztlich von der umfassenden Harmonisierung der Landnutzungspolitik auf den Philippinen abhängig. Dies erfordert eine substanzielle Überprüfung der Situation von Landnutzungsrechten und Besitzverhältnissen im staatlichen Gesamtkontext.

Inwieweit diese Überprüfung und Neubetrachtung sowie die weitere Unterstützung einer guten demokratischen Regierungsführung und dezentraler Institutionen im gegenwärtigen politischen Klima des Landes möglich sein werden, liegt außerhalb des Rahmens der Evaluierung. Der pragmatische Ansatz der philippinisch-deutschen Zusammenarbeit kann insofern kritisiert werden, dass zugrundeliegende Probleme, wie die ungleiche Verteilung von Landbesitz und Landrechte, nicht explizit adressiert werden.

Obwohl im Falle der Philippinen diese grundlegenden Fragen allein durch Interventionen im Bereich der Landnutzung sehr schwer zu bewältigen sind, kann verbesserte Landnutzungsplanung zumindest zu einem Prozess der graduellen Formalisierung der beschriebenen Problemfelder – z. B. von informellen Wohnverhältnissen – beitragen und so den Druck mindern. Die Intervention der philippinisch-deutschen Zusammenarbeit erreichte nur zum Teil eine graduelle Formalisierung. Die Evaluierungsergebnisse zeigen, dass eine zu enge Fokussierung auf Planung die bestehenden Spannungen um die Landnutzung sogar noch verschärfen kann.

Die genannten systemischen Herausforderungen und die zugrundeliegenden Probleme stellen eine Bedrohung für die *entwicklungspolitischen Wirkungen* der Intervention dar. Eine wesentliche Schlussfolgerung ist, dass Landnutzungsplanung nur dann erfolgreich sein kann, wenn die politisch-institutionellen Rahmenbedingungen auf lokaler und nationaler Ebene stimmen und die Pläne ordnungsgemäß umgesetzt werden. Als hinderlich für den Erfolg erwiesen sich Spannungen in den Lokalverwaltungen, die mit politisierten Entscheidungsprozessen in Planungsprozessen zusammenhingen, beispielsweise aufgrund politischer und persönlicher Prioritäten, die im Konflikt mit den Planungszielen stehen. Zugleich können die hohen Ansprüche hinsichtlich Transparenz seitens der Geber zur Überforderung von Lokalverwaltungen führen. Interventionen können beispielsweise bislang verborgene Konflikte und Inkonsistenzen in Planentscheidungen zum Vorschein bringen. Das Ergebnis kann sich als positiv herausstellen, sofern die lokalen Verwaltungen mit Kapazitäten ausgestattet werden und in der Lage sind, diese Probleme zu bewältigen; dies konnte durch die Intervention teilweise erreicht werden. Dies ist ein weiteres Argument, die Landnutzungsplanung durch Maßnahmen zur guten Regierungsführung zu ergänzen. Darüber hinaus sind andere Hindernisse mit Ressourcen verbunden, die nach Abschluss der Entwicklungsmaßnahme begrenzter sind: In diesem Fall werden ambitionierte Planungsziele und Umsetzungsprozesse der Entwicklungsintervention auch auf nationaler Ebene weiterverfolgt, selbst wenn nach Ende der Maßnahme die finanziellen und personellen Ressourcen wesentlich begrenzter, vielleicht sogar unzureichend sind. Zu substanziellen Entwicklungserfolgen können jedoch nur umgesetzte Pläne beitragen.

Aufgrund dieser Bewertung formuliert der Evaluierungsbericht Lösungsvorschläge für die festgestellten Herausforderungen und Probleme. Die evidenzbasierten Empfehlungen richten sich an unterschiedliche Einrichtungen und Akteure: Die Empfehlungen zielen (a) auf politische Akteure zur Verbesserung der strategischen Entscheidungsfindung für künftige Entwicklungsmaßnahmen, (b) auf Durchführungsorganisationen zur Verbesserung der Entwicklung und Gestaltung neuer Maßnahmen zur Landnutzungsplanung auf den Philippinen und in anderen Ländern, (c) auf nationale philippinische Behörden oder Ministerien sowie auf die philippinisch-deutsche Zusammenarbeit zur kontinuierlichen Verbesserung der Landnutzungs- und Entwicklungsplanung auf den Philippinen und (d) auf philippinische politische Akteure zur Verbesserung der Rahmenbedingungen für die Landnutzungs- und Entwicklungsplanung auf den Philippinen.

Die Empfehlungen beziehen sich auf mehrere wichtige Aspekte der Gestaltung und Durchführung von Maßnahmen der Landnutzungsplanung und auf die Berücksichtigung wesentlicher Kontextfaktoren.

Verschiedene Kontext- und Rahmenbedingungen sind für die Umsetzung und Durchsetzung von Plänen oder die Dauerhaftigkeit der positiven Veränderungen und Wirkungen der Entwicklungsintervention von erheblicher Bedeutung. Die Auseinandersetzung mit Landnutzungsrechten und Landnutzungskonflikten ist

von größter Bedeutung, da sie die Nachhaltigkeit der Landnutzungsplanung behindern und zudem negative Verteilungswirkungen haben. Wir empfehlen, dass die Maßnahmen der Landnutzungsplanung systematischer auf die zugrundeliegenden Mechanismen einwirken, um eine Verbesserung der ungelösten Situation der Landnutzungsrechte und der Besitzverhältnisse zu erreichen. Die Nutzung von Synergien mit Interventionen zur guten Regierungsführung könnte dafür sorgen, spezifische Maßnahmen zur Landnutzungsplanung nicht zu überlasten.

Als wesentliche Faktoren, die die Umsetzung und Durchsetzung von Plänen behindern, wurden negative lokale politische Bedingungen und Machtstrukturen identifiziert. Solche Strukturen unterbrechen die Wirkungskette nach der Fertigstellung der Planungsunterlagen. In diesen Fällen erfolgte die Umsetzung und Durchsetzung dann entweder gar nicht oder die Implementierung erfolgt nicht plangemäß. Es wird empfohlen, dass Maßnahmen zur Landnutzungsplanung mehr dafür tun müssen, um Akteure an das Gemeinwohl zu binden und diesem gegenüber verantwortlich zu machen.

Es besteht kein Zweifel, dass Landnutzungsplanung nur dann die erwarteten Auswirkungen auf die Entwicklung erzielen kann, wenn Pläne ordnungsgemäß umgesetzt werden. Es werden mehrere Maßnahmen zur Sicherstellung der ordnungsgemäßen Umsetzung und Durchsetzung der Pläne empfohlen. Sogenannte CLUPs „for the shelf" sind zu vermeiden. Dazu gehört die Prüfung von rechtlich durchsetzbaren Maßnahmen und Sanktionen, wenn die administrative Umsetzung gegen die Pläne verstößt. Generell ist die öffentliche Rechenschaftspflicht der Akteure in der Raumordnung nicht nur ein Thema auf lokaler Ebene, sondern auch bei den Planungsbehörden und sollte verbessert werden.

Die Empfehlungen beziehen sich nicht nur auf die Umsetzung von Plänen, sondern auch auf die Verbesserung der Planung selbst:

Fort- und Ausbildungsmaßnahmen und ein Kapazitätsaufbau der Entwicklungsmaßnahme führten zu messbaren, positiven, entwicklungspolitischen Wirkungen. Die Situation der Ausbildung und des Kapazitätsaufbaus im Rahmen der eCLUP-Richtlinien auf nationaler Ebene ist jedoch anders ausgestaltet. Daher lautet eine Empfehlung, das System der Fort- und Ausbildungsmaßnahmen sowie Kapazitäts- und Personalentwicklung zu überarbeiten, um die lokalen Planungskapazitäten zu verbessern und die Abwanderung von Fachkräften zu vermeiden. Mehr und besser abgestimmte Schulungen sind notwendig. Die langfristige Unterstützung der Gemeinden hat sich ebenso positiv ausgewirkt wie die Landnutzungsplanung in Kombination mit anderen Maßnahmen zur ländlichen Entwicklung. Für die Planung neuer Interventionen wird daher empfohlen, beide Faktoren zu berücksichtigen.

Der Entwicklungs- und Genehmigungsprozess von Landnutzungsplänen (CLUPs) ist langwierig, zeit- und ressourcenintensiv. Dieses Problem wird in mehreren Empfehlungen zur Anpassung der lokalen CLUP-Entwicklungsprozesse angesprochen. Die Empfehlungen sollen eine rechtzeitige und effektive Planentwicklung sowie einen geänderten Genehmigungsprozess sicherstellen und eine bessere Koordination sowohl zwischen Gemeinden als auch zwischen Behörden auf Provinzebene erreichen. Die Partizipation und Information der Bevölkerung am Entwicklungsprozess sollte verstärkt werden und erweiterte Anstrengungen sollten unternommen werden, um die Berücksichtigung der lokalen Bedürfnisse und die Prioritäten der Bevölkerung bei der Umsetzung der Flächennutzungspläne sicherzustellen. Die Partizipationsbemühungen müssen mit ausreichenden Mitteln untermauert werden.

Eine Vielzahl von Aspekten der Entwicklungsmaßnahme der philippinisch-deutschen Zusammenarbeit ist in die nationale Politik eingeflossen und hat die nationale Raumordnungspolitik, insbesondere die eCLUP-Richtlinien stark beeinflusst. Eine frühzeitige Berücksichtigung von Möglichkeiten des nationalen *Scaling-up* wird daher auch bei der Planung neuer Entwicklungsmaßnahmen empfohlen, da dies wesentlich zur Dauerhaftigkeit der positiven Veränderungen und Wirkungen beiträgt. Es wird empfohlen, die horizontale Innovations- und Politikdiffusion – von den Interventionsgemeinden zu den Gemeinden, die keine Intervention erhielten – aktiv zu unterstützen. Im Falle der Intervention der philippinisch-deutschen Zusammenarbeit war die Errichtung von Trainerpools auf Provinz-Ebene und von Lernorten (insbesondere ambitionierter und gut planender Gemeinden) vielversprechende Konzepte, die es wert sind, weitergetragen zu werden.

Unzureichende nationale Rahmenbedingungen als unabdingbare Voraussetzung für eine erfolgreiche Landnutzungsplanung sind auf den Philippinen ein Haupthindernis für Entwicklungswirkungen. Das Fehlen eines einheitlichen, nationalen Rahmens führt zu widersprüchlichen Mandaten und begrenzten Möglichkeiten, ungelöste Fragen der Landnutzungsrechte und der Besitzverhältnisse angemessen anzugehen.

Entwicklungszusammenarbeit und nationale Ausgaben für die wirtschaftliche Entwicklung können effektiver eingesetzt werden, wenn Evaluierungen die Wirksamkeit von Maßnahmen prüfen. Daher wird politischen Entscheidungsträgern und den durchführenden Institutionen empfohlen, die Voraussetzungen für eine zuverlässige und rigorose Evaluierung bereits zu Beginn des Entwicklungsprozesses von Interventionen zu berücksichtigen.

CONTENTS

Executive Summary iv

Zusammenfassung x

Abbreviations xxii

1. Introduction 2
   - 1.1 Land-use planning and development cooperation 3
   - 1.2 Purpose and objectives of the evaluation 4
   - 1.3 Evaluation criteria 5
   - 1.4 Structure of the report 7
2. Context 8
   - 2.1 Land policy and land administration in the Philippines 9
   - 2.2 The role of land-use planning 10
   - 2.3 Land-policy interventions in the Philippines 11
     - 2.3.1 Types and structure of land-policy interventions 11
     - 2.3.2 Evidence on the effects of land-use planning 12
     - 2.3.3 Sustainable Integrated Management and Planning for Local Government Ecosystems (SIMPLE) 13
     - 2.3.4 Enhanced Comprehensive Land-Use Planning (eCLUP) 15
     - 2.3.5 Recent developments in enhanced land-use planning 16
   - 2.4 Comparing planning interventions of technical development cooperation 17
3. Evaluation design 20
   - 3.1 Theory of Change 21
   - 3.2 Evaluation questions 25
   - 3.3 Design of rigorous impact assessment 28
     - 3.3.1 Quasi-experimental evaluation approach 28
     - 3.3.2 Survey data 29
     - 3.3.3 Methodological challenges 30
     - 3.3.4 Treatment variables and sub-group analyses 32
     - 3.3.5 Qualitative methods: key informant interviews and focus group discussions 34
4. Results 35
   - 4.1 Overview of impact fields and cross-sectional topics 36
   - 4.2 Impact Field 1: “Land-Use Planning” 37
     - 4.2.1 Description of impact field 37
     - 4.2.2 Evaluation questions and operationalization 37
     - 4.2.3 Results and discussion 37
   - 4.3 Impact field 2: “(Sustainable) Natural Resource Management“ 43
     - 4.3.1 Description of impact field 43
     - 4.3.2 Evaluation questions and operationalization 43
     - 4.3.3 Results and discussion 45

4.4 Impact field 3: “Disaster Risk Management” ... 49
4.4.1 Description of impact field ... 49
4.4.2 Evaluation questions and operationalization ... 50
4.4.3 Results and discussion ... 52
4.5 Impact field 4: “Local Governance” ... 56
4.5.1 Description of impact field ... 56
4.5.2 Evaluation questions and operationalization ... 56
4.5.3 Results and discussion ... 59
4.6 Impact field 5: “Welfare” ... 67
4.6.1 Description of impact field ... 67
4.6.2 Evaluation questions and operationalization ... 67
4.6.3 Results and discussion ... 68
4.7 Cross-sectional topic: policy and innovation diffusion ... 70
4.8 Cross-sectional topic: continuity of intervention benefits, national scaling-up, and German contribution ... 74
4.9 Cross-sectional topic: consistency with development agendas and contribution to the SDGs ... 76
5. Conclusions and recommendations ... 79
5.1 Conclusions ... 80
5.1.1 Overview ... 80
5.1.2 Effectiveness ... 80
5.1.3 Impact ... 81
5.1.4 Sustainability ... 85
5.1.5 Relevance ... 85
5.2 Recommendations ... 86
5.2.1 Recommendations for designing new land-use planning interventions and for improving ongoing land-use planning interventions ... 87
5.2.2 Recommendations for designing new land-use planning interventions ... 87
5.2.3 Recommendations specifically addressing land-use planning interventions in the Philippines ... 88
5.2.4 Recommendations for Monitoring and Evaluation (M&E) ... 91
6. References ... 93
7. Annexes ... 98
7.1 Annex: Details on methodology ... 99
7.1.1 Characteristics of the propensity score matching ... 99
7.1.2 Sample selection ... 106
7.1.3 Geographic analysis ... 106
7.1.4 Cross-sectional topic: Typhoon Yolanda ... 107
7.1.5 Diffusion analysis ... 108
7.1.6 Document analysis ... 112
7.1.7 Matching conditioning on lagged outcomes in comparison to DID-matching ... 113
7.2 Annex: Index creation ... 115
7.2.1 Approach to creating indices ... 115

7.2.2 Indices used in Impact field 1 115
7.2.3 Indices used in Impact field 3 116
7.2.4 Indices used in Impact field 4 117
7.2.5 Indices used in Impact field 5 119
7.3 Annex: Overview of land-use planning interventions by GIZ 121
8. Digital annex: Further documentation 124

Figures

Figure 1: Enhanced land-use planning embedded in the Philippine administrative planning framework 10
Figure 2: Overview of types of land-use planning interventions 11
Figure 3: Other EnRD projects applied in addition to Natural Resources Governance (NRG / SIMPLE) 14
Figure 4: Chronological perspective on land-use planning concepts 16
Figure 5: Land-use planning processes and comprehensive land-use plan 17
Figure 6: Systematic overview of planning interventions of technical development cooperation 19
Figure 7: Reconstructed Theory of Change 24
Figure 8: Simplified Theory of Change and evaluation objectives 25
Figure 9: Flow chart of mixed-methods strategy 29
Figure 10: Map of survey area 30
Figure 11: Geographical distribution of training material conditional on the intervention 72
Figure 12: Propensity score matching conditional on lagged outcome 100
Figure 13: Common support of propensity score 103
Figure 14: Distribution of propensity score before and after matching 104
Figure 15: Connections between LGUs based on travel time between municipal halls based on Open Street Map data 110
Figure 16: Moran scatterplot indicating the pattern of spatial clustering 111
Figure 17: Local Moran's I statistic and treatment of LGUs 112

Tables

Table 1: Operationalization of OECD/DAC evaluation criteria 6
Table 2: Sample size of survey data and CLUP assessment 31
Table 3: Overview of treatment variables 32
Table 4: Qualitative interviews and focus group discussions 33
Table 5: Outcome variables for Impact field 1 38
Table 6: Municipal-level models: treatment effects for land-use planning indicators 40
Table 7: Household-level models: treatment effects for land-use planning indicators 42
Table 8: Outcome variables for Impact field 2 44
Table 9: Municipal and barangay-level models: treatment effects for natural resource management indicators 46
Table 10: Household-level models: treatment effects for natural resource management indicators 48

Table 11: Outcome variables for Impact field 3 51
Table 12: Municipal- and barangay-level models: treatment effects for DRM indicators 53
Table 13: Household-level models: treatment effects for DRM indicators 55
Table 14: Outcome variables for Impact field 4 57
Table 15: Treatment effects for indicators related to aspect participation and inclusion 60
Table 16: Treatment effects for indicators related to aspect performance and responsiveness of local government 62
Table 17: Treatment effects for indicators related to aspect improved public services (infrastructure and social services) 64
Table 18: Treatment effects for indicators related to aspect conflicts and conflict management 65
Table 19: Outcome variables for Impact field 5 68
Table 20: Household-level models: treatment effects for welfare indicators 69
Table 21: Type of addressees of recommendations 86
Table 22: Models at different levels 100
Table 23: Probit model for estimation of propensity score 101
Table 24: Balancing of covariates for the estimation of the propensity score 104
Table 25: Comparison of the effects of typhoon Yolanda between treatment and control municipalities 108
Table 26: Reported effects of typhoon Yolanda from the official damage assessment report in intervention and control sites 108

Boxes

Text box 1: Evaluation sub-questions for the five impact fields 27

Abbreviations

A&D Land	Alienable and Disposable Land
ANGOC	Asian NGO Coalition for Agrarian Reform and Rural Development
ATT	Average Treatment Effect on the Treated
BDP	Barangay Development Plan
BMZ	German Federal Ministry for Economic Cooperation and Development
CARP	Comprehensive Agrarian Reform Project
CBFM	Community Based Forest Management (Component of EnRD programme)
CCA	Climate Change Adaptation
CDP	Comprehensive Development Plan
CLUP	Comprehensive Land-Use Plan
CORA	Climate and Disaster Risk Assessment
DA	Department of Agriculture of the Philippines
DAC	Development Assistance Committee of the OECD
DAR	Department for Agrarian Reform of the Philippines
DENR	Department for the Environment and Natural Resources of the Philippines
DEval	German Institute for Development Evaluation
DID	Difference-in-Differences
DILG	Department of the Interior and Local Government of the Philippines
DRM	Disaster Risk Management (Component of EnRD programme)
DRRM	Disaster Risk Reduction and Management
eCLUP	enhanced Comprehensive Land-Use Planning
EFOS	Enhancement of Food Security (Component of EnRD programme)
EnRD	Environment and Rural Development (Programme)
FGD	Focus Group Discussion
FLUP	Forest Land-Use Plan
FMB	Forest Management Bureau
GDC	German Development Cooperation
GIS	Geographic Information System
GIZ	Deutsche Gesellschaft für Internationale Zusammenarbeit
GNP	Gross National Product
GPS	Global Positioning System
HH	Household
HLURB	Housing and Land Use Regulatory Board
ICM	Integrated Coastal Management (Component of EnRD programme)
IIED	International Institute for Environmental Development
LGU	Local Government Unit
LUP	Land-Use Planning
MGB	Philippine Mines and Geoscience Bureau
MPDC	Municipal Planning and Development Council
MPDO	Municipal Planning and Development Officer

NCI	National Convergence Initiative
NEDA	National Economic Development Authority
NRG	Natural Resources Governance (Component of EnRD programme)
OECD	Organisation for Economic Co-Operation and Development
OLS	Ordinary Least Squares Regression
OSM	Open Street Map
PDG	Policy Development Group (of the HLURB)
PHP	Philippine Peso
PLUC	Provincial Land-Use Committee
PLUDP	Participatory Land Use and Development Planning
PLUP	Participatory Land Use and Planning
PS	Propensity Score
PSM	Propensity Score Matching
SDGs	Sustainable Development Goals
SIMPLE	Sustainable Integrated Management and Planning for LGU Ecosystems
SRTM	Shuttle Radar Topography Mission
ToC	Theory of Change
ZO	Zoning Ordinance

1. INTRODUCTION

1.1 Land-use planning and development cooperation

Land is more than a strategic resource. It is the foundation for individual and collective development and progress and is vital to local ecosystems. It serves as the basis for the livelihood of rural farmers; it is the foundation of the homes and businesses of urban dwellers; it is the habitat for plants and animals. Furthermore, land is, in many societies, a highly important aspect of socio-economic status and a cultural symbol infused with deep ethno-historic meaning for the local population. At the same time, the use and ownership of land may also be determined by certain socio-economic or cultural characteristics, such as gender, indigenous status, or poverty.

This multitude of different demands, partially consistent and harmonious, but partially competing or conflicting, underlines the importance of a comprehensive management of land beyond self-regulation. Land-use planning, understood as the management principle behind the allocation of land and its use, is thus the guiding and balancing principle for social and economic development and progress. Moreover, it is the mechanism for ensuring the consideration of stakeholders with little to no bargaining power, such as landless dwellers.

Land-use planning is established as a technical mode of administration in most countries. However, the arrangement of land-use planning systems differs widely, depending on the system of political governance, administrative complexity, and regulatory power. Decreasing poverty and increasing wealth calls for a commensurate increase in public accountability. Hence, land-use planning has become a topic of wider societal interest, as it can have a substantial influence on people's living situations and livelihoods. At the same time, due to the symbolic meaning of land, it is rarely an issue that can be negotiated rationally, nor easily regulated in a neutral manner. For these reasons, an analysis of land-use planning exemplifies the limitations of attempts to solve culturally meaningful social issues with rational, evidence-based policies.

The Philippines are characterized by geographic and ecological variety, and by population growth on limited fertile land, but also by cemented rural poverty, unresolved indigenous claims over ancestral land, and vulnerability to the effects of natural disasters and global climate change. In this setting, land-use planning fulfils more than a mere management function. It is required as the foundation for wider socio-economic development, to enhance disaster preparedness and to protect vulnerable ecosystems from overuse and degradation. At the same time, administrative complexity and inertia, overlapping and competing mandates among governmental bodies, and little participation and transparency in public management, set challenging framework conditions for the implementation of land-use planning. Both the catalytic function of land-use planning and the substantial challenges associated with it make land-use planning an important topic for development cooperation. Thus, land-use planning interventions are cases from which evaluations can draw wider lessons, for example, on the role of legislation, on (decentralized) institutions, or on local participation in decision-making.

To improve the situation of land-use planning in the Philippines, the Philippine–German Cooperation, managed by GIZ, implemented an intervention with the goal to improve land-use planning among Philippine provinces and municipalities[4]. In the overarching scheme of the Environment and Rural Development (EnRD) programme, GIZ developed a technical approach with the goal of improving Comprehensive Land-Use Plans (CLUP) in Philippine municipalities. The "Sustainable Integrated Management and Planning for Local Government Ecosystems" (SIMPLE) approach aimed to capacitate municipal planners with the skills and technique necessary to develop and implement improved land-use plans in their municipalities. These plans are supposed to cover all municipal lands by embracing an ecosystem-centred approach to planning called the "ridge-to-reef"[5] approach. Furthermore, plans are supposed to systematically incorporate barangay-level development goals and plans, as well as provincial framework plans, to ensure the consistency of planning

[4] *While the Philippine administrative system differentiates between "cities" and "municipalities", we use the term municipality throughout the report if we mean the particular level of administration, i.e. the municipal level. If we explicitly refer to the administrative unit of local governments, we use the term LGU.*

[5] *This widely used concept embraces an integrative view of the ecological linkages between salt- and freshwater ecosystems, mostly in developing contexts. In the Philippine planning context it has become a synonym for planning of all municipal lands (and ecosystems).*

goals throughout the administrative hierarchy. They are supposed to ensure intensive public participation, to respect the interests of vulnerable groups such as indigenous people or the landless, to be gender-sensitive, and are supposed to be enforced and continuously monitored to ensure a coherent and structured development of municipal territories.

The development and implementation of a training and capacitation scheme at municipal and provincial level by the Philippine–German Cooperation started in 2006. In the continuously updated and developed intervention, a growing number of municipalities, with a total of 44 municipalities in two regions (region 6 and region 8) received technical support through SIMPLE. Close cooperation with the Philippine counterpart from the Housing and Land Use Regulatory Board (HLURB), the Philippines's national housing and land-use planning and administration agency, has been established, leading to a mainstreaming of key parts of the intervention into national policy-making for planning land use. The EnRD programme concluded in 2015, shortly after the new national guidebook on enhanced Comprehensive Land-Use Planning (eCLUP) was officially launched.

As of today, land-use planning in the Philippines has made major steps, but substantial challenges in practical implementation of land-use planning and in the overarching land-use planning framework remain. Given the challenging framework and environmental conditions, land-use planning will remain high on the agenda of the Philippines for the foreseeable future.

1.2 Purpose and objectives of the evaluation

This evaluation is concerned with the question: what effects of ten years of enhanced land-use planning efforts in the Philippines can be identified at the household (HH), barangay and municipal level, applying a rigorous impact-assessment design. With our methodological approach we can measure outputs, outcomes and impacts of the combined effects of the participatory land-use planning approach "SIMPLE" by the Philippine–German Cooperation and the enhanced land-use planning approach, following the eCLUP Guidelines 2013/2014 by the Housing and Land Use Regulation Board (HLURB). We can further identify whether other components of the EnRD programme contributed to increase the effects.

The report aims primarily to evaluate a complex technical development approach in a broad perspective and is based on a reconstructed and comprehensive Theory of Change (ToC). This assessment goes beyond a project evaluation and does not seek to verify the outcomes and impacts of the aforementioned German development intervention for political accountability and project quality control. The purpose of the evaluation can be summarized as follows:

- To contribute to the discussion and to demonstrate the potential for and feasibility of conducting, in a real-life scenario, a rigorous impact evaluation of a comprehensive technical development intervention that addresses all the problems associated with the complexity of the object of evaluation as well as of the stakeholder setting.
- To inform political and administrative stakeholders in Germany about the potentials, benefits and risks associated with the implementation of enhanced land-use planning and management, and local governance interventions. The goal is to improve knowledge for future decision-making and strategic programme development among political and administrative stakeholders in Germany.
- To contribute to learning and improved policy-making with collaborating institutions and members of the reference group in the Philippines; to accompany the Philippine stakeholders in the process of institutional knowledge uptake on enhanced land-use planning in general with regard to the findings of the evaluation and implementation of recommendations in particular.

Based on the results of the impact assessment, we therefore draw lessons from the Philippine experience for all involved stakeholders: first, to improve current initiatives in land-use planning in the Philippines, and, second, to provide guidance for future interventions to improve comprehensive land-use planning in the development context.

This main purpose of the evaluation leads us to follow four main evaluation objectives, as prioritized with the reference groups in Germany and the Philippines:[6]

1. To identify whether enhanced land-use planning is consistent with current development agendas. This includes the contribution of enhanced land-use planning to the Sustainable Development Goals (SDGs) as current global development agenda. (*Relevance of the intervention*)
2. To identify whether, to what extent and under what conditions enhanced land-use planning improved land-use planning and planning techniques. (*Effectiveness of the intervention*)
3. To identify whether, to what extent and under what conditions enhanced land-use planning impacted land-use practices and (sustainable) natural resource management, local governance, disaster risk management (DRM), and welfare. (*Impact of the intervention*)
4. To assess the sustainability in terms of continuity of intervention benefits, particularly by assessing the scaling-up of local approaches to national level, innovation and policy diffusion, and towards replication of the approach. (*Sustainability of the intervention*)

This evaluation report follows up on preliminary findings obtained in the baseline study on the intervention by Garcia Schustereder et al. (2016). While the previous study used survey data collected in 2012, the present evaluation report relies on a longitudinal survey design, using data obtained in surveys from two points in time, 2012 and 2016. It applies a quasi-experimental evaluation design, using propensity score matching (PSM) with lagged outcomes. The evaluation makes extensive use of geographic data and qualitative interviews, which we apply to verify the Theory of Change (ToC) and for the contextualization of results. This evaluation is guided by the standards for DEval evaluations (DEval, 2018) in its design and implementation. It combines methodological rigour and accuracy, transparency and scientific accountability with utility, fairness, independence, and integrity.

1.3 Evaluation criteria

This impact evaluation follows the criteria for evaluating development cooperation by the OECD / DAC and its application for the German Development Cooperation (GDC) (BMZ, 2006; OECD, 1991). Table 1 gives an overview of how we operationalize the criteria in this evaluation. The main purpose of this evaluation is the measurement of effects that can be attributed to enhanced land-use planning interventions. We therefore need to elaborate on the key term "impact", which is used differently in rigorous impact assessments compared with the OECD-DAC definition. *Impact* in the sense of OECD-DAC describes the direct or indirect long-term effects of an intervention. Impact evaluation, on the other hand, describes a methodological approach for establishing attribution of effects through a counterfactual analysis. Using an impact-evaluation design, we are therefore able to attribute effects directly to the intervention, which might be outputs, outcomes, or long-term effects.

OECD-DAC defines only the latter as *impact*. We capture this difference in detail when we elaborate on the reconstruction of the ToC of enhanced land-use planning (see section 3.1). In the ToC, we establish a detailed Output–Outcome–Impact pathway. To maintain consistency with OECD-DAC, we decided to follow the terminology of OECD-DAC in this report. Hence, we operationalized *Effectiveness*, defined as the extent to which the development intervention achieved its objectives, as the results of enhanced land-use planning (on Output and Outcome 1 level), generally specified in the objectives of the intervention. Thus, we operationalized *effectiveness* in impact field 1.

[6] *The criterion* efficiency *was not an objective of this evaluation (please see details in subsequent section 1.3).*

Table 1: Operationalization of OECD/DAC evaluation criteria

Criteria	Effectiveness	Impact	Sustainability	Relevance	Efficiency
Operationalization	referring to the effects of the intervention and to which extent the intervention's objectives were achieved	referring to the long-term effects of the intervention	referring to the continuation of intervention and intervention benefits	referring to the consistency of the intervention objectives with national and global development agendas (incl. SDGs)	not the focus of this evaluation

We operationalized *Impact* which is defined as "positive and negative primary and secondary long-term effects produced by a development intervention, directly and indirectly, intended or unintended" (OECD, 1991) in the following way: descending the Output–Outcome–Impact pathways of the reconstructed ToC, we defined *impact* as effects on Outcome 2 and Impact level in the ToC. Thus, we operationalize *impact* in the Impact fields 2 to 5, as specified in the ToC.

Sustainability relates to the "continuation of benefits from a development intervention after major development assistance has been completed" (OECD / DAC, 2002).[7] In the context of this intervention, the EnRD programme closed at the end of 2015, and large parts of the "SIMPLE" approach have been subsequently merged with the eCLUP approach by the HLURB. Hence, we operationalized *sustainability* firstly in the assessment of the uptake by the Philippine governmental agencies and local government units (LGUs) as parts of the development intervention, and secondly in the continuation of measured effects. A third aspect was discussed in the application of the OECD-DAC criteria for GDC referring to the contribution of the intervention to sustainable development, particularly with regard to economic, social, political and environmental factors (BMZ, 2006). In cross-sectional topic 2, this evaluation pursues an assessment of the contribution of enhanced land-use planning to the SDGs. Since the SDGs are part of the current global development agenda, we decided to elaborate on the SDGs in the discussion of the evaluation criterion *Relevance*.

Relevance, according to OECD-DAC, is understood as whether the objectives of the intervention "are consistent with beneficiaries' requirements, country needs, global priorities and partners' and donors' policies" (OECD / DAC, 2002). We operationalize *relevance* as consistency of intervention objectives with national and global development agendas. We assess whether the intervention was, and still is, suited to solve urgent topics of the Philippine development agenda, whether it is consistent with the German development objectives and the global development agenda, the latter in the form of its consistency with and its contribution to the SDGs.

In the context of enhanced land-use planning in the Philippines, it is important to note that the criteria *relevance* and *sustainability* are closely linked, as the development intervention of the Philippine–German Cooperation had been up-scaled to national level in the form of the eCLUP guidelines of the Philippine government. In this process, the intervention was adapted according to national priorities.

The criterion *Efficiency* is not addressed by this impact evaluation. The reasons are manifold. First, the evaluation is concerned with the impact assessment of a technical approach to enhanced land-use planning and is not concerned with the evaluation of a project or programme. The technical approach SIMPLE had been developed within the Natural Resources Governance (NRG) component of the EnRD programme. This makes a proper assessment of *efficiency* impossible, because separate financial data for the approach are not available, and implementation costs for the approach were partially borne by the local governments themselves.

[7] *We covered the broader aspects of a contemporary, Agenda 2030, understanding of sustainability, including the social, economic, ecological, and political dimensions of sustainable development in the analysis of the intervention's contribution to the sustainable development goals in the OECD-DAC criterion Relevance. This is in line with the recommendation of Noltze et al. (2018) to sharpen the existing criterion of sustainability in order to come to more robust empirical findings.*

Second, the approach of enhanced land-use planning was implemented by the Philippine–German Cooperation and the HLURB, efforts that cannot be clearly distinguished in recent years. Third, the effects are measured at household, barangay and municipal level, but cost data on this level are not available; activities on the local level by the EnRD programme were pooled between the different components of the programme. Due to these issues, the reference group agreed not to include the efficiency criterion in the assessment.

1.4 Structure of the report

Impact assessments need to consider the context and details of the intervention in order to attribute measured effects correctly to the different intervention activities that have taken place. Therefore, in chapter 2, we discuss in detail the context of land-use planning in the Philippines. In section 2.3 of the same chapter, we present the different intervention arms of enhanced land-use planning in the Philippines, notably the SIMPLE approach by the Philippine–German Cooperation and the eCLUP concept of the HLURB. Both approaches share many features, and SIMPLE continuously merged with the now nationwide mandatory eCLUP approach.

Chapter 3 gives an overview of the evaluation design. For this evaluation, we follow a theory-based approach and present the reconstructed ToC in section 3.1, followed by the evaluation questions derived from the objectives and ToC (section 3.2).

Complex interventions require a well-thought methodological design in order to separate effects, to reduce the influence of confounding factors, and to attribute the effects to the intervention. Section 3.3 gives detailed insights into the applied methodology catering for the challenges of measuring effects of complex interventions. We present methodological challenges in section 3.3.3, including typhoon Yolanda that heavily hit large parts of the study region in late 2013, after the first round of data collection.

Chapter 4 represents the core of this report, as it presents the results of the impact assessment, starting with an overview of impact fields (section 4.1). Subsequent sections (4.2–4.6) present the results of the impact fields.

We present important cross-sectional topics in sections 4.7 to 4.9: first, the effects of policy and innovation diffusion on municipalities that did not receive the intervention; second, the national scaling-up of the intervention and the continuity of the intervention's benefits as well as the contribution by the German development cooperation; and third, the consistency of the enhanced land-use planning with development agendas and the SDGs.

In chapter 5, we draw several important conclusions from our findings (section 5.1) and develop recommendations suitable for improving enhanced land-use planning interventions in the Philippines, for future land-use planning interventions and replications in other countries, and for improved land-use planning intervention evaluation and monitoring (section 5.2).

2. CONTEXT

2.1 Land policy and land administration in the Philippines

Land policy plays a prominent role in the Philippine legislation. Its importance is underlined by the strong economic relevance of farming and agriculture, given a growing population and economy, in contrast to strongly limited resources in terms of arable land. The Philippine approach to land-management policy follows a sectoral approach: the management of different types of land by different sectoral authorities. For instance, while the municipality is responsible for planning the use of Alienable & Disposable (A&D) land, management of forest land resides under the mandate of the Department for the Environment and Natural Resources (DENR). Critics underline the lack of synchronization and the fragmented nature of land management (GIZ and ANGOC, 2014).

Besides land management split between different authorities, the topic of land-use rights and tenure security remain high on the Philippine political agenda. Since 1986, and codified in the Comprehensive Agrarian Reform Law (1988), the Philippine government's Department for Agrarian Reform (DAR) is engaged in the process of a comprehensive agrarian reform (Comprehensive Agrarian Reform Project – CARP). This process aims at redistributing A&D land and private land, and formalizing property rights (GIZ and ANGOC, 2014). The concentration of land ownership among powerful, often local, political elites, and their defence of the existing land distribution, remains an unresolved issue (Dela Cruz and Ballesteros, 2006). In addition, indigenous peoples, who have historically inhabited forest land without titles, are currently facing the challenge of securing titles for land that is officially not deemed for human settlement, while more wealthy Filipino citizens are able to secure titles and encroach on indigenous land.

While the topics of land management, tenure rights, and agrarian reform are inherently interlinked, a coherent management of land under a single administrative or legislative roof has never been achieved. As a result, conflicts caused by overlapping mandates and continuous implementation of the agrarian reform persist. Meanwhile, the agrarian reform and issues of tenure security remain under the mandate of the DAR, supported by the DENR, which is responsible for cadastral surveying and the management of all public lands. The planning of land use through the formulation of planning guidelines and provision of technical planning assistance is under the mandate of HLURB. The situation is further complicated by the fact that regional planning, with Provincial Development and Physical Framework Planning (PDPFP) as the superordinate framework for municipal land-use planning, resides with the National Economic Development Authority (NEDA). Development planning on both municipal and barangay level is allocated to the Department of the Interior and Local Government of the Philippines (DILG).[8] Conflicts between mandates and overlapping boundaries are thus still common phenomena. While plans prepared within different administrative units are supposed to be harmonized, conflicting planning goals exist.

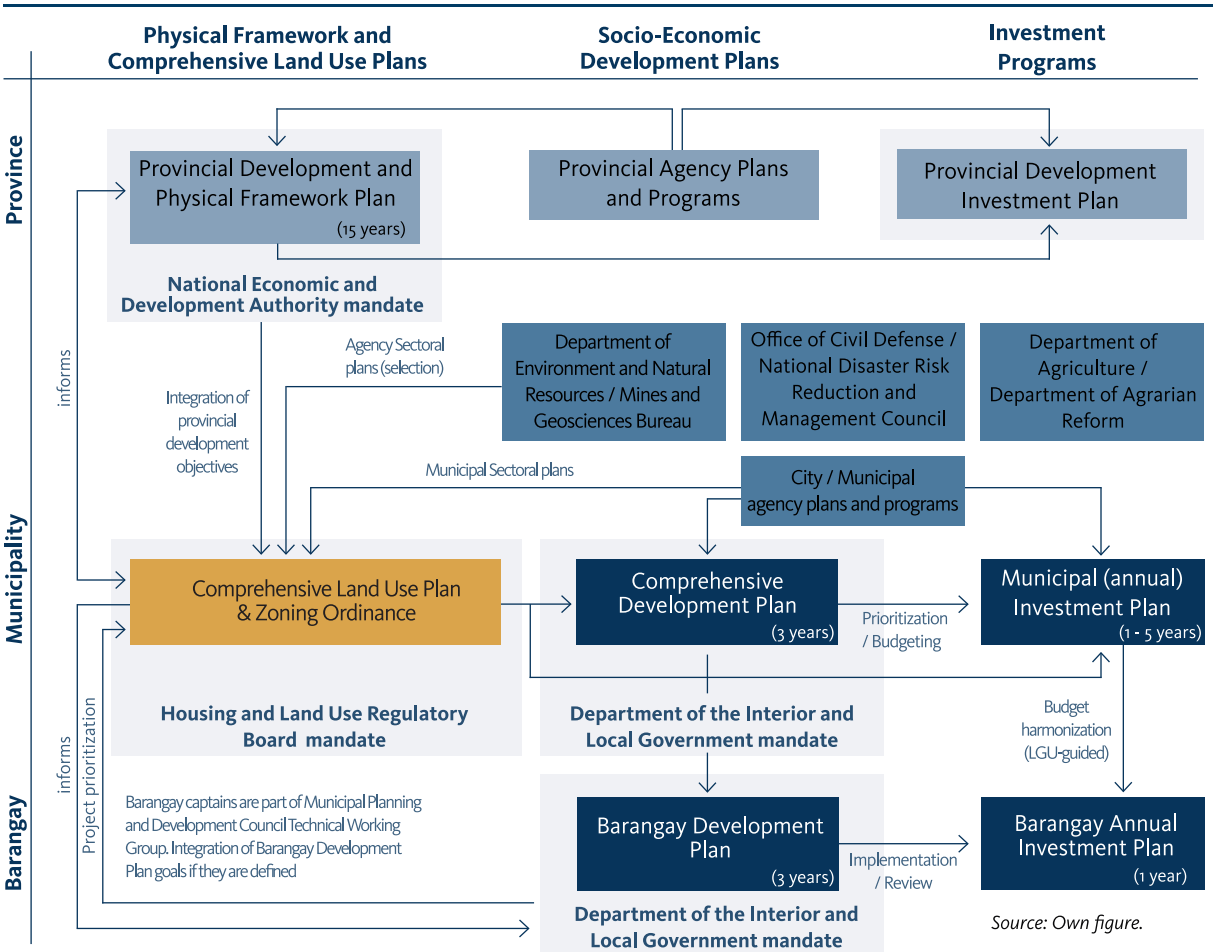
Land-use planning, as the allocation of land uses in different areas and the delineation of zones, is thus operating in a complex environment of conflicting mandates between various government agencies. In turn, the fields of tenure security and land-use rights remain largely unaffected by the planning process and was also explicitly not part of the SIMPLE intervention. Without a coherent integration of these issues, land-use planning is thus not able to address the underlying power relations that form the foundation upon which land-use planning is operating.

[8] *The growing population and economy, the country's high susceptibility to natural hazards and the effects of global climate change, and its sensitive natural resources make a comprehensive management of all territories and ecosystems increasingly necessary. Figure 1 gives an overview of administrative structures and responsibilities in land-use planning in the Philippines.*

2.2 The role of land-use planning

In the Philippines, land-use planning plays a key role in allowing for equal participation of the population in access to the scarce land resources of the archipelago. The growing population and economy, the country's high susceptibility to natural hazards and the effects of global climate change, and its sensitive natural resources make a comprehensive management of all territories and ecosystems increasingly necessary.

Figure 1: Enhanced land-use planning embedded in the Philippine administrative planning framework



Source: Own figure.

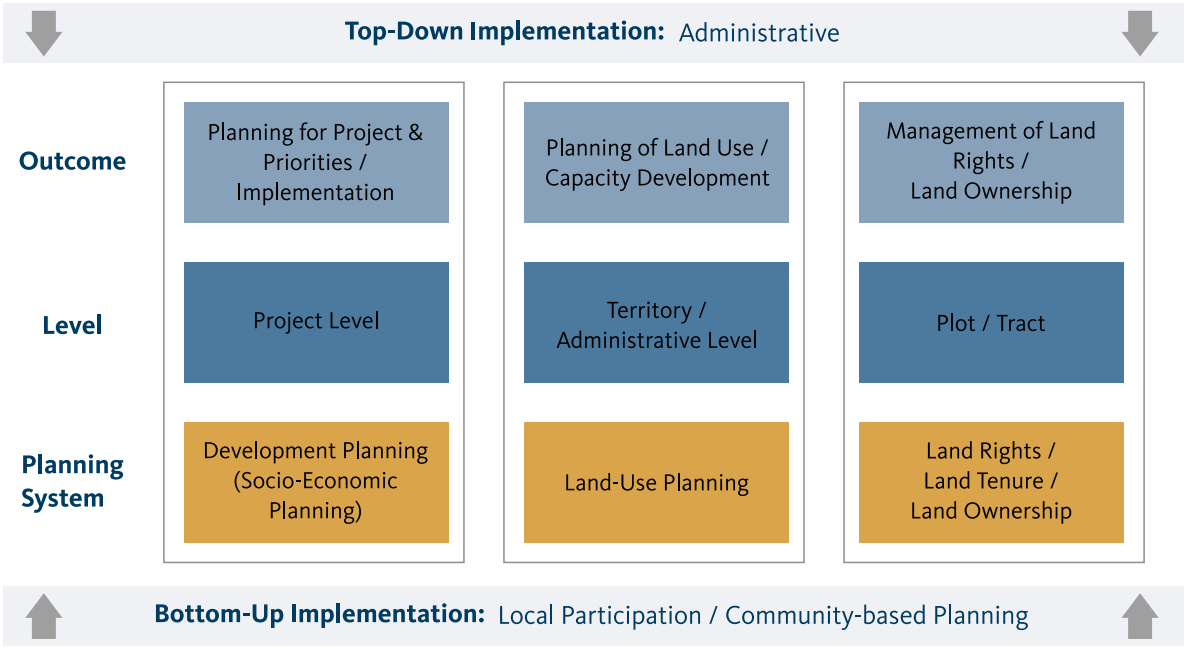
Note: National and regional planning hierarchy as well as civil society participation not displayed.

Land-use planning is a mechanism to enable safe and sustainable living conditions and livelihoods for the population, while preserving vital ecosystem functions by balancing and reconciling different interests through fair and transparent management processes.

Land-use planning functions are carried out at different levels of the Philippine administrative hierarchy (Figure 1). However, with the introduction of the Local Government Code in 1991 the main responsibility for land-use planning was transferred to the municipal level. LGUs are required to formulate CLUPs that serve as the basis for spatial development and the zoning of municipal territories, and set the foundation for development planning (Wehrmann, 2011). However, until the middle of the first decade of the new millennium, land-use planning processes were scattered between different ecosystems of the same municipality and, as mentioned before, between different authorities with separate but partially overlapping mandates (Lech and Leppert, 2018). Ad hoc decision-making in spatial planning, zoning, and project prioritizations dominated the planning process and depended on the prioritization of municipal executives or local

elites (Corpuz, 2012). Hence, land-use planning and management was not able to sufficiently address pressing issues of Philippine society in use of land and water bodies. The urgency of a change in the land-use planning approach has been increasingly visible through land scarcity, decreasing land resources, and resource degradation. It is also motivated by the goal to enable sustainable livelihoods and living conditions and to improve local governance and transparency. This multitude of goals underlines the importance of cooperation between relevant institutions and their mandates.

Figure 2: Overview of types of land-use planning interventions



Source: Own figure.

2.3 Land-policy interventions in the Philippines

2.3.1 Types and structure of land-policy interventions

Development interventions that are concerned with an improvement in land-use and development planning have been part of the standard support portfolio of technical development assistance for several decades. Goals and the depth of intervention vary substantially, depending on the local context and the goals of the development intervention. In a simplified perspective, one can differentiate between the systems the intervention aims at, the mode of implementation, and the goals and outcomes of the intervention (see Figure 2):

For instance, many low- and middle-income countries possess certain systems of socio-economic planning (development planning) which are used to supply basic infrastructure (such as schools and hospitals). A land-policy intervention in this field might simply add a spatial perspective to the existing development-planning system by allocating land to project development and enhancing the spatial distribution of projects (left column of Figure 2). If land-use planning systems already exist, interventions can aim at integrating various administrative or territorial units, or aim to enhance planning capacity at various levels of the spatial-planning administration (middle column of Figure 2). In this mode, regional and local plans are integrated to ensure consistency across administrative levels. Lastly, development intervention can aim at changing or improving the underlying titling and land registration systems, which usually reside below the actual land-use and development planning on the individual plot or tract level (right column of Figure 2). In

these interventions, the underlying mechanisms of ownership, land-use rights, and tenure status are disentangled and commonly formalized. Overarching goals of development interventions in land-use planning systems can range from enabling territorial development to protecting sustainable natural resources or biodiversity, from enhancement of food security (EFOS) to conflict management or the implementation of DRM and climate-change adaptation (CCA) (Wehrmann, 2011).

Beyond the difference in interventions across the scale of the planning system, level and desired outcomes, one can differentiate between top-down implementation, usually concerned with changing legislation and improving administration, and bottom-up planning, concerned with integrating the perspective of locally affected people into the planning process. This is achieved by engaging in modes of participatory rural appraisal. In reality, top-down and bottom-up measures are mixed in the implementation of interventions in planning systems. Lastly, and because the different planning systems are commonly interlinked, interventions often aim to integrate targets and improve the planning workflow between different hierarchy levels.

As a general principle for land-use planning interventions, it is essential to ensure local ownership, alignment, and harmonization with the existing planning system, and capacity development in planning administrations (Wehrmann, 2011). The large variance in land-use planning interventions in development cooperation, and differences in contextual conditions, make a comprehensive comparison of outcomes between different development interventions concerned with land-use planning challenging.

2.3.2 Evidence on the effects of land-use planning

Despite land-use planning being an established instrument in technical development cooperation, evidence of its impact on the desired socio-economic goals remains scarce. However, the mode of participatory land-use planning is particularly well researched, as is the broader issue of public participation in local decision-making (Chambers, 2007; Hickey and Mohan, 2004).

In their example of Laos, Lestrelin et al. (2011) find that participatory land-use planning (PLUP) does increase the actual participation in the planning process. However, the implementation (and change) of land-use practices fell behind expectation, caused partly by the limited experience and capability of the implementers but also by lack of legitimacy and enforcement. Land-use games and simulations have shown positive effects on the awareness of land-use problems but also on the number of people involved, and the quality of participation, in participatory land-use planning in various research settings (Bourgoin et al., 2012; Bourgoin and Castella, 2011). In particular, participatory Geographic Information System (GIS) analysis and public mappings have proved useful for this kind of awareness building, as Mialhe et al. (2015) demonstrated for their Philippine example. The subsequent translation into behavioural change is commonly not in the scope of the analysis.

Besides the identified mode of implementing land-use planning, contextual conditions have been found to be a determining factor for the success of implementations, as Hessel et al. (2009) demonstrate in their assessment of PLUP in Burkina Faso. The authors specifically stress the necessity of integrating in the planning process both local knowledge and "imported" scientific knowledge. When applied correctly, PLUP can contribute to environmental and ecosystem conservation and harmonize competing land use and land-use conflicts, as a study by the International Institute for Environmental Development – IIEDs (2010) of the PLUP process in Tanzania shows. In the Philippine case, it remains important to consider the local power structures and their influence on the impact of land-use planning interventions. In an evaluation of the KALAHI-CIDDS social service development programme in the Philippines, Labonne (2007) finds that the degree of inequality among a barangay population influences the degree to which barangay captains over-ride community preferences. Thus, the implementation of desired planning and development goals is related to the structure of local decision-making and power.

Furthermore, the enforcement of land-use policy is the crucial link from planning to actual implementation and behavioural change. In their study on forest loss and fragmentation in Ningbo, China, Liu et al. (2016) find land-use planning to be inadequate to protect forest resources due to lagging legislation and adminis-

trative friction between different planning hierarchies and administrations. In line with these findings, Robinson et al. (2005) conclude that land-use planning was unable to restrict low-density development in Seattle's urban fringe. Actors in land-use planning systems often find loopholes in legislation and enforcement. For instance, Kline and Albig's (1999) assessment shows that urban growth concentration policies can lead to the desired outcomes, but that complete compliance with the planning goals was never achieved. While this individual utility-maximization behaviour of land users is rationally understandable it can become socially problematic when, for instance, settlement practices are associated with negative societal externalities. The continuous settlement in risk areas, or the associated negative effects of settlement in protected areas or on fertile agricultural lands, are examples of this conflict. These issues can be observed frequently in the Philippines.

Due to the conflicting and protracted nature of planning in the Philippines, virtually no comprehensive account of the interplay between planning legislation and implementation, compliance and impacts is available yet. This evaluation contributes to fill the lack of existing evidence beyond singular effects, applying a systemic perspective. The tool to approach this task is the comprehensive and reconstructed ToC that was informed by existing scientific evidence and insights from programme documents of the intervention.

After this literature overview of evidence on the effects of land-use planning, we describe in detail the intervention in the Philippines (sections 2.3.3 to 2.3.5) that is the subject of this evaluation, and how it can be compared to other land-use planning interventions by German development cooperation (section 2.4).

2.3.3 Sustainable Integrated Management and Planning for Local Government Ecosystems (SIMPLE)

In the realm of the Philippine–German development cooperation, the technical approach "SIMPLE" for enhanced land-use planning was developed and implemented in selected municipalities in region 6 and 8. Figure 10 (on page 30) gives an overview of the municipalities.

The approach was implemented from 2006 to 2015. By 2012, at the time of the first wave of data collection for this evaluation, 37 municipalities had received the intervention. Between 2012 and 2016, eight of the 63 control municipalities started receiving the intervention and therefore switched from control to intervention group. In total, 44 municipalities directly benefited from the intervention.[9]

SIMPLE is an approach that supports municipalities to engage in comprehensive planning and management of municipal territories, and specifically aimed for an integration of all municipal ecosystems (from ridge-to-reef) as well as for the integration (and planning) for territories beyond the mandate of the municipal administration[10], such as forest lands and coastal areas, usually managed by the DENR[11]. Plan integration or joint planning between the municipality and the responsible national agency rarely took place. For many municipalities in the process of implementing SIMPLE, land-use planning included, for the first time, public land and forest lands within municipal boundaries. It also supported the implementation of national policies at municipal level in the fields of climate change and DRM as well as the Philippine Development Plan 2011–16.

The SIMPLE approach was developed based on experience gained in the implementation of Participatory Land-Use and Development Planning (PLUDP) that was carried out prior to the SIMPLE intervention and aimed at enhancing development planning at barangay level. SIMPLE was a technical approach, which was part of the Natural Resources Governance (NRG) component of the EnRD programme. It aimed at improving land-use planning and disaster risk management (Salzer, 2014). The efforts of the EnRD programme were conducted in cooperation with several government agencies, including the Housing and Land Use Regulatory Board of the Philippine government. The EnRD Programme, implemented by GIZ, which had been in

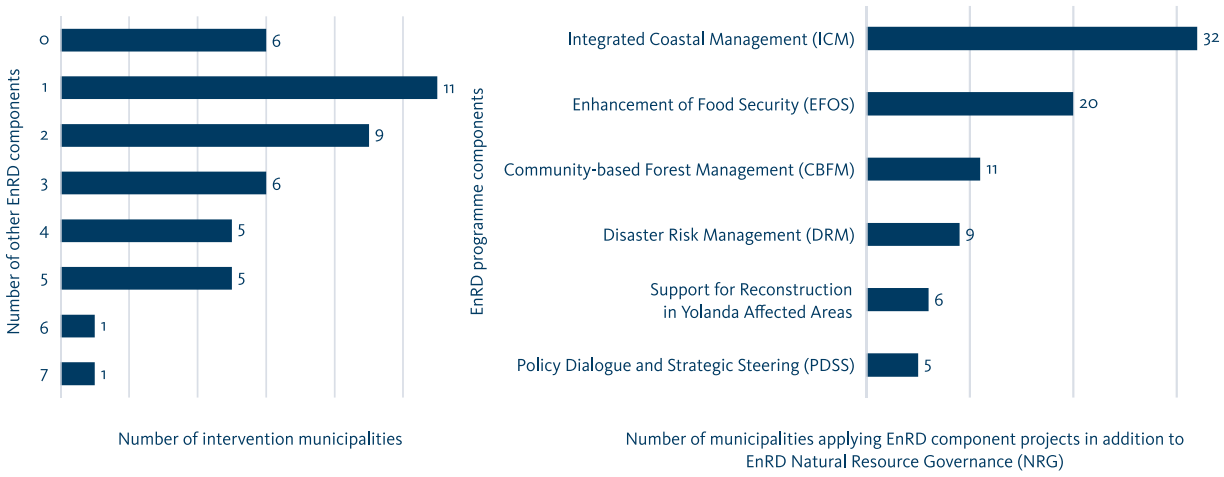
[9] *With 37 municipalities having already received the intervention by 2012, the baseline survey does not have a clean baseline (see also section 3.3.3 for a discussion). In 2015, the size of the intervention group stood at 44 municipalities. In the impact assessment of this evaluation, the intervention group is therefore 44; the size of control group is 56.*

[10] *These encompass, for instance, forest land or ancestral domains (managed by the DENR).*

[11] *In many rural municipalities, up to 50% of the municipal territory is subject to regulation by national agencies, such as public land and forest land which is regulated by the DENR.*

operation since 2005, comprised several components, such as Community-Based Forest Management (CBFM), EFOS, NRG, or DRM. EnRD applied its components selectively among municipalities. Figure 3 demonstrates that most municipalities received between two and three components of the EnRD programme in total, whereas the Integrated Coastal Management (ICM) as well as the EFOS / livelihood component were the most commonly applied components in addition to the Natural Resources Governance (NRG) component. The joint application underlines the complimentary nature of the SIMPLE intervention goals with those of other EnRD components.

Figure 3: Other EnRD projects applied in addition to Natural Resources Governance (NRG / SIMPLE)



Source: Authors' own figure.

Note: The figures are calculated on basis of the intervention municipalities (N=44)

The SIMPLE approach consisted of descriptions of processes, and of instruments for the management of land use, in particular at municipal and barangay level but also stretching to the provincial level. These were complemented by software solutions, guidebooks, and facilitation techniques, as well as capacity development by means of forming a trainer pool to support the municipal and barangay-level implementation. The approach was developed by aggregating experiences from planning and practices that had existed for years in the Philippine–German Cooperation. SIMPLE was structured in five broad phases, as laid out by GIZ (2013):

1. A provincial trainer pool is formed and capacitated in the use of GIS as well as in issuing specialized trainings in thematic project components, such as DRM and plan integration (capacity development).
2. Provincial Development and Physical Framework Plan (PDPFP) programmes, projects and activities are fed into the planning matrices at the municipal level (top-down plan coordination).
3. Comprehensive land-use planning is implemented at the municipal and barangay level. Supported by municipal planning staff, participatory land-use planning activities are prepared at the barangay level in order to develop barangay development plans (BDP). The information derived from the barangay-level plans is then fed into the municipal planning process and consolidated. Information for further sectoral and cross-sectional studies are collected and generated. The CLUP volumes are prepared and submitted to the Provincial Land Use Committee (PLUC) for approval. Significant support was given in the field of development of disaster risk maps and digital cartography.

4. The spatial development perspective of the CLUP is transferred into the formulation of the mid-term Comprehensive Development Plan (CDP). On the basis of the CDP, the local Development Investment Programme is derived, which then forms the foundation for the municipalities' Annual Investment Plans.
5. A monitoring and evaluation plan is developed, which monitors budgets. Expenditures are linked to the spatial planning goals of the CLUP and development planning goals of the CDP. Spatial planning according to the plan is enforced.

Beyond the procedural change, the planning process was further supported by technical inputs, such as risk maps for multiple types of risk (GIZ, 2013).

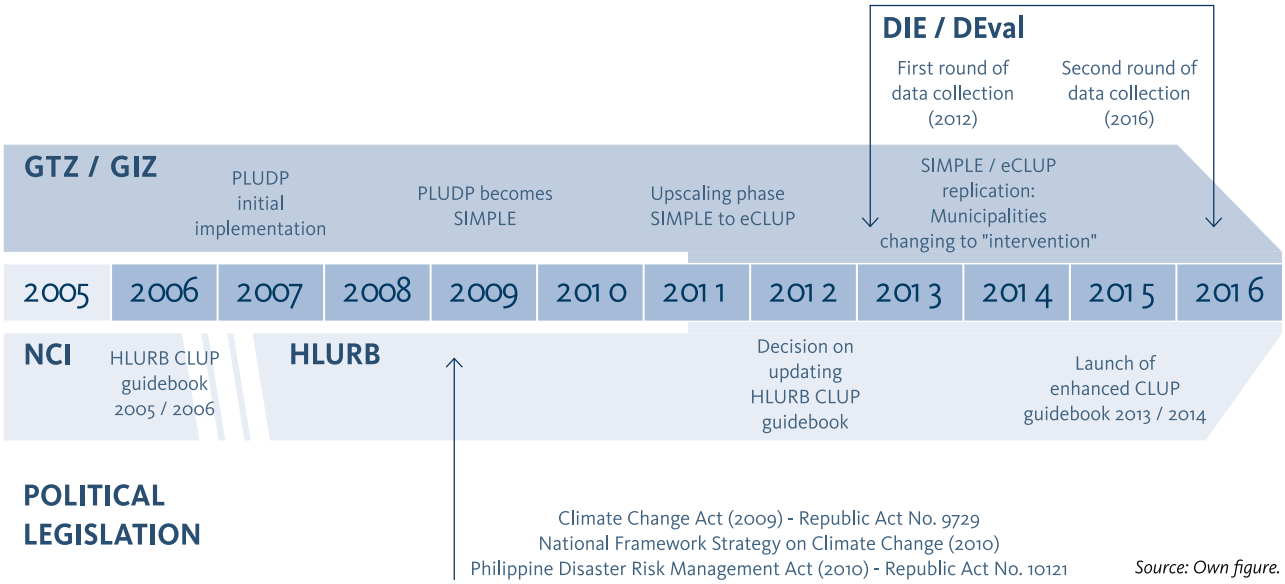
Between 2006 and 2015 the SIMPLE approach was implemented in 44 municipalities in seven provinces. In the duration of the implementation, the intensity of the intervention varied between regions and provinces. Whereas municipalities in Leyte (region 8) mostly received the full intervention in terms of number of trainings and support, municipalities in Panay and Negros Occidental (region 6) received the intervention later and with less intensity related to trainings and technical support. Differences in intensity were also reflected in the number of elements involving participation by local people being conducted by GIZ. Whereas the first municipalities received a comprehensive coverage of participatory measures and events at the barangay level, in later implementations, municipalities received replication of the approach, during which municipal planners were responsible for implementing participatory elements. Due to time and resource constraints, the element of public participation, especially at barangay level, thus became less intensive with the progress of the intervention. Following typhoon Yolanda, additional individual municipalities in region 8 claimed support from GIZ in updating their CLUPs. This support was partially derived from the SIMPLE process; however, these municipalities did not receive a comprehensive intervention and no systematic barangay-level participation was carried out.

2.3.4 Enhanced Comprehensive Land-Use Planning (eCLUP)

The HLURB is the lead agency in the provision of technical assistance to Local Government Units (LGUs) in the preparation of Comprehensive Land-Use Plans. It is also the regulating body of land use, housing development and homeowners associations. After the initial phase of cooperation between GIZ and the National Convergence Initiative (NCI)[12], the HLURB became the main counterpart for the GIZ in their SIMPLE approach. Beyond their cooperation, the agency is responsible for the formulation of new planning policies and guidelines in the Philippines. The National Guidelines on Comprehensive Land-Use Plans (hereafter CLUP guidelines) form the process framework on the development of municipal land-use planning in the Philippines and are mandatory for their implementation. These CLUP guidelines are a procedural framework that supports planners in the preparation of CLUPs, as well as in the updating process of existing plans. The activities of the HLURB and GIZ in the process of formulating and improving planning processes and policy formulation became increasingly interconnected and resulted in a systematic support by GIZ in the drafting and roll-out of the enhanced land-use planning guidelines. The eCLUP guidelines 2013/2014 were officially launched in November 2015. In these guidelines, the HLURB's and GIZ's planning concepts have grown into a comprehensive planning process. In their practical application, the boundaries between content developed by the HLURB itself and content provided by GIZ's SIMPLE approach have increasingly become blurred. The SIMPLE approach thus initially tapped into the existing institutional setting of the existing guidelines, but went beyond the initial scope of the planning process defined in the CLUP guidelines 2006/2007. This made it possible to include an integrated ecosystem approach as well as the ridge-to-reef perspective, as put forward in the SIMPLE process, into the enhanced Comprehensive Land-Use Planning Guidebooks 2013/2014 (DelVecchio, 2015).

[12] *The NCI is an administrative consortium between the secretaries of the Department of Agriculture (DA), the Department of Agrarian Reform (DAR), and the Department of Environment and Natural Resources (DENR). Its main goal is the formulation and development of a common framework for sustainable rural development.*

Figure 4: Chronological perspective on land-use planning concepts



Source: Own figure.

The process of rolling out the enhanced CLUP guidelines and planning approach took place between a GIZ-contracted consultant, GIZ, and the HLURB's Policy Development Group (PDG). The PDG is HLURB's national division for formulating, revising, and updating guidelines and standards for CLUP implementation.

Training and support at the regional level (supporting duties for provincial government as well as municipal planners) were supplied by nine regional field offices. The consultancy concentrated on three major goals: 1) The provision of training management and the conceptualization of the product roll-out; 2) The review of existing training materials with GIZ's SIMPLE concept as well as existing training manuals, modules, and instructions with the HLURB; and 3) The establishment of standards for the design and delivery of training, and its facilitation (DelVecchio, 2015: 3). The developed training syllabus concentrated on in-depth instructions on how to carry out each of the 12 stages of HLURB's eCLUP planning cycle. Specific emphasis was put on integrating the CLUP with other (sectoral and special area) plans.

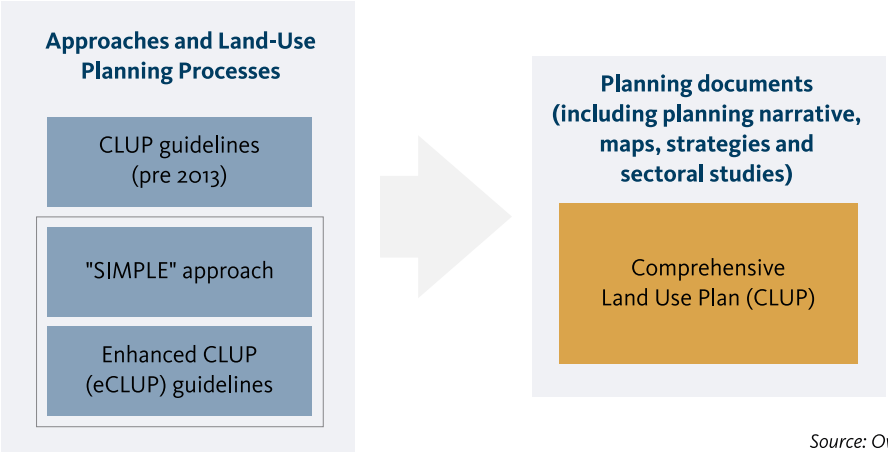
In sum, the SIMPLE approach and eCLUP approach share many similarities. Both provide a process framework for the development of CLUPs. However, one major difference is the non-inclusion of barangay-level planning, which is a result of a legal boundary between the DILG, responsible for development planning at the municipal and barangay level, and the HLURB, responsible for land-use planning.

2.3.5 Recent developments in enhanced land-use planning

With the official launch of eCLUP guidelines in late 2015, supported by GIZ, the activities between GIZ's SIMPLE approach and the HLURB eCLUP guidelines created a common mode of land-use planning that cannot be clearly differentiated in terms of ownership. This process represents a scaling-up of locally tested land-use planning processes at the national level (Salzer, 2014).

Enhanced land-use planning, as described in Figure 5, is the result of both the HLURB and GIZ efforts to enhance land-use planning in the Philippines. Several procedural aspects of SIMPLE were streamlined into the eCLUP guidelines and are now part of the national planning policy. Due to the strong integration of both aspects, and – since 2013 at the latest – the complete entanglement of processes, we decided upon the measurement of *enhanced land-use planning* compared to the SIMPLE intervention alone.

Figure 5: Land-use planning processes and comprehensive land-use plan



Source: Own figure.

2.4 Comparing planning interventions of technical development cooperation

Since land-use planning and land-management interventions are part of the standardized portfolio of interventions in technical development cooperation, it is of interest how the SIMPLE intervention by GIZ relates to similar development interventions in this field. We thus consider projects implemented by GIZ that are related to land management (for instance land consolidation, implementation of cadastral systems), land-use, and environmental planning, and projects related to sectoral topics with implications for the planning system (e.g. disaster risk management planning or CCA).

Interventions of technical development cooperation that are concerned with topics of land-use planning or land management are happening in places with different context conditions and across regions. The overview in Annex 7.3 describes some key characteristics of land-use planning and management interventions in recent years.

Fourteen different countries that were subject to land-use planning and management interventions can be identified. These countries differ considerably in terms of framework condition as well as in the scope of their interventions. As all the presented interventions have been carried out by GIZ, it is not surprising to find substantial overlap in the mode of implementing technical assistance. For instance, the formation of trainer pools and a train-the-trainer approach in technical capacity development, as well as the strong focus on embedding these in support measures for administrative agencies, are characteristics of the considered land-use planning and management interventions. In that sense, the common foundation of the interventions in the working scheme of GIZ experts can explain the observed similarities.

In relation to the thematic scope of the intervention, and the development status of the country context, three main groups of interventions can be differentiated. We identified the following groups when comparing country-context in terms of the current state of socio-economic development and the quality of governance[13] (Figure 6):

- **Land-use management interventions:** Interventions in this group are mostly concerned with activities of technical assistance for the improvement of existing land-use planning and management systems. All countries in this cluster (East- and South-East Europe as well as Peru) share the similarity of relatively stable and mature administrations and are in possession of existing land-use planning and cadastral systems. Interventions are concerned with the upgrading of existing technical

[13] *Human Development Index (Scale 0 = "lowest"; 1 = "highest") / Bertelsmann Stiftung Transformation Index (BTI) – Quality of Governance, Sub indicator 1.4: "To what extent do basic administrative structures exist", (Scale 1 = "lowest", 10 = "highest"). For detailed information methodology refer to: https://www.bti-project.org/en/index/methodology/.*

systems as well as capacity development of planning personnel. These interventions are more specialized and frequently encompass not only rural planning but also urban planning and development components. Substantial socio-economic development goals play a minor role compared to solving specified administrative or technical challenges.

- **Land-use planning interventions:** Interventions in this group are mostly comprehensive land-use planning interventions with a strong component in institutional capacity development (as a solid foundation for the implementation of plans and planning processes). The interventions are usually taking place in an existing institutional setting, characterized by a relative weakness of the involved institutions and agencies. While the planning systems themselves are usually established and formed, their administrative functioning is impaired or the enforcement of planning processes is limited. Main areas for improvement are located in strengthening the institutional capacities and improving the coordination of planning-related agencies (sectoral-plan integration). Furthermore, human capacity development and the introduction of technical planning systems are common. Interventions in this cluster often aim to contribute to long-term development goals, such as reducing poverty or ensuring more sustainable and transparent land use, often in post-conflict or contested land-use environments. The SIMPLE approach of the Philippine–German Cooperation is a prime example of such a land-use planning intervention that resides in a maturing institutional setting coupled with substantial developmental challenges.
- **Rural development interventions:** Interventions in this group are mostly concerned with supporting solutions to immediate conflicts surrounding land-use practices or securing land tenure. The interventions, often strongly participatory and with an explicit focus on local development (mostly at village level), aim to find practical solutions for existing land-use conflicts. Their institutional support component is side-lined and mostly aims to accompany the local goals of the interventions. Due to the country context, they often comprise the initial development or nurturing of planning administrations that were newly established or substantially impaired in their function. In addition, the interventions in this group tend to have a strong emphasis on classic themes of development cooperation, such as the eradication of poverty or the improvement of food security in rural development contexts. The overview demonstrates that while the interventions vary in scale and scope, technical components and improvements in planning capacities can generally only be achieved when the institutional framework conditions are accounted for.

Figure 6: Systematic overview of planning interventions of technical development cooperation

Source: Own figure.

Hence, institutional capacity development and (local) socio-economic development commonly go hand-in-hand. This duality is reflected in the land-use planning interventions of the German technical development cooperation, and illustrates the scope of current land-use planning and management interventions.

The SIMPLE intervention is a typical example for a technical development intervention that couples institutional capacity-building with socio-economic development goals. Tools and measures applied are sufficient to achieve the desired programme outcomes, and seem appropriate, given the complexity of the administrative and institutional structures of the Philippine planning administration. The programme seems well aligned in comparison with other land-use planning interventions in the portfolio of the German technical development cooperation. The overview of programmes shows that participatory planning and development components are crucial to ensuring local ownership and identification of the affected population. While this element is generally considered in the implementation of SIMPLE, it might fall behind in the ongoing upscaling of the programme's efforts into national policy-making. This reduction in focus poses a substantial risk to the sustainability of programme efforts at the local level.

Beyond contextual differences between the portrayed cases, and due to similarities in the way the interventions are structured, recommendations derived from the impact evaluation of SIMPLE seem appropriate for improvement of future land-use planning interventions by German implementation agencies and beyond.

3. EVALUATION DESIGN

3.1 Theory of Change

In this evaluation, we follow a theory-based approach (Chen, 1990), coupled with a quasi-experimental design. In order to identify impact fields, indicators and principal mechanisms suitable for the rigorous impact assessment, it is necessary to understand the conceptual pathways from the outputs of the intervention to the outcomes and, ultimately, to the impacts. For this reason, we reconstructed the Theory of Change (ToC) of the intervention, which also serves as a conceptual framework in our analysis.

In reconstructing the ToC, we followed a multi-step approach. First, we used existing programme documentation on the anticipated outcomes of the SIMPLE approach as part of the NRG component of the EnRD programme (GIZ, 2013; Lange, 2015). We also built upon previous work done for the baseline study of this impact evaluation in identifying anticipated outcomes and impacts of the technical approach beyond the programme documentation (Garcia et al., 2013; Garcia Schustereder et al., 2016). Second, we conducted a thorough literature review on effects of other land-use planning interventions, aligning the ToC with the state of the art. Third, we verified and improved the draft ToC in a pre-study assessment in the Philippines with several consultations and 13 qualitative interviews and focus group discussions (FGDs), which we conducted in the capital and the two intervention regions. In a final step, we discussed and revised the ToC with other researchers. We describe the details of the development process of the reconstructed ToC in the digital annex (section 8).

Since the purpose of this evaluation is an in-depth impact assessment of a technical approach, and not a project or programme evaluation, the indicators and fields in the reconstructed ToC do overlap with results and indicators in the programme documentation, but go far beyond. Since the technical approach SIMPLE for enhanced land-use planning had been developed during the implementation of the EnRD programme, SIMPLE was not an explicit part of the official offer for the EnRD programme by GIZ to BMZ. Thus, the empirical indicators, which we derived from the ToC and operationalized with the empirical data (see chapter 4), differ from the indicators agreed between GIZ and the BMZ (GIZ, 2012, 2014).

The empirical indicators belong to one of the following groups:[14]

a. Indicators related to the official component indicators of NRG, to which the SIMPLE approach belongs;
b. Indicators directly related to the implementation logic of the NRG component;
c. Indicators related to the official indicators of the entire EnRD programme;
d. Indicators related to official capacity development measures of the EnRD programme;
e. Indicators related to official indicators of other EnRD components, such as DRM, CBFM, or CFRM;
f. Indicators that were added during steps 2 to 4 of the reconstruction of the ToC.

In the results section on each of the impact fields, we specify all outcome variables and to which group the indicators belong to (see chapter 4). However, we decided not to give any classification (and thus no explicit weighting) in the presentation and discussion of results. The whole procedure to reconstruct the ToC followed the objective to achieve a holistic impact assessment of a technical approach, without explicitly following programme results and indicators. In this regard, SIMPLE serves as a typical example of a complex technical approach in technical cooperation, suitable to generate evidence for strategic decision-making beyond the single case.

In order to systematically pursue the impact assessment, we developed Output–Outcome–Impact pathways, showing the anticipated effects of enhanced land-use planning. We define outputs as tangible products directly generated from the development intervention itself. In contrast, outcomes are effects that are

[14] *We present the outcome variables for each of the impact fields in detail (see Table 5, Table 8, Table 11, Table 14, Table 19). In these tables, we specifically indicate the relationship of the used indicators with the official documentation of the EnRD programme.*

generated from the initial product and can be understood as interim results, which can only be indirectly influenced by the development intervention. They often depend on behavioural changes. Impacts, on the other hand, are results that cannot be directly influenced by the development intervention, but which are (medium- to long-term) changes triggered by the intervention. For example, these can be changes in living conditions or behavioural changes that achieve the broadest reach and positively affect the population at large.

Figure 7 illustrates the reconstructed ToC with the anticipated effects of enhanced land-use planning. The columns represent the Output–Outcome–Impact pathways. Most indicators at the Output level refer to direct results, products, and activities of the SIMPLE approach or the eCLUP intervention. We distinguish between two levels of outcome: Outcome 1 refers to indirect results of the SIMPLE approach because these indicators require implementation by the capacitated and empowered municipal administrations.[15] The products and activities of the SIMPLE approach can only indirectly influence the results at this stage, as these indicators are still close to the planning activities and administrative level. On the other hand, Outcome 2 includes indicators of effects that can only be achieved if results from Output and Outcome 1 are properly implemented and enforced. The Impact level includes indicators of effects that materialize only in the medium- or long-term, also requiring proper implementation at the stage of Output and Outcome 1.

Across the ToC, we identified five main thematic impact fields and present indicators for each of them: (1) Land-Use Planning and Techniques, (2) (Sustainable) Natural Resource Management, (3) Disaster Risk Management, (4) Local Governance, and (5) Welfare.

As shown above, Outcome 2 and Impact level require an effective enforcement of land-use planning and implementation of planning goals. This is the principal mechanism for transferring results from capacitated and empowered municipal administrations into tangible effects outside the administrative system. In Figure 7, we display this transmission mechanism in the grey box at the top of the ToC, linking the results of Impact field 1 with the other impact fields. We expect a particularly strong link from increased capacity for integrated land-use planning and management to Impact field *2 (Sustainable) natural resource management*. Enforcement mechanisms that are relevant to Impact field 2, for instance, relate to a functioning zoning ordinance (ZO) that is continuously being monitored and one that sanctions misbehaviour. We also expect a strong link to Impact field 4 *Local governance*, as participatory land-use planning aims to involve people in land-use planning, demonstrating both democracy and transparency. Thus, it is not surprising that most official NRG component indicators are defined for Impact field 1, and that several official indicators are also represented in Impact fields 2 and 4.

Indicators in field 1 *Land-Use Planning and Techniques* are located on Output and Outcome 1 levels. They describe the imminent outputs and results of the enhanced land-use planning process and refer mainly to the planning "products" that have been developed following the new and enhanced planning guidelines. They also refer to the increase in technical planning capacities as well as personnel. The intervention products at the municipal level predominantly consist of the enhanced CLUPs that fulfil the requirements of enhanced land-use planning. In turn, we expect an increase in awareness by the municipal population of planning-related topics, such as the presence of zoning officers and zoning ordinance in the municipality.

Anticipated effects in Impact field 2 *(Sustainable) Natural Resource Management* are the definition of protected areas by the municipal administration, or an increase in natural protection and livelihood initiatives. At the household level we expect an increased awareness of activities related to environmental protection, as well as tangible changes by means of an improvement in individual land use and land-use practices in different ecosystems (for instance by a reduced conversion of forest land to agricultural land). These changes in perception and individual behaviour are supposed to be promoted by better public information, and participation in the planning process.

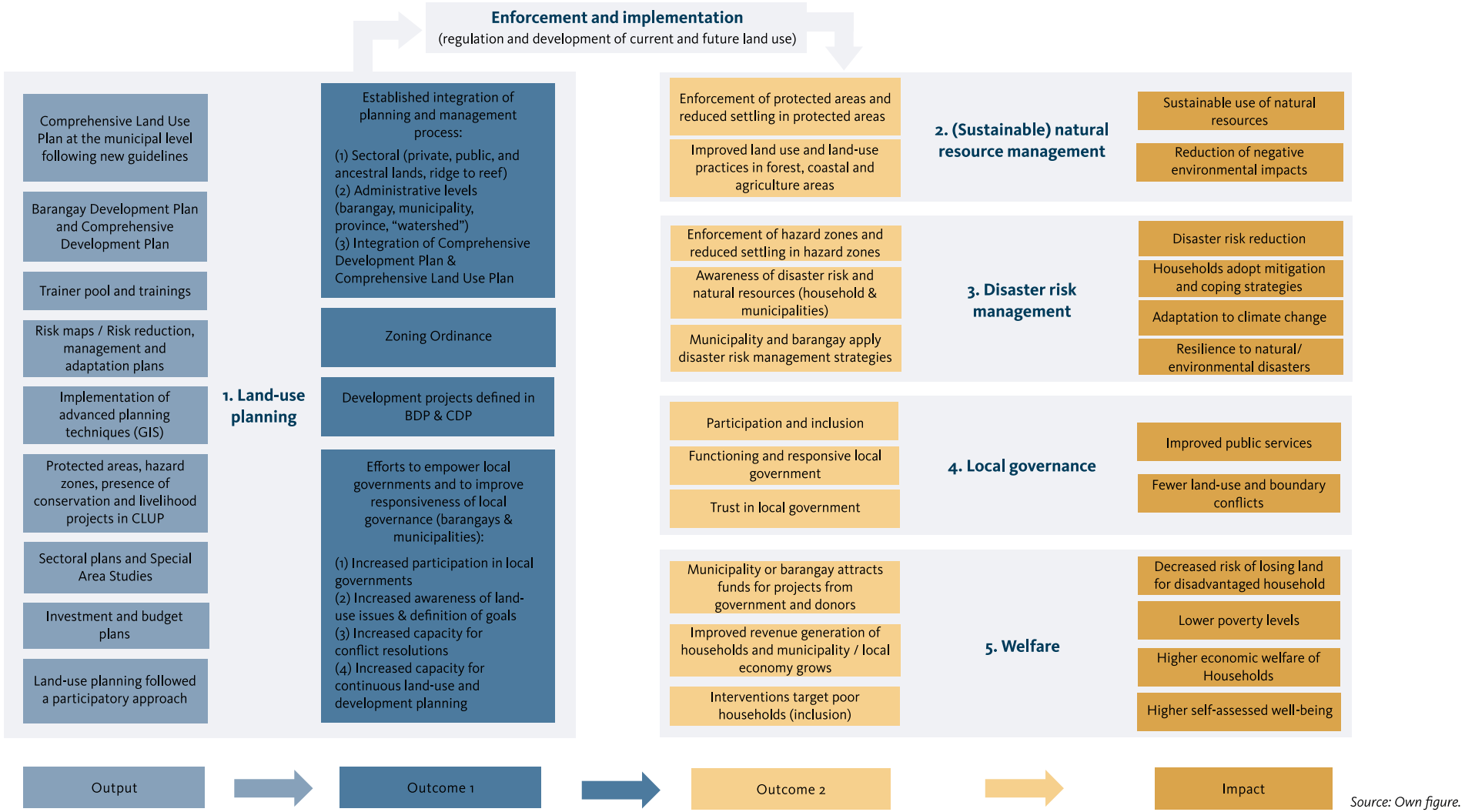
[15] *In terms of enhanced land-use planning in the Philippines, Outcome 1 is located between the Output and Outcome levels. These are outcomes according to the definition of the intervention by the Philippine–German Cooperation, but could be outputs as defined for the local planning authorities and Philippine planning agencies (eCLUP approach).*

In Impact field 3 *Disaster Risk Management*, municipalities and barangays are expected to engage in both infrastructural and technical DRM measures and in measures for shock response. These include community-based measures based on increasing capacity to engage in DRM planning among municipal planners. Furthermore, we hypothesize an improved self-perceived disaster awareness, as well as improved information measures for households when information is transferred from the administrative to the household level. Due to the upcoming climate-change-related planning requirements and a similar specific thematic focus in the intervention, we further anticipate improved awareness of climate-change-related topics.

Impact field 4 *Local Governance* is concerned with the effects of the intervention on governance mechanisms in municipalities. We expect the intervention to improve participation and inclusion of people in local government processes and the performance and responsiveness of municipal governments to cater to people's needs. Due to increasing transparency and public accountability, the intervention is assumed to lead to rising trust among municipal populations. We anticipate that land-use related conflicts to be reduced and better handled by local authorities. Ultimately, we expect an improvement in public services, due to better linkages between public demands, planning and public-service provision.

Lastly, we anticipate the intervention to have improved the welfare and living conditions of the local population (Impact field 5). At the household level, increased awareness of disaster risks, and the presence of development and livelihood projects, are expected to positively influence households' perception of public-service provision as well as contributing to an improved income situation. While immediate income can be generated from employment surrounding projects, increasing security of assets are expected by improvements in public DRM. Both increased household income and employment situation, as well as the improved financial situation at the barangay level, are expected to contribute to an improvement in overall welfare and to a reduction of poverty.

Figure 7: Reconstructed Theory of Change



Source: Own figure.

3.2 Evaluation questions

We derive the specific evaluation questions from the evaluation objectives (section 1.2) and from the reconstructed ToC presented in the previous section (section 3.1).

The questions we derived from the ToC relate to the evaluation objectives on the *effectiveness* and *impact* of the enhanced land-use planning intervention. In line with the ToC, we expect that the intervention may lead to effects at Output, Outcome, and Impact level in the following five impact fields:

1. Land-Use Planning (Output and Outcome 1)
2. (Sustainable) Natural Resource Management (Outcome 2 and Impact)
3. Disaster Risk Management (Outcome 2 and Impact)
4. Local Governance (Outcome 2 and Impact)
5. Welfare (Outcome 2 and Impact).

Two cross-sectional topics beyond single impact fields address the main criteria *relevance* and *sustainability*. Regarding relevance, we assess:

- The consistency with current development agendas.
- Contribution of land-use planning to the Sustainable Development Goals.

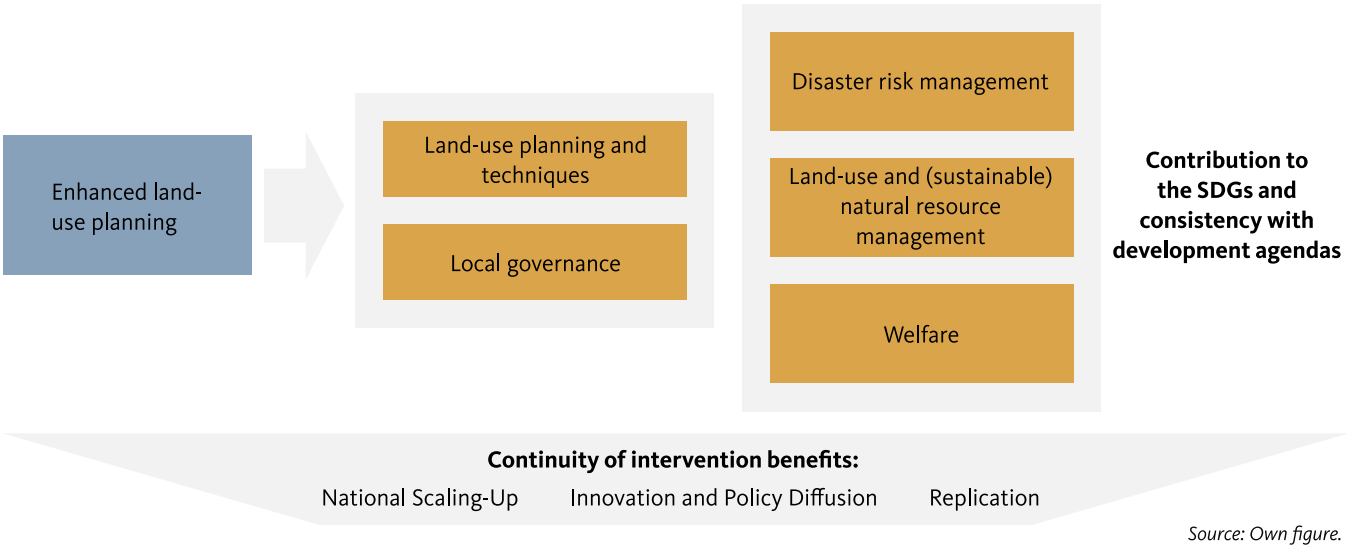
Regarding the sustainability of the approach, we assess the continuity of intervention benefits and examine particularly:

- The scaling-up of local approaches to national level.
- Innovation and policy diffusion of intervention processes and outputs.
- Aspects related to the replication of the approach.

Since encouraging learning from previous interventions is at the centre of any evaluation, we additionally emphasize several lessons for strategic planning of future implementations. Figure 8 gives a systematic overview of the fields addressed by the evaluation questions and shows how they are embedded in the ToC.

The evaluation questions for each of the impact fields are as follows. Additionally, we present the sub-questions for each of the impact fields in Text box 1.

Figure 8: Simplified Theory of Change and evaluation objectives



Source: Own figure.

- Impact Field 1: To what extent and in what ways did the intervention improve land-use planning practices and techniques?
- Impact Field 2: To what extent and in what ways did enhanced land-use planning lead to an actual change of land use and (sustainable) natural resource management?
- Impact Field 3: To what extent and in what ways did enhanced land-use planning improve DRM?
- Impact Field 4: To what extent and in what ways did enhanced land-use planning improve local governance?
- Impact Field 5: To what extent and in what ways did enhanced land-use planning lead to improved welfare?

Additionally, we present main results on the questions referring to cross-sectional topics:

- Cross-sectional Topic 1: What are relevant findings with regard to the sustainability of the intervention and the continuity of intervention benefits, particularly with regard to *innovation diffusion, scaling-up and replication* of land-use planning processes?
- Cross-sectional Topic 2: To what extent is enhanced land-use planning consistent with development agendas, and in what ways does enhanced land-use planning contribute to the *SDGs*?

Text box 1: Evaluation sub-questions for the five impact fields

Evaluation sub-questions for the five impact fields

IF1: Land-use planning practices and techniques

- **IF1a:** To what extent did the intervention improve planning of land use?
- **IF1b:** To what extent did the intervention change the availability of skilled planning staff and techniques?
- **IF1c:** To what extent did the intervention lead to the integration of plans from barangay to municipal and provincial level?
- **IF1d:** What are the determinants of a successful implementation of enhanced land-use planning?

IF2: (Sustainable) natural resource management

- **IF2a:** To what extent did enhanced land-use planning lead to actual change in land use and sustainable use of natural resources?
- **IF2b:** To what extent did enhanced land-use planning lead to an increase in the definition of protected areas and to an increase in the availability of livelihood programmes?
- **IF2c:** To what extent did enhanced land-use planning lead to higher awareness of protected areas and better enforcement of protected areas?

IF3: Disaster Risk Management

- **IF3a:** To what extent did enhanced land-use planning lead to implemented and functioning disaster risk reduction and management strategies of municipalities, barangays, and households?
- **IF3b:** To what extent did enhanced land-use planning increase awareness of hazard zones and reduce settling in hazard zones?
- **IF3c:** To what extent did enhanced land-use planning increase adaptation capacities to climate change?

IF4: Local governance

- **IF4a**: To what extent did enhanced land-use planning increase participation in local government?
- **IF4b**: To what extent did enhanced land-use planning increase the functioning and responsiveness of local governments?
- **IF4c**: To what extent did enhanced land-use planning increase citizens' satisfaction and trust in local governments?
- **IF4d**: To what extent did enhanced land-use planning lead to improved provisioning of public services and infrastructure?
- **IF4e**: To what extent did enhanced land-use planning decrease conflicts and improve the handling of conflicts?

IF5: Welfare

- **IF5a:** To what extent did enhanced land-use planning decrease the risk of losing land, especially for disadvantaged households?
- **IF5b:** To what extent did enhanced land-use planning increase economic welfare at household level?
- **IF5c:** To what extent did enhanced land-use planning decrease poverty?
- **IF5d:** To what extent did enhanced land-use planning increase self-assessed well-being?

3.3 Design of rigorous impact assessment

To evaluate the effects of enhanced land-use planning, we followed a three-step mixed-methods approach (see Figure 9). First, to reconstruct the ToC and to inform questionnaire development, we applied literature review, document analysis, and qualitative interviews. Second, we conducted a rigorous impact assessment in the form of a quasi-experimental design. The impact assessment integrated survey data from households, barangays, and municipalities as well as geographical data, for example on hazards and household location. Additionally, we assessed CLUP plans in a comprehensive document analysis.

In a third step, we drew on qualitative interviews and FGDs to contextualize and interpret quantitative results, to substantiate causal mechanisms, and, if hypothesized effects were not found, to identify reasons.

3.3.1 Quasi-experimental evaluation approach

The goal of an impact evaluation is to measure the effect of an intervention on one or more outputs, outcomes, or impacts, and to attribute them to the intervention. An impact evaluation therefore tries to find out what would have happened without the intervention. This hypothetical situation is called a *counterfactual* to the intervention.

Since the same household, barangay, or municipality can never be observed in both states, i.e. receiving the intervention and not receiving the intervention, a counterfactual cannot be directly observed. An appropriate control group is needed to approximate the counterfactual.

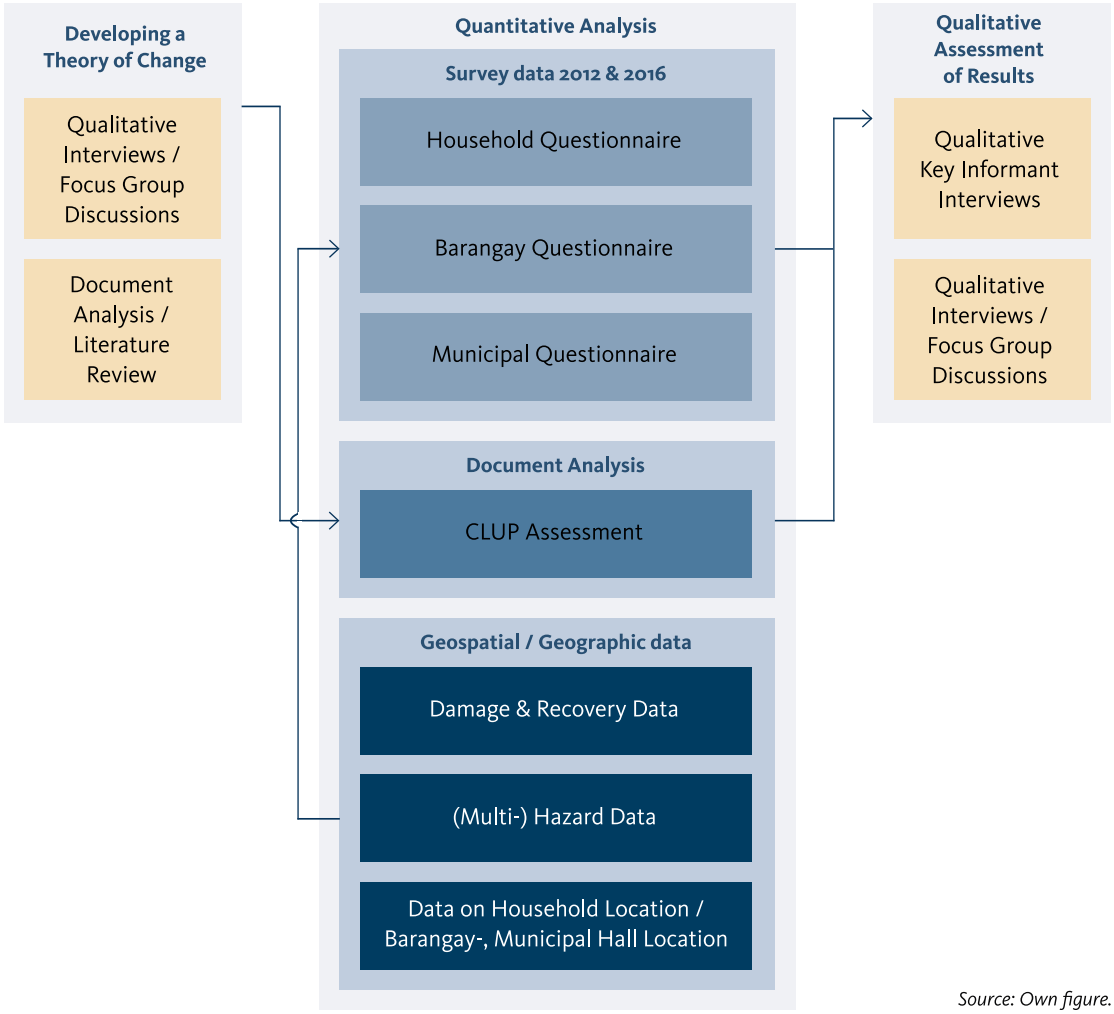
One way to do so is to conduct a random experiment. In experiments, the intervention is randomly assigned to the *intervention* group while the *control group* does not receive the intervention. Due to the random allocation of the intervention, both groups (if the sample size is large enough) do not systematically differ regarding observed and unobserved characteristics. The only difference between them is the intervention.

In the case of this evaluation, the intervention was not randomly assigned – a situation often found when evaluating development cooperation. The opportunity to participate in the intervention was unevenly distributed among municipalities. This leads to selection bias. The intervention and control group might systematically differ. If the characteristics in which both groups differ correlate with the outcome of interest, the difference in outcomes cannot be clearly attributed to the intervention. In this case, quasi-experimental methods provide a viable alternative to measure the effect of an intervention. Most suitable to our setting, we applied *Propensity Score Matching (PSM)*, which tries to statistically mimic random sampling of intervention and control, and by constructing a control group that is – before the intervention – as similar to the intervention group as possible.

(Quasi-) Experimental designs are most robust if they compare intervention and control groups before and after the intervention (baseline and endline) (Shadish et al., 2002). Hence, we collected data on municipalities with and without intervention at two points of time. We used the first round of data collection to balance intervention and control group for each outcome variable and administrative level. For those outcome variables available in both rounds of data collection, we used PSM with lagged outcome variables (Lechner, 2011), by which the outcome of the baseline was included in the matching procedure. This ensures that control and intervention group are also similar in regard to the outcome at baseline. Annex 7.1.1 and 7.1.7 provide a detailed explanation of the methodological approach.

The impact of the intervention (average *treatment effect* on the treated, ATT) is calculated as the difference of average outcomes between groups. Consequently, the treatment effect always has to be interpreted in relative terms. It describes how the value of the outcome variable of the intervention group differs from the control group.

Figure 9: Flow chart of mixed-methods strategy



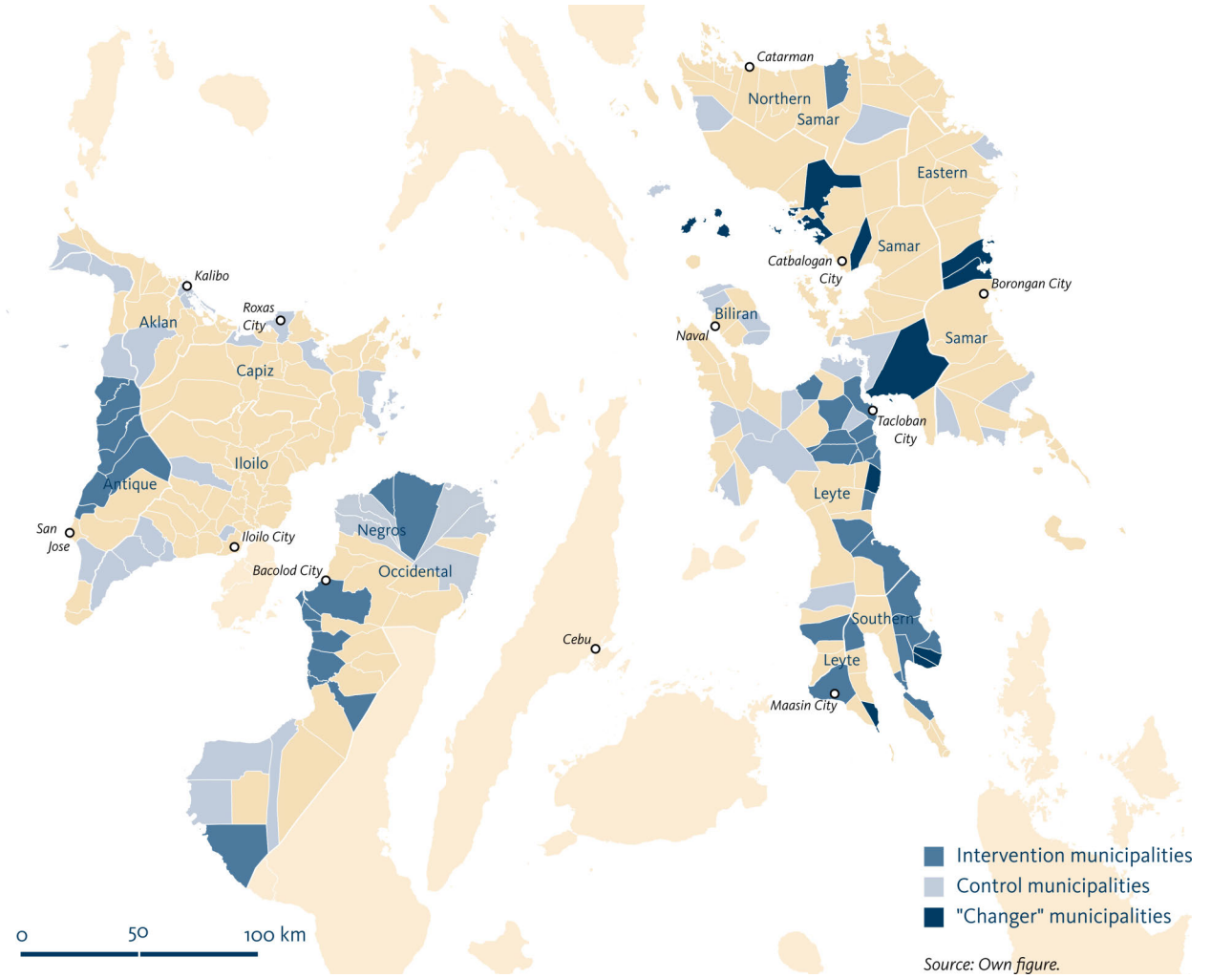
Source: Own figure.

3.3.2 Survey data

Data on municipal, barangay, and household level was collected in 2012 and 2016, resulting in a sample of 3,000 households, 300 barangays, and 100 municipalities in 2012. The intervention had been implemented only in region 6 and 8. For the intervention group, all 37 municipalities that had received the intervention before 2012 were included in the sample. The sample was complemented with 63 comparable control municipalities in the same regions (see Table 2). Information on the selection of those municipalities (as well as barangays and households) can be found in Annex 7.1.

As the SIMPLE approach was implemented from 2006 to 2015 and the first wave of data has been collected in 2012, the baseline is not “clean” (see also section 3.3.3 for a discussion). Between 2012 and 2016, eight of the 63 control municipalities started receiving the intervention and therefore switched to the intervention group. The size of the intervention group is therefore 44, the size of the control group is 56. Figure 10 shows a map of municipalities in the control and intervention groups, as well as the municipalities that switched from one to the other.

Figure 10: Map of survey area



Within each municipality, we surveyed three barangays, and in each barangay 10 households. In 2016, the same municipalities, barangays, and households were visited again. The attrition rate was relatively low for the time gap of four years between data collection rounds and typhoon Yolanda.[16] Global Positioning System (GPS) coordinates were taken for all respondents to allow geographical analysis. We present details on the sample in Table 2. Data collection was conducted in collaboration with universities in the Visayas. Interviews were conducted face-to-face. In 2012, the data collection was conducted using pen and paper questionnaires; in 2016, we used tablet computers. In 2016, the team conducted an evaluation capacity development component with the two involved universities, consisting of several trainings on digital data collection.

3.3.3 Methodological challenges

The evaluation design addresses five methodological challenges:

Typhoon Yolanda

First, parts of the study area in region 6 and 8, were severely affected by typhoon Yolanda (also known as Haiyan) in November 2013, leading to destruction in many of the sampled municipalities. Disentangling the

[16] *The term "attrition rate" refers to the percentage of surveyed units that could not be revisited in the second round of data collection. Reasons are usually that the household moved away, was deceased, or could no longer be found. The number of refusals was negligible.*

effects of *enhanced land-use planning*, on the one hand, from the destruction caused by Yolanda and increased reconstruction efforts after Yolanda, on the other hand, is a challenge to the evaluation. To address this challenge, we use geographical data (see section 7.1.3).

Table 2: Sample size of survey data and CLUP assessment

Type of instrument	Survey 2012	Survey 2016	Attrition rate
Household survey	3,000	2,740 (2,669 panel)	11.03%
Barangay survey	300	300	0%
Municipal survey	100	100	0%
CLUP assessment	-	84 valid CLUP documents	0%

Source: Own calculation.
Note: Households in survey 2016 include 71 cases of resampled households; number of households with panel data in brackets.

Timing of baseline

Second, the first wave of data was collected in 2012 after the intervention had started. This did not, however, lead to major problems in the impact evaluation since effects mainly manifest in the longer-term, as intended by the project and confirmed in expert interviews. If, however, the intervention takes effect in the short-term, we might underestimate effects. Hence, we added the subgroup "intervention after 2012", which includes only those municipalities with a clean baseline, as a robustness check. Exclusively drawing on these proves difficult due to the small number and a changing intervention over time (see section 3.3.4).

Changing intervention

Third, enhanced land-use planning is a moving target. The intervention of the Philippine–German Cooperation started in 2006 and was under constant change; the HLURB eCLUP guidelines 2013/2014 were phased in after 2013 and officially launched at the end of 2015. Therefore, the intervention might vary between municipalities. Consequently, resulting CLUPs might have been of different quality, and the participation process might have been of different intensity. We use two indicators to identify changes in intervention: (a) the number of trainings and (b) the year the intervention took place. In particular, we found large differences in the intervention implemented before and after 2012. To address the challenge of changing intervention, we isolated effects on intervention municipalities receiving a high number of trainings, and differentiated intervention municipalities with intervention before and after 2012 (see section 3.3.4). To counteract this challenge, the evaluation design includes a sub-study on the quality of CLUPs (see section 0), where we develop a composite score of subjective usability based on the assessment of trained supervisors.

Other interventions and projects

Fourth, *enhanced land-use planning* is not the only intervention in the study area. Attributing effects to *enhanced land-use planning* intervention requires controlling for other interventions. This includes other EnRD components, other interventions of the Philippine–German Cooperation, other Philippine interventions, as well as interventions of other donors. The region had a strong influx of aid during the time of the evaluation, in particular after typhoon Yolanda. Two strategies allow the isolation of the effect on enhanced land-use planning: (1) Information on projects of other donors is included in the PSM; (2) two different sets of intervention and matching variables were used in the models to deal with additional EnRD measures (see section 3.3.4).

Table 3: Overview of treatment variables

	Description	Intervention sites	Control sites	Total
1) Enhanced land-use planning (enh. LUP)	Enhanced land-use planning intervention versus controls. Effects of other EnRD components in control sites are controlled in PSM.	44	56	100
2) enh. LUP + EnRD	Enhanced land-use planning intervention versus controls without GIZ interventions.	44	31	75

Diffusion

Fifth, diffusion of innovations might bias the results of the control group. In principle, diffusion is a positive result of any development intervention, as it increases the number of beneficiaries. Knowledge about enhanced land-use planning spreads to control municipalities due to the fact that trainers moved beyond intervention municipalities, as well as due to knowledge exchange between officers from intervention and control municipalities.

However, positive effects of the intervention on municipalities in the control group violates assumptions of quasi-experimental designs. Consequently, diffusion might lead to an underestimation of effects. To reduce biases in the estimation of the treatment effect, we estimated a diffusion model and included its results in the econometric models (see Annex 7.1.5 and section 3.3.4).

3.3.4 Treatment variables and sub-group analyses

We derived the definition of treatment variables from information provided by the Philippine regional GIZ office and GIZ project documentation. Differentiating enhanced land-use planning from other EnRD components proved difficult as the former was usually not applied exclusively (see section 2.3.3). To differentiate enhanced land-use planning from other EnRD components, we calculated two treatment indicators (Table 3):

Treatment variable 1 (**“enh. LUP”**) comprises all municipalities that received *enhanced land-use planning*, i.e. SIMPLE and eCLUP. The remaining municipalities are treated as control. Since some control municipalities received other EnRD components, we controlled for the effect of these other component projects in the propensity score matching. Treatment variable “enh. LUP” thus allows us to approximate the pure effects of the **enhanced land-use planning component**. While conceptually convincing, this approach proved difficult to implement in some PSM models due to the strong correlation of EnRD and enhanced land-use planning.

Treatment variable 2 (**“enh. LUP + EnRD”**) does not differ from Treatment variable 1 with regard to the intervention group. However, municipalities that received other EnRD component projects were excluded from the control municipalities. This variable thus allowed us to infer the effects of **enhanced land-use planning plus other EnRD component projects** against municipalities untreated by GIZ interventions. The scope of this secondary variable is thus broader, and we expect stronger outcomes and impacts compared to variable 1. Additionally, the matching procedure is simplified. Each model is calculated for both treatment variables.

Table 4: Qualitative interviews and focus group discussions

Group	Description	No. of interviews	Type	Description
HH	Households	6	FGD	2 FGDs in control municipalities (marked with C, otherwise I). 5 participants. Sampling based on results from the survey.
BC	Barangay captains	4	FGD	2 FGDs in control municipalities (marked with C, otherwise I). 5 participants. Sampling based on results from the survey.
MP	Municipal planning staff	20	Interview	8 interviews in control municipalities (marked with C, otherwise I) Sampling based on results from the survey.
PP	Provincial planning staff	6	Interview	Sampling based on results from the survey.
DA	Development agencies	7	Interview	Respondents from GIZ Germany and Philippines.
GA	Government agencies	12	Interview	Respondents from DA, DAR, DILG, HLURB, NEDA, NCI, DENR, FMB.
CS	Civil society organizations	7	Interview	Respondents from local NGOs concerned with land-use planning topics.
RS	Researcher / Senior experts	3	Interview	Respondents from academia and other senior experts.

We calculated several modifications of the propensity score matching models. First, models were calculated on different administrative levels: municipality, barangay, and household. Second, to compare treatment effects under different conditions, we not only analysed the full sample, but also divided the sample into sub-groups. In the municipal and barangay models, we applied the following additional sub-groups:

a) All municipalities with a high training intensity

b) Only municipalities in which the intervention had already started before 2012

c) Only municipalities that received the intervention after 2012 and were previously assigned to the control group (switchers).

At the household level, we computed three additional models:

d) Separately for region 6 and 8

e) Only households that actively participated in society and politics (at the time of 2012).

Additionally, we calculated models with diffusion-corrected controls, but we decided not to report this additional sub-group as it did not lead to substantial changes from the full sample.

For subgroup (a), only municipalities with high training intensity (more than five trainings) were kept in both intervention and control group. High training intensity is one of the indicators for a changing intervention. Similarly, subgroup (c) “intervention before 2012” controls for changes in the intervention. All other intervention municipalities were dropped from the sample. Qualitative interviews showed that the intervention changed strongly over time, and that the intervention implemented after 2012 was observably weaker in terms of participation and trainings.

Subgroup (c) comprises only municipalities with intervention after 2012. These provide a clean baseline, and counteract underestimation due to effects evolving in the short-term. However, the municipalities in this group also received a weaker intervention. To construct a proper counterfactual, only controls from region 8 were used.

At the household level, effects for region 6 and 8 were additionally separated to take account of the importance of contextual factors. For barangay and municipality, this separation was not possible due to reduced sample size.

Further, subgroup (e) only included politically active households, i.e. households attending barangay councils or which were members of community organizations (index, described in annex 7.2) as these might have better access to information on land-use planning and therefore be expected to experience larger effects.

Lastly, a subgroup of diffusion-corrected municipalities was calculated. For this subgroup, all control municipalities identified as gaining from diffusion (see section 4.7) were dropped. The results did not, however, differ from the total sample models, so this subgroup is not reported in the results chapter.[17]

3.3.5 Qualitative methods: key informant interviews and focus group discussions

Qualitative methods complement the evaluation at two points. First, we conducted key informant interviews and FGDs in Leyte (region 8), Panay (region 6), and Manila in order to verify the ToC and to inform questionnaire development for household and barangay, and for the Municipal Planning and Development Officer (MPDO) survey, as well as for the design of the assessment of CLUPs.[18]

Second, we conducted qualitative interviews and FGDs to contextualize and interpret results of the quantitative study, to identify local contextual factors affecting programme implementation, and to analyse how the intervention is embedded in the administrative and governmental framework. To include different points of view, a broad range of organizations and survey participants was interviewed. Interviews were conducted in municipalities with unusually strong or weak results regarding implementation of enhanced land-use planning. In total, 65 interviews and FGDs have been conducted during the second phase, details are given in Table 4. The interviews were audio-recorded, transcribed, systematically coded using the software MaxQDA, and were subject to a qualitative content analysis.

[17] *Results can be found in the digital annex, section 8.*

[18] *See section 3.1 on the reconstruction of the Theory of Change. Qualitative interviews included seven semi-structured interviews with experts involved in the implementation of SIMPLE, one focus group discussion with municipal land-use planners, and three focus group discussions with barangay officials involved in the planning process.*

4. RESULTS

4.1 Overview of impact fields and cross-sectional topics

In the process of reconstructing the Theory of Change of enhanced land-use planning interventions in the Philippines (see section 3.1), we developed five thematic impact fields. For each of them, we computed the effects of the intervention on several indicators. In the presentation of results, we systematically follow the structure laid out in section 3.2. First, we address the questions concerning the *effectiveness* and *impact* of the intervention, presenting the results from the five impact fields in sections 4.2–4.6. In these sections, we answer the following main questions:

Impact field #1 (section 4.2) measures the effects on *Land-Use Planning* with indicators of Output and Outcome 1. In this impact field, we address the main question:

> *To what extent and in what ways did the intervention improve land-use planning practices and techniques?*

The indicators of the four other impact fields measure effects on indicators of Outcome 2 and Impact. Impact field #2 on (Sustainable) Natural Resource Management addresses the main question (section 4.3):

> *To what extent and in what ways did enhanced land-use planning lead to an actual change of land use and (sustainable) natural resource management?*

Impact field #3 measures several indicators of DRM of Outcome 2 and Impact. In section 4.4, we address the main question:

> *To what extent and in what ways did enhanced land-use planning improve DRM?*

Impact field #4 measures the effects on local governance indicators of Outcome 2 and Impact. We address its main question in section 4.5:

> *To what extent and in what ways did enhanced land-use planning improve local governance?*

In Impact field #5, we present several indicators measuring the effect on welfare indicators of Outcome 2 and Impact at municipal, barangay, and household level. We address the following main question in section 4.6:

> *To what extent and in what ways did enhanced land-use planning lead to improved welfare?*

In the subsequent sections, we address the *sustainability* and *relevance* of the enhanced land-use planning interventions. We address the following main question on the *sustainability* of the intervention in two subsections, starting with an analysis of policy and innovation diffusion (section 4.7) and continuing with an analysis of the national scaling-up and continuity of intervention benefits in section 4.8:

> *What are relevant findings with regard to the sustainability of the intervention and the continuity of intervention benefits, particularly with regard to innovation diffusion, scaling-up, and replication of land-use planning processes?*

In section 4.9 we address the main question concerning the relevance of the intervention in terms of their consistency with development agendas and the sustainability in the sense of the sustainable development agenda:

> *To what extent is enhanced land-use planning consistent with development agendas and in what ways does enhanced land-use planning contribute to the SDGs?*

4.2 Impact Field 1: "Land-Use Planning"

4.2.1 Description of impact field

The impact field "Land-Use Planning" is concerned with the immediate results and outcomes of the enhanced land-use planning intervention. Following the training and capacity development conducted at provincial level, carried out by GIZ and HLURB, provincial support staff assisted and capacitated municipal planning and development officers.

Besides institutional trainings in plan formulations, technical assistance was given in GIS-based cartography, data collection and consolidation, and barangay-level plan integration and participation.

Following the ToC, municipal planners are supposed to be capacitated by the intervention to develop comprehensive, inclusive, and consistently high-quality CLUPs. Furthermore, the intervention is supposed to equip planning administrations with skilled technical personnel to support the development of new CLUPs and to enhance land-use planning and enforcement practices. This increase in planning capacity is supposed to increase awareness of the importance of effective land-use planning and enforcement.

4.2.2 Evaluation questions and operationalization

To examine the effects of enhanced land-use planning on the above-mentioned outcome variables summarized by the question: "To what extent and in what ways did the intervention improve land-use planning practices and techniques?" we address the following evaluation questions:

- **IF1a:** To what extent did the intervention improve planning of land use?
- **IF1b:** To what extent did the intervention change the availability of skilled planning staff and techniques?
- **IF1c:** To what extent did the intervention lead to the integration of plans from barangay to municipal and provincial level?
- **IF1d:** What are the determinants of a successful implementation of enhanced land-use planning?

While question IF1a to IF1c are answered mainly using quantitative data, IF1d mostly relies on cross-cutting analysis and results obtained in the qualitative contextualization. Table 5 presents the empirical indicators used to answer the above-mentioned evaluation questions.

Indicators measuring the comprehensiveness and thematic coverage of topics in CLUPs were derived from the document analysis of CLUPs and related planning documents in both intervention and control sites as well as from the municipal survey. Indicators measuring the populations' awareness of planning documents and practices are derived from the household questionnaire. We show the indicators, including descriptive statistics, in Table 5. Due to changes in the survey design and coverage between data collection, most results in this impact field can only be derived using outcome data from 2016.

4.2.3 Results and discussion

In Table 6 we present the indicators on the quality of CLUP planning documents as well as the availability of technical planning staff in the municipal planning administration. Beyond the analysis of the total sample, we analyse the specific outcomes in municipalities with high training intensity (more than nine GIZ or HLURB trainings received), only municipalities receiving the intervention after 2012 (lower intervention intensity) and those receiving the intervention before 2012 (full intervention intensity).

The results of the econometric analysis suggest that eCLUP, in combination with other EnRD programme components, did improve the planning of land use in municipalities. Municipalities receiving the intervention show a higher comprehensiveness of the three volumes of their CLUPs as well as better perceived usability of planning documents. Furthermore, CLUPs that were developed through the enhanced land-use

planning intervention and other EnRD components, show a significantly higher rate of approval by the Provincial Land-Use Committee (PLUC). Critical topics, such as natural hazards, DRM, and the effects of global climate change, are covered significantly more often in CLUPs of intervention municipalities. The observed positive effects are systematically stronger when controlling for the number of trainings received during the intervention. Municipalities that received a high number of trainings during the intervention show a higher treatment effect on plan comprehensiveness, plan usability, and thematic coverage in vital topics. However, the analysis further shows that enhanced land-use planning alone was able to contribute to these improvements. If municipalities also received support through other EnRD interventions, positive effects were more likely.

Table 5: Outcome variables for Impact field 1

Eval. questions	Level	Indicator	Description	Relation to EnRD indicators	Unit	Mean 2012	Mean 2016
IF1b	Municipality	Zoning officer	MPDO reported on presence of zoning officer in municipal planning administration	NRG_{Impl}	1 – yes, 0 – no.	M: 0.788	M: 0.723
IF1a	Municipality	Zoning Ordinance	MPDO reported on presence of zoning ordinance in municipal planning administration	NRG_{Impl}; NRG indicator 2	1 – yes, 0 – no.	M: 0.870	M: 0.869
IF1b	Municipality	GIS expert	MPDO reported on presence of GIS expert in municipal planning administration	NRG_{Impl}, $EnRD_{CD}$	1 – yes, 0 – no.	-	M: 0.510
IF1a	Municipality	CLUP - approval	Approval of CLUP by PLUC	NRG indicator 2	1 – yes, 0 – no.	-	M: 0.370
IF1a	Municipality	CLUP - usability	Subjective score of usability of CLUP documents based on a qualitative assessment by trained enumerators (4 equally weighted sub indicators (1 – low; 10 high) on usability and comprehensiveness of information in CLUP documents.	NRG indicator 2	1 – low, 10 - high	-	M: 5.06 (2.92)
IF1a	Municipality	CLUP – Vol.1 comprehensiveness	Comprehensiveness of Volume 1 (Comprehensive Land-Use Plan)	NRG indicator 2 (utilization of results)	1 – yes, 0 – no.	-	M: 0.418
IF1a	Municipality	CLUP – Vol.2 comprehensiveness	Comprehensiveness of Volume 2 (Zoning Ordinance)	NRG indicator 2 (utilization of results)	1 – yes, 0 – no.	-	M: 0.500
IF1a	Municipality	CLUP – Vol.3 comprehensiveness	Comprehensiveness of Volume 3 (Sectoral- and Special Area Studies)	NRG indicator 2 (utilization of results)	1 – yes, 0 – no.	-	M: 0.510
IF1a	Municipality	CLUP – participatory development	Full participatory development of CLUP (Process information and public hearing)	NRG indicator 2	1 – yes, 0 – no.	-	M: 0.561
IF1c	Municipality	CLUP – barangay integration	Integration of information from barangay-level plans	NRG_{Impl} (NRG indicator 3)	1 – yes, 0 – no.	-	M: 0.643

Eval. questions	Level	Indicator	Description	Relation to EnRD indicators	Unit	Mean 2012	Mean 2016
IF1a	Municipality	CLUP – natural hazards	Management of natural hazards is covered in CLUP documents	DRM indicator 4	1 – yes, 0 – no.	-	M: 0.622
IF1a	Municipality	CLUP – climate change	Effects of climate change is covered in CLUP documents	DRM indicator 6	1 – yes, 0 – no.	-	M: 0.551
IF1a	Household	Heard of ZO	Have you heard of a zoning ordinance?	Related to EnRD indicator 1	1 – yes, 0 – no.	H: 0.313	H: 0.364
IF1a	Household	ZO in municipality	Is there a zoning ordinance in your municipality?	Related to EnRD indicator 1	1 – yes, 0 – no.	H: 0.265	H: 0.336
IF1a	Household	ZO enforced	Does the local government enforce the zoning ordinance?	Related to NRG indicator 2	1 – yes, 0 – no.	H: 0.235	H: 0.316

Note: Standard deviation in parentheses. Household-level descriptives and models only include municipalities with existing ZO. N is therefore reduced to 2610 in 2012 and 2360 in 2016. ° The relationship of empirical indicators with EnRD programme indicators as agreed with the BMZ has the following specifications: NRG = Indicator related to official NRG / SIMPLE component indicators; NRG_{Impl} = Indicator directly related to implementation logic of NRG; EnRD = Indicator related to official indicators of entire programme; $EnRD_{CD}$ = Indicator related to capacity development measures of EnRD programme; DRM/CBFM/CFRM = Indicators related to official indicators of other EnRD components (note that intervention municipalities usually did not receive all EnRD components).

Considering the intervention's effect on the availability of planning documents, we find no positive effects on the availability of zoning ordinance in municipalities. Hence, we conclude that the intervention did improve quality of planning documents but was not able to reach highly politicized documents such as the zoning ordinance. CLUPs developed in the course of the intervention are generally of "higher quality", but the intervention was not necessarily able to improve the process of their development in all intervention municipalities. Interviews with planning staff revealed that the development of a CLUP poses a significant burden on municipal planning staff in terms of time and resources (PP-05, PP-06, MP-03C, MP-05I, MP-15C, MP-16I). While in general terms the necessity for, and utility of, comprehensive CLUPs is acknowledged (RS-02, RS-03, GA-04, MP-10I), the development and updating process, as well as the approval process, is described as lengthy and as an additional burden for municipal planning staff (MP-09I, MP-12C, MP-19I, MP-20I, BC-04C).

With regard to the intervention's effect on the personnel situation in planning administrations, we find mixed results. When we consider the effect on availability of qualified planning staff in municipal planning administration, we find no effect of the treatment variables on the availability of zoning officers. However, the effect of the intervention on the availability of GIS experts is positive and significant for both the enhanced land-use planning intervention alone, and marginally stronger for enhanced land-use planning in combination with other EnRD programme components. Municipalities that received more trainings also show positive and significant treatment effects for both treatment variables with regard to the availability of GIS personnel.

In sum, regarding the availability of qualified planning staff, the intervention was able to contribute to improvements in the individual (technical) field of personnel but was not able to ease existing and structural personnel constraints in municipal planning offices. Interviews with municipal planning staff corroborate these findings. Municipal planning administrations tend to be operating under personnel constraints. Job-ordered staff (LGU clerks assigned to the Municipal Planning and Development Council (MPDC)) or personnel working in temporary positions within the planning administration are common (GA-02, PP-06, MP-10I, MP-16I), resulting in a loss of competencies and experiences when staff leave their assigned positions. Furthermore, qualified GIS staff are acknowledged to be crucial for the implementation of the requirements of enhanced land-use planning (MP-09I, MP-14I, MP-16I); however, several planners reported either missing GIS staff or the necessity for further trainings in the field (MP-01C, MP-03C, MP-10I, GA-01). The tight

personnel situation is further aggravated by a brain drain of trained GIS experts into better paying jobs outside the municipal administration (PP-06, CS-07). While the intervention's goals seem to be in line with personnel demands, it seems unable to address structural problems in the personnel situation of administrations.

Lastly, the intervention aimed at enhancing the modes and process of developing CLUPs by means of a systematic integration of barangay-level information and planning goals such as public participation. In contrast to our expectation, we find only limited positive effect of the intervention on the degree of integrating barangay information (only among municipalities receiving the intervention already before 2012) and no effect on the degree of public participation. Negative effects on barangay integration and public participation are most pronounced, with municipalities receiving the intervention after 2012.

Table 6: Municipal-level models: treatment effects for land-use planning indicators

Outcome Variables	Intervention	Total sample	High training intensity	Intervention after 2012	Intervention before 2012
Zoning officer	enh. LUP	-0.085	0.010		-0.009
	enh. LUP + EnRD	0.120	0.185		0.199
Zoning Ordinance	enh. LUP	-0.114	-0.078		-0.089
	enh. LUP + EnRD	0.031	0.095		0.125
GIS expert +	enh. LUP	0.274**	0.337**	-0.020	0.221
	enh. LUP + EnRD	0.283**	0.331**	-0.015	0.318**
CLUP - approval+	enh. LUP	-0.198	-0.117		-0.157
	enh. LUP + EnRD	0.238**	0.251**		0.253**
CLUP – usability+	enh. LUP	0.802	1.216	0.348	0.943
	enh. LUP + EnRD	2.244**	2.605***	1.219	2.508***
CLUP – Vol.1 comprehensiveness+	enh. LUP	0.080	0.185	0.046	0.148
	enh. LUP + EnRD	0.308**	0.351**	0.221	0.324**
CLUP – Vol.2 comprehensiveness+	enh. LUP	0.055	0.179	-0.115	0.218
	enh. LUP + EnRD	0.362**	0.377**	0.017	0.421***
CLUP – Vol.3 comprehensiveness +	enh. LUP	-0.106	0.003	-0.224	-0.127
	enh. LUP + EnRD	0.245	0.360**	-0.172	0.320**
CLUP – participatory development+	enh. LUP	-0.066	0.005	-0.443**	-0.044
	enh. LUP + EnRD	0.064	0.110	-0.494**	0.170
CLUP – barangay integration+	enh. LUP	0.052	0.172	-0.468**	0.174
	enh. LUP + EnRD	0.183	0.182	-0.495**	0.311**
CLUP – natural hazards+	enh. LUP	0.064	0.111	-0.279	0.150
	enh. LUP + EnRD	0.381***	0.434***	-0.204	0.455***

Outcome Variables	Intervention	Total sample	High training intensity	Intervention after 2012	Intervention before 2012
CLUP – climate change+	enh. LUP	0.160	0.236	-0.279	-0.157
	enh. LUP + EnRD	0.404***	0.454***	-0.204	0.253**

Note: Reported are average treatment effects on the treated (ATTs). Significance levels: * p<0.10, ** p<0.05, *** p<0.01. ATTs in parentheses mark weak matching models. Models include 2012 and 2016 data. Models marked with + do only have endline information for the outcome variable. Treatment variables: enh. LUP: enhanced land-use planning. Enh. LUP + EnRD: municipalities which received other EnRD measures are excluded from control group (but not from intervention), ATT measures common effect of enhanced LUP and EnRD. Models 2–4 use subsamples. Models with missing ATT were not calculated due to restricted sample size. Region 6 and region 8 not calculated due to reduced sample size.

Qualitative evidence suggests that the systematic integration of barangay information and extensive participation is, by tendency, considered a burden to municipal planners. Participation is a time-intensive process, and the often large number of barangays in municipalities render a comprehensive participation process very difficult (GA-01, BC-04C, RS-02, MP-12C, MP-20I) which is only achieved in very exemplary cases (MP-06I). Negative treatment effects in municipalities receiving the intervention since 2012 can be explained by a significantly reduced intervention intensity, which did not incorporate a systematic barangay-level participation and plan integration.

Regarding the surrounding conditions that are responsible for positive effects of the intervention, we can conclude that these are associated with municipalities receiving a high number of trainings, making this an important determinant for successful implementation; a factor, which can be influenced by the implementing agencies. The interviews further show that the successful development of enhanced land-use planning is crucially dependent on supporting framework conditions in municipalities. Besides a sufficient number of qualified planning staff, interviewees mention a supporting political and administrative environment to be a crucial determining factor for successful land-use planning (GA-02, GA-01, MP-05I, MP-07I, MP-08I, MP-09I, DA-04, DA-05). In individual cases, interviewees mention political pressure from executive staff or the political bodies in the municipality to be harmful to planning and plan implementation (GA-01, GA-02, MP-05I, MP-07I). However, a well-developed and established CLUP can also serve as a supporting argument to deny politicized influence on planning and development goals (MP-07I).

Due to the increased capacity of municipal planners to engage in comprehensive land-use planning, we expect the intervention to influence public perception of municipal planning and enforcement of land use. Results on the perception of the municipal population (subsample of municipalities that have a zoning ordinance) of planning-related topics is presented in Table 7.

In contrast to the expected results, we find no relation between the intervention and public awareness and perception of the zoning ordinance, nor of its enforcement in municipalities.[19] This is surprising, as the zoning ordinance is the planning instrument that is most closely associated with people's lives, as it forms the basis for individual building- and location-permits.

However, due to the missing observable effects at the municipal level regarding the personnel situation of zoning officers, the limited effects on the household level become plausible. These observations are in line with findings by Santos et al. (2016), who find plan implementation and enforcement lacking among LGUs in Leyte. The analysis of sub-groups, such as households that are actively involved in barangay politics or are located in municipalities that received a high number of trainings, does not show different results. We can conclude that the intervention's missing effect on the presence of zoning officers and zoning ordinances in LGUs, is reflected in the missing effects on public awareness of the administrative documents and practices.

[19] *The only observable effects can be found in models depicting awareness of households in region 8. However, model diagnostics suggest a low PSM matching quality and thus unreliable treatment effect estimation. Hence, we refrain from interpreting these results.*

Table 7: Household-level models: treatment effects for land-use planning indicators

Outcome Variables	Intervention	Total sample	Active HHs	High training intensity	Region 8	Intervention before 2012
Have your heard of a zoning ordinance?	enh. LUP	0.043	0.071	0.005	0.183	0.048
	enh. LUP + EnRD	-0.065	-0.05	-0.071	-0.01	-0.08
Is there a zoning ordinance in your municipality?	enh. LUP	0.04	0.061	-0.004	(0.194*)	0.058
	enh. LUP + EnRD	-0.064	-0.05	-0.07	-0.015	-0.082
Does the local government enforce zoning ordinance?	enh. LUP	0.047	0.068	-0.004	(0.196*)	0.043
	enh. LUP + EnRD	-0.084	-0.06	-0.088	-0.022	-0.104

Note: Reported are average treatment effects on the treated (ATTs). Significance levels: * p<0.1, ** p<0.05, *** p<0.01. ATTs in parentheses mark weak matching models. Models include 2012 and 2016 data. Models marked with + only have endline information for the outcome variable. Treatment variables: enh. LUP: enhanced land-use planning. Enh. LUP + EnRD (municipalities that received other EnRD measures) are excluded from the control group (but not from intervention), ATT measures the common effect of enhanced LUP and EnRD. Models 2–5 use subsamples. Region 6 and Intervention after 2012 are not calculated due to reduced sample size. Region 8: cities (1 case) is excluded from the sample.

FGDs with households and barangay captains show mixed results in terms of the intervention's effect on the building of public awareness. While in some interviews with barangay captains, the village heads doubt their households' knowledge and awareness of planning-related information (BC-01C, BC-03I, BC-04C, CS-06), others claim that people in their barangays are informed and knowledgeable (BC-36, BC-38). Upon asking households about their knowledge on planning topics, answers remain vague and of little detail. Individual respondents claim the information distribution through the barangay captains to be one bottleneck to distributing information to individual households (MP-03C, CS-02). Others report that public hearings at the municipal level are the common mode of informing the public, which might in turn not reach the individual households (MP-03C), who are more concerned with topics directly affecting their lives, such as sustaining their livelihoods (CS-01, HH-05I). Generally, the interviews show that the mode and intensity of informing the public seem to vary between individual municipalities and barangays. It also seems that not all households are equally receptive and interested in land-use planning topics (HH-01C, HH-03I, HH-04I, HH-05I, HH-06C).

Returning to the evaluation question and summing up the main findings of this impact field, we can state that concerning *questions IF1a* the intervention was able to contribute to improvements in land-use planning. Improvements such as higher (perceived) plan quality, comprehensiveness and larger share of approved plans are associated with joint effort by SIMPLE and the EnRD programme components as well as in those municipalities where the intervention started before 2012. However, there is little evidence for subsequent plan implementation and enforcement. This finding is also supported in literature, for instance by Santos et al. (2016), who find the lack of the implementation and enforcement of zoning principles and building codes to be a substantial problem among municipalities in Leyte.

Regarding *question IF1b* we can state that the intervention contributed to improvements in the situation regarding technical personnel, such as GIS staff, but was not able to ease structural bottlenecks in the personnel situation of municipal planning administrations, especially with regard to key planning personnel such as zoning officers.

Concerning the goal of the intervention to improve the integration of CLUPs from provincial and village level (*question IF1c*) we can state that this goal was only achieved in intervention municipalities that had already received the intervention by 2012. Municipalities that started receiving the intervention after 2012 only received the intervention with a limited scope that, in turn, led to a significant reduction of effects, as the integration of barangay information was not systematically pursued in late-intervention municipalities.

A systematic participatory development of the CLUP (beyond standardized procedures such as public hearings) was not achieved.

Lastly, looking at the determinants for successful implementation of the intervention (*question IF1d*), we can state that, generally, higher intensity of trainings is associated with better performance of the intervention, as well as when the municipalities received the intervention with the full set of processes (such as the integration of barangay information and plans). Qualitative evidence stresses the importance of political support from local executives and from political bodies in the municipality, and sufficient personnel and technical resources in the planning administration. Absent staff, missing technical personnel, or temporary job assignments can undermine the potential for improvements by the intervention. In contrast to rather positive findings at the administrative level, the analysis shows that in the broad perspective the intervention seemed generally not to be able to improve the dissemination of information to the wider public. Hence, it was not able to improve public awareness and information about planning-related topics among affected households.

4.3 Impact field 2: "(Sustainable) Natural Resource Management"

4.3.1 Description of impact field

Following the ToC, the impact field "(Sustainable) Natural Resource Management" looks at the effect of the intervention following a successful implementation of enhanced land-use planning, the enforcement of its formulated planning goals, and the implementation of priority projects. Due to the high importance of topics related to the conservation of natural resources, which is also reflected in the name of the "Natural Resources Governance" component of EnRD, we expect effects that contribute to improvements in the environmental quality and increasing awareness of environmental topics among the population.

At municipal and barangay level, we expect a positive influence on the presence of conservation and livelihood projects, namely tree nurseries and planting, and in coastal municipalities and barangays to find mangrove nurseries and mangrove plantings. Livelihood initiatives involving the provision of seedlings are also expected to have a stronger presence in intervention areas. The projects and initiatives are supposed to be developed and formulated in the CDPs, which is supposed to follow the CLUP on the implementation side. Furthermore, intervention municipalities and barangays are expected to possess more and larger protected areas, including marine sanctuaries and coastal protected areas, to contribute to the preservation of these vital and sensitive ecosystems. On a larger scale and in a more long-term perspective, we expect changes to the total tree cover in intervention municipalities (reduced deforestation), caused by a stronger observation of zoning principles and reduced encroachment of municipal development on forest fringes.

At the household level, the enforcement of zoning principles is expected to reduce the conversion of forest land to agricultural and settlement use. It is also expected to contribute to an increased awareness and stronger perception of the presence of above-mentioned conservation and livelihood projects in their respective barangays and municipalities.

4.3.2 Evaluation questions and operationalization

To examine the effects of enhanced land-use planning on (Sustainable) Natural Resource Management we address the following evaluation questions:

To what extent and in what ways did enhanced land-use planning lead to an actual change of land use and (sustainable) natural resource management?

- **IF2a:** To what extent did enhanced land-use planning lead to actual change in land use and sustainable use of natural resources?
- **IF2b:** To what extent did enhanced land-use planning lead to an increase in the definition of protected areas and to an increase in the availability of livelihood programmes?

- **IF2c:** To what extent did enhanced land-use planning lead to higher awareness of protected areas and better enforcement of protected areas?

We use the following empirical indicators to answer the evaluation questions (Table 8). The data are derived from all quantitative surveys (municipality-, barangay- and household-survey), as well as through the integration of external remote sensing data to assess changes in tree cover.

Table 8: Outcome variables for Impact field 2

Eval. questions	Level	Indicator	Description	Relation to EnRD indicators	Unit	Mean 2012	Mean 2016
IF2a	Household	Conversion m2+	Size of land that was reported to be converted from forest or vacant land to agriculture or residential land between 2012 and 2016	NRG_{Impl}	Square meter	-	H: 89.315 (1180.29)
IF2a	Household	Conversion+	HH reported to have converted land from forest or vacant land to agriculture or residential land between 2012 and 2016	NRG_{Impl}	1 – yes, 0 – no.	-	H: 0.054
IF2a	Municipality, Barangay	Tree cover change	Percentage of tree cover in municipality / barangay (corrected for typhoon Yolanda effect)	CBFM indicators 2 and 3	0 – 100 %	M: 58.99 (28.28) B: 55.02 (29.81)	M: 57.19 (27.60) B: 53.15 (28.96)
IF2a	Municipality, Barangay, Household	Tree nurseries	Tree nursery projects reported by MPDO (barangay captain, household) to exist in the municipality (barangay).	CBFM indicators 2 and 3	1 – yes, 0 – no.	M: 0.760 B: 0.377 H: 0.458	M: 0.697 B: 0.317 H: 0.299
IF2a	Municipality, Barangay, Household	Tree planting	Tree planting projects reported by MPDO (barangay captain, household) to exist in the municipality (barangay).	CBFM indicators 2 and 3	1 – yes, 0 – no.	M: 0.910 B: 0.846 H: 0.699	M: 0.950 B: 0.743 H: 0.668
IF2a	Municipality, Barangay, Household	Mangrove nurseries	Mangrove nurseries projects reported by MPDO (barangay captain, household) to exist in the municipality (barangay).	CBFM indicators 2 and 3; CFRM indicator 2	1 – yes, 0 – no.	M: 0.434 B: 0.236 H: 0.196	M: 0.500 B: 0.190 H:0.195
IF2a	Municipality, Barangay, Household	Mangrove planting	Mangrove planting projects reported by MPDO (barangay captain, household) to exist in the municipality (barangay).	CBFM indicators 2 and 3; CFRM indicator 2	1 – yes, 0 – no.	M: 0.660 B: 0.323 H: 0.238	M: 0.770 B: 0.290 H: 0.281
IF2b	Municipality, Barangay, Household	Seedling provision	Seedling provision projects reported by MPDO (barangay captain, household) to exist in the municipality (barangay).	CBFM indicators 2 and 3; CFRM indicator 2	1 – yes, 0 – no.	M: 0.860 B: 0.751 H: 0.609	M: 0.880 B: 0.577 H: 0.469

Eval. questions	Level	Indicator	Description	Relation to EnRD indicators	Unit	Mean 2012	Mean 2016
IF2c	Household	Protected area	Household reported at least one protected area to exist in the municipality.	CFRM indicator 2; NRG_{Impl}	1 – yes, 0 – no.	H: 0.397	H: 0.392
IF2b	Municipality, Barangay	Number of protected areas (log)*	Number of protected areas reported by MPDO (barangay captain) in municipality / barangay (log. scale)	CFRM indicator 2; NRG_{Impl}	0 - 8.522	M: 0.575 (0.594)	M: 1.167 (0.840) B: 0.897 (1.320)
IF2b	Municipality, Barangay	Estimated size of protected area (log)*	Total estimated size of protected areas reported by MPDO (barangay captain) in municipality / barangay (log. scale)	CFRM indicator 2; NRG_{Impl}	0 – 6.090	M: 4.465 (2.907)	M: 5.828 (2.491) B: 2.401 (2.185)
IF2b	Municipality	Protected coastal area⁺	Protected coastal area reported by MPDO to exist in the municipality.	CFRM indicator 2	1 – yes, 0 – no.	-	M: 0.604
IF2b	Municipality	Marine sanctuary	Protected marine sanctuary reported by MPDO to exist in the municipality.	CFRM indicator 2	1 – yes, 0 – no.	-	M: 0.747

Note: * Due to substantial differences in number and sizes between protected areas in municipalities, we used a natural logarithmic dependent variable to reduce distortion. Models marked with ⁺ only have endline information for the outcome variable. ° The relationship of empirical indicators with EnRD programme indicators as agreed with the BMZ: NRG = Indicator related to official NRG / SIMPLE component indicators; NRG_{Impl} = Indicator directly related to implementation logic of NRG; DRM/CBFM/CFRM = Indicators related to official indicators of other EnRD components (note that intervention municipalities usually did not receive all EnRD components).

4.3.3 Results and discussion

We present the results of the econometric analysis at municipal and barangay levels in Table 9. The analysis shows only limited evidence for positive effects of the intervention on topics associated with the protection of natural resources and a more sustainable land use.

Analysis at the municipal and barangay level reveals that municipalities receiving enhanced land-use planning in combination with other EnRD interventions demonstrate a stronger presence of tree nursery projects compared to control municipalities. Furthermore, the intervention exerts a positive effect on the number of protected areas established in municipalities. In line with findings from Impact field 1 (section 4.2), the analysis shows that the intensity of the intervention, approximated by the number of trainings received, has a positive influence on the existing outcomes and impacts. We observe similar positive effects for municipalities that had already received the intervention by 2012, and had received the full intervention scheme. In contrast, municipalities receiving a late intervention show an, on average, negative effect on the size of protected areas, compared with their matched counterparts. Beyond these findings, all other indicators do not demonstrate significant effects that can be attributed to the intervention at the municipal level.

At barangay level, the evidence for outcomes and impacts attributed to the intervention is scarcer. Surprisingly, we find no positive evidence for an increased awareness of protected areas, in contrast to the municipal level. One potential explanation for this missing effect might be the limited efforts in implementation beyond mere delineation in municipal planning documents. Only barangays receiving the intervention in combination with other EnRD programme components, and barangays located in municipalities receiving a late intervention demonstrate a higher presence of livelihood initiatives. Barangays located in municipalities receiving the intervention before 2012 show negative effects in terms of tree-planting activities but positive effects related to the number of protected areas.

In general terms, the effects of the intervention in Impact field 2 are limited. A first explanation for this observation might be related to limitations in enforcement and monitoring of CLUP implementation. Qualitative interviews reveal a rather consistent assessment of shortcomings in plan implementation and enforcement due to resource constraints in municipal planning administrations. While the importance of enforcement is considered crucial, interviewees at different administrative levels share the common assessment that limited personnel and financial resources is undermining plan implementation and enforcement, especially at municipal level (PP-04, PP-05, PP-06, MP-03C, MP-05I, MP-07I, MP-15C, MP-16I). While this assessment generally relates to the CLUP itself, it is also related to project implementation, including environmental conservation projects such as tree-planting activities (PP-05).

Table 9: Municipal and barangay-level models: treatment effects for natural resource management indicators

Outcome Variables	Intervention	Total sample	High training intensity	Intervention after 2012	Intervention before 2012
Municipal level models					
Tree cover	enh. LUP	-0.008	-0.023	0.034	0.071
	enh. LUP + EnRD	0.020	-0.008	0.003	-0.018
Tree nurseries	enh. LUP	0.195	0.152	0.258	0.212
	enh. LUP + EnRD	0.354***	0.324 **	0.187	0.313 ***
Tree planting	enh. LUP	-0.035	0.017	0.048	0.003
	enh. LUP + EnRD	0.022	-0.015	0.121	0.002
Mangrove nurseries	enh. LUP	-0.013	-0.026	0.128	-0.046
	enh. LUP + EnRD	-0.143	-0.150	-0.019	-0.187
Mangrove planting	enh. LUP	0.121	0.151	-0.020	0.128
	enh. LUP + EnRD	0.032	0.063	-0.135	0.089
Seedling provision	enh. LUP	-0.043	-0.029	-0.008	-0.001
	enh. LUP + EnRD	0.025	0.025	-0.048	0.019
Total estimated size of protected areas (log)	enh. LUP	-0.256	0.227	-2.728*	4.540 ***
	enh. LUP + EnRD	-0.194	0.306	(-2.362 *)	2.298
Number of protected areas (log)	enh. LUP	0.479***	0.345 *	-0.458	0.713 ***
	enh. LUP + EnRD	0.486**	0.477***	-0.451	0.695 ***
Protected coastal area +	enh. LUP	0.167	0.170	-	-
	enh. LUP + EnRD	0.127	0.122	-	-
Marine sanctuary +	enh. LUP	0.068	-0.008	-	-
	enh. LUP + EnRD	0.084	0.097	-	-

Outcome Variables	Intervention	Total sample	High training intensity	Intervention after 2012	Intervention before 2012
Barangay level models					
Tree cover	enh. LUP	0.001	0.007	0.005	0.002
	enh. LUP + EnRD	0.004	0.006	-0.001	0.005
Tree nurseries	enh. LUP	-0.077	-0.106	-0.105	-0.094
	enh. LUP + EnRD	-0.140	-0.128	-0.238	-0.140
Tree planting	enh. LUP	-0.062	-0.144	0.021	-0.194 ***
	enh. LUP + EnRD	0.055	0.026	-0.015	0.059
Mangrove nurseries	enh. LUP	0.033	-0.004	-0.070	-0.045
	enh. LUP + EnRD	-0.032	-0.056	0.204	-0.045
Mangrove planting	enh. LUP	0.051	0.085	0.024	-0.037
	enh. LUP + EnRD	0.020	-0.032	0.088	0.011
Seedling provision	enh. LUP	0.028	0.010	0.333	-0.152
	enh. LUP + EnRD	0.011	0.006	0.367 **	-0.011
Total estimated size of protected areas (log)	enh. LUP	-0.990	-1.324	-0.807	-1.893
	enh. LUP + EnRD	0.226	0.225	1.047	0.068
Number of protected areas (log)	enh. LUP	-0.174	-0.017	0.065	-0.050
	enh. LUP + EnRD	0.354	0.610	0.964	0.625 **

Note: Reported are average treatment effects on the treated (ATTs). Significance levels: * p<0.10, ** p<0.05, *** p<0.01. ATTs in parentheses mark weak matching models. Models include 2012 and 2016 data. Models marked with + only have endline information for the outcome variable. Treatment variables: enh. LUP: enhanced land-use planning. Enh. LUP + EnRD: municipalities which received other EnRD measures are excluded from control group (but not from intervention), ATT measures common effect of enhanced LUP and EnRD. Models 2 –4 use subsamples. Models with missing ATT were not calculated due to restricted sample size. Region 6 and region 8 not calculated due to reduced sample size. Region 8: cities (1 case) excluded from the sample.

Similar observations of limited effects can be made when considering the results at household level (Table 10). Only limited evidence for positive outcomes and impacts of the intervention exists. The intervention was neither capable of systematically reducing the amount of actual land conversion from forest to agricultural land (limited positive evidence exists for region 6; most likely related to structural effects), nor did it have a substantial awareness-building function for the population in terms of projects and initiatives related to environmental conservation. Surprisingly, we can see a negative effect on the awareness of the presence of tree nurseries in their respective municipality at household level. In municipalities receiving the late intervention, households-level results even indicate an effect of increased land conversion.

FGDs with barangay captains and households reveal relatively little detailed information about environmental topics in their barangays (HH-03I), except for the existence of protected areas among barangay captains (BC-03I, BC-04C). In line with previous results, this might be attributed to shortcomings in information distribution or unsuitable modes of public information. The modes of informing the population vary among different barangays, from personal information during meetings to distributing leaflets (BC-03I, MP-04C). The chain of information from the planning administration to households is long – information might therefore not always reach the recipient at the lowest level. In line with the situation of limited information, the

discussions show a mixed picture of households' individual perception of and compliance with environmental conservation. There seems to be no individual consensus on the priority and role of environmental conservation in the households' living environment, neither between intervention nor control municipalities (HH-01C, HH-02I, HH-03I, HH-04I). Again, awareness seems to be linked with relatively little specific knowledge or personal interest in the topic (BC-03I, BC-04C).

A possible explanation can be found in the perception of participation processes. According to the respondents, information is often distributed in a top-down manner, rather than households actually being consulted. Households therefore do not see benefits in attending public hearings or other meetings related to information about land-use planning (BC-02I, BC-03I, CS-06).

Table 10: Household-level models: treatment effects for natural resource management indicators

Outcome Variables	Intervention	Total sample	Active HHs	High training intensity	Region 8	Region 6	Intervention after 2012	Intervention before 2012
Land conversion (dummy)	enh. LUP	-0.018	-0.017	0.005	-0.022	(0.008)	0.011	0.007
	enh. LUP + EnRD	0.016	0.000	0.016	0.005	(-0.034**)	0.036*	0.011
Land conversion m^2	enh. LUP	57.35	36.596	91.496	-21.284	(28.755)	120.158*	91.406
	enh. LUP + EnRD	23.535	-105.264	56.924	-61.573	(-4.572)	97.748	14.216
Protected area	enh. LUP	-0.02	-0.034	-0.094	(-0.147)	-0.002	-0.122	-0.096
	enh. LUP + EnRD	0.089	0.088	0.086	(0.194)	0.091	(-0.11)	0.115
Tree nurseries	enh. LUP	0.043	0.062	0.009	(0.011)	0.052	0.042	0.025
	enh. LUP + EnRD	-0.167***	-0.176***	-0.211***	(-0.268**)	-0.064	(0.036)	-0.162
Tree planting	enh. LUP	0.063	0.096	-0.008	(0.1)	0.071	0.072	-0.018
	enh. LUP + EnRD	-0.015	-0.002	-0.035	(0.056)	-0.013	0.101	-0.002
Mangrove nurseries	enh. LUP	0.011	0.03	0.019	0.035	(0.009)	-0.034	-0.012
	enh. LUP + EnRD	-0.054	-0.036	-0.042	-0.021	(0.007)	(0.068)	-0.047
Mangrove planting	enh. LUP	0.018	0.039	0.064	0.06	(0.1)	0.063	-0.015
	enh. LUP + EnRD	0.001	0.019	0.005	0.027	(0.104)	(0.118)	-0.001
Seedling provision	enh. LUP	0.005	0.008	0.023	0.027	(0.228)	-0.066	0.004
	enh. LUP + EnRD	0.083	0.167***	0.130*	0.062	(0.211*)	(-0.068)	0.14

Note: Reported are average treatment effects on the treated (ATTs). Significance levels: * $p<0.1$, ** $p<0.05$, *** $p<0.01$. ATTs in parentheses mark weak matching models. Models include 2012 and 2016 data. Models marked with $^+$ only have endline information for the outcome variable. Treatment variables: enh. LUP: enhanced land-use planning. Enh. LUP + EnRD: municipalities which received other EnRD measures are excluded from control group (but not from intervention), ATT measures common effect of enhanced LUP and EnRD. Models 2–7 use subsamples. Region 8: cities (1 case) excluded from the sample.

With regard to the limited effects on actual land-use change, qualitative evidence indicates that actual change of land use or deforestation is commonly taking place unnoticed by the municipal planning administrations (CS-06, BC-01C, BC-04C, MP-04C). The incentive to report land-use change is furthermore limited, as the official reclassification of land is associated with changes in taxation. Reported land-use change can thus lead to higher taxation for individual dwellers or owners (BC-04C, MP-01C). Due to limitations in the enforcement and monitoring of planned land use, there is little deterrence to engaging in land-use change.

Returning to the evaluation questions, we can state regarding evaluation *question IF2a* that the intervention did not exert substantial influence on actual change in land use. Positive effects are mostly concentrated at the municipal level and materialize in the definition of more protected areas. In contrast, no systematic positive influence on actual change of land use at the household level can be observed. Due to the decreasing visibility of effects cascading from municipal, through barangay, to the household level, we conclude that the transmission mechanism and transfer of information related to planning was not successfully established.

Regarding evaluation *question IF2b*, the results show that the intervention was able to increase the definition of protected areas in municipalities receiving the intervention. However, municipalities receiving the intervention after 2012 are an exception to this trend. This can be attributed to the limited scope of the intervention after 2012, especially when other EnRD programme components were not supplied.

Lastly, evaluation *question IF2c* raises the issue of public awareness of protected areas and their administrative enforcement. Regarding public awareness, we find no significant effect of the intervention on perceived knowledge or on raised awareness of protected areas. Qualitative evidence renders a mixed picture of public awareness. Regarding the enforcement of protected areas, we rely on qualitative evidence. However, in line with previous findings, the analysis of interviews suggests that the enforcement of protected areas might be limited due to described bottlenecks in personnel and resources among municipal administration (PP-05, PP-06, MP-03C, MP-05I, MP-15C, MP-16I).

Another explanation for the limited visibility of outcomes and impacts could be attributed to a lack of communication between environmental and agricultural offices of the municipalities. Project implementation in environmental conservation is often not carried out in the planning office, but rather the municipal agricultural or environmental office, or it is handed out to third-party administrations such as the local DENR office (MP-19I). Municipal planners, responsible for answering the survey, might thus not be aware of the full extent of measures taking place in the municipality. However, the consistencies in limited evidence throughout municipal- and barangay-level surveys also underline the possibility of a limited degree of outcomes and impacts in general. Despite limited scientific evidence available, experiences from developed countries corroborate our general findings. For instance, and despite explicit and restrictive land-use planning policy, Robinson et al. (2005) find no positive effect of land-use planning policy on reducing land conversion towards residential land in Seattle's urban fringe.

Generally, positive effects are mostly visible when enhanced land-use planning is applied in combination with other EnRD programme components. The interviews underline the importance of these components (MP-11I, MP-19I) (such as the community-based forest management component or the integrated coastal resource management) for the achievement of environmental goals, which cannot be met by relying on comprehensive land-use planning alone.

4.4 Impact field 3: "Disaster Risk Management"

4.4.1 Description of impact field

Disaster Risk Management (DRM) plays an important role in the Philippines. Its geographic location makes it highly vulnerable to natural hazards such as tropical cyclones or other events that harm a significant number of its population. Additionally, the effects of global climate change are likely to magnify the burden of

natural disasters by increasing both the frequency and the intensity of disastrous events. To strengthen the resilience of the population, DRM measures need to be implemented at all levels, from household to municipal level.

In order to assess DRM, we follow the extended Social Risk Management framework, originally developed by the World Bank (Holzmann and Jørgensen, 2001; Leppert, 2015). We concentrate on proactive risk-management approaches that either reduce or eliminate the risk, limit the extent of the shock, or mitigate the impacts of the shock. All these proactive strategies have in common that they are being preventively developed in anticipation of a shock, before it occurs. Reactive strategies, which are implemented ad hoc after the shock hits, are not evaluated in this impact assessment. We distinguish DRM strategies by the level at which they are implemented: the individual or household level, the community level, and the public level (i.e. municipal and barangay governments).

Enhanced land-use planning applies several measures to strengthen DRM capacities at the municipal and barangay level, but should also support household measures. A specific DRM instrument of land-use plans is hazard zones. Identification, documentation, communication, and enforcement of hazard zones is an essential requirement of land-use plans, and is supported by GIS-trainings and risk mapping. Municipalities are advised to improve and document their procedures for emergencies and are supported to improve their emergency facilities.

In Impact field 3 (DRM) we therefore expect intervention municipalities and barangays to engage in planning related to infrastructural DRM measures, as well as in measures to improve immediate shock response. Planning and infrastructural measures include, on the one hand, proactive measures such as the improvement of municipal infrastructure and the creation of floodplains and, on the other hand, proactive establishment of disaster-management practices, such as the development of disaster-management plans. In addition, households and communities need to proactively implement immediate shock response measures, such as early warning systems and evacuation centres to ensure that they are able to react quickly once a disaster strikes. Furthermore, community-based DRM measures such as disaster drills or the establishment of relief funds need to be strengthened. This includes all measures of self-reliant disaster preparation and coping measures taking place at the barangay level. At the same time, we expect the thematic linkage between growing disaster risks and the potential negative effects of global climate change to be better understood and acknowledged.

Increasing disaster preparedness at the municipal and barangay levels is supposed to trickle down to local households, leading to increased awareness about the occurrence of natural hazards. Furthermore, due to the direct impact on people's lives, we also expect this increased information to materialize in the pursuit of individual and household DRM strategies to reduce risks (such as improving the house), diversify risks (such as the diversification of income), participation in community DRM strategies (such as improving community infrastructure), and an increase in individual spending on these actions for disaster preparedness.

4.4.2 Evaluation questions and operationalization

To examine the effects of enhanced land-use planning we use the following evaluation questions:

To what extent and in what ways did enhanced land-use planning improve DRM?

- **IF3a:** To what extent did enhanced land-use planning lead to implemented and functioning disaster risk reduction and management strategies of municipalities, barangays and households?
- **IF3b:** To what extent did enhanced land-use planning increase awareness of hazard zones and reduce settling in hazard zones?
- **IF3c:** To what extent did enhanced land-use planning increase adaptation capacities to climate change?

Table 11 describes the indicators used for this impact field. All indicators are based on survey data or geographic data. For municipality and barangay indicators, only 2016 data are available, for some household

indicators 2012 and 2016 data are available. For the household variable "Correct knowledge of risk exposure" external geographical data on risks are also used. The indicator equals one if the household correctly indicated that it lives in a hazard zone in comparison to hazard zones identified by the risk data (see also annex 7.1.3). DRM measures at municipal, barangay, and household levels are constructed as composite indicators using factor analysis. Further details on index construction can be found in Annex 7.2.

Table 11: Outcome variables for Impact field 3

Eval. questions	Level	Indicator	Description	Relation to EnRD indicators	Unit	Mean 2012	Mean 2016
IF 3a	Municipality, Barangay	Planning and infrastructural DRM+	DRM index: Planning and Infrastructural DRM (index of applied measures)	DRM indicator 2	0 - 1	-	M: 0.731 (0.283) B: 0.552 (0.330)
IF 3a	Municipality, Barangay	Immediate shock response+	DRM index: Measures of immediate response to natural disasters	DRM indicator 2; related to EnRD indicator 1	0 - 1	-	M: 0944 (0.182) B: 0.852 (0.278)
IF 3a	Municipality, Barangay	HH / community shock reduction / mitigation+	DRM index: Institutional: HH / community shock reduction / mitigation	DRM indicator 2; related to EnRD indicator 1	0 - 1	-	M: 0.309 (0.370) B: 0614 (0.278)
IF 3a	Household	HH DRM strategies: Reduction+	HH DRM Index: Social Risk management strategies directed at reduction of risks.	DRM indicator 2; related to EnRD indicator 1	0 - 1	-	H: 0.453 (0.251)
IF 3a	Household	HH DRM strategies: Diversification+	HH DRM Index: Social Risk management strategies directed at diversification of risks.	DRM indicator 2; related to EnRD indicator 1	0 - 1	-	H: 0.523 (0.247)
IF 3a	Household	Community DRM strategies +	Community DRM Index: Household supporting community measures.	DRM indicator 2; related to EnRD indicator 1	0 - 1	-	H: 0.393 (0.384)
IF 3a	Household	DRM expenditures +	HH expenditures on disaster risk measures.	DRM indicator 2; related to EnRD indicator 1	$ (PPP)	-	H: 639 (1316)
IF 3b	Household	Informed of hazards	HH reports to have been informed about hazard zones.	DRM indicator 1 and 2; related to EnRD indicator 1	1 – yes, 0 – no.	H: 0.412	H: 0.598
F 3b	Municipality, Barangay	Population information on hazards	Date of most recent information of the population about natural hazards in municipality / barangay	DRM indicator 1 and 2; related to EnRD indicator 1	metric	M: 2008 (4.15) B: 2007 (3.21)	M: 2014 (3.43) B: 2013 (3.21)

Eval. questions	Level	Indicator	Description	Relation to EnRD indicators	Unit	Mean 2012	Mean 2016
IF 3b	Household	Awareness of hazards	HH reported to have been aware of the risks of the environmental shocks it experienced.	DRM indicator 1 and 2; related to EnRD indicator 1	1 – yes, 0 – no.	H: 0.171	H: 0.469
IF 3b	Household	Correct knowledge of risk exposure	Household correctly specifies whether it lives in a hazard zone not. Comparison based on geographical data.	DRM indicator 1 and 2; related to EnRD indicator 1	1 – yes, 0 – no.	H: 0.694	H: 0.763
IF 3c	Municipality, Barangay	Awareness of climate change: severe weather events	MPDO's / Barangay captain's awareness of effects of climate change on municipality: increasing number of severe weather events	NRG_{Impl}; Related to EnRD indicator 1	1 – yes, 0 – no.	-	M: 0.759 B: 0.660
IF 3c	Municipality, Barangay	Awareness of climate change: rising sea level	MPDO's / Barangay captain's awareness of effects of climate change on municipality: rising sea level	NRG_{Impl}; Related to EnRD indicator 1	1 – yes, 0 – no.	-	M: 0.648 B: 0.388

Note: Models marked with ⁺ only have endline information for the outcome variable. ° The relationship of empirical indicators with EnRD programme indicators as agreed with the BMZ: NRG = Indicator related to official NRG / SIMPLE component indicators; NRG_{Impl} = Indicator directly related to implementation logic of NRG; EnRD = Indicator related to official indicators of entire programme; DRM/CBFM/CFRM = Indicators related to official indicators of other EnRD components (note that intervention municipalities usually did not receive all EnRD components).

4.4.3 Results and discussion

Table 12 presents the results of the econometric analysis at municipal and barangay level. The results show a robust and significant positive effect of the intervention in the field of planning and infrastructural DRM measures in intervention municipalities. Both enhanced land-use planning alone and in combination with other EnRD components were able to improve municipalities' disaster preparedness in planning and infrastructural DRM measures. On this indicator, enhanced land-use planning in combination with EnRD performs stronger than enhanced land-use planning alone. In line with previous results, high training intensity is associated with stronger effects. In contrast, municipalities where intervention started after 2012 do not show positive effects. For measures concerned with immediate shock response and mitigation, we do not find positive effects; we even find negative effects for municipalities receiving the intervention after 2012. Lastly, community-based shock-reduction measures show significant positive effects only in high-treatment municipalities.

Results at barangay level stand largely in contrast to municipal-level results. The analysis reveals that particular barangays that received the intervention after 2012 show significant stronger effects in all three fields of DRM compared to control barangays. Specifically, planning and infrastructural DRM and community-based measures show the strongest positive effect. The outstanding position of these barangays is also mirrored in results at the level of the household.

Surprisingly, neither MPDOs nor barangay captains in treatment municipalities report having *informed* the population about disaster risks and disaster response measures more often; this is a relevant finding on information transmission, as it might explain results at the barangay and household level.

Regarding *climate change awareness*, no treatment effects at the municipal level can be identified. At the barangay level, positive treatment effects for the two indicators are not robust, but can be found in differing subgroups and treatment variables.

Table 12: Municipal- and barangay-level models: treatment effects for DRM indicators

Outcome Variables	Intervention	Total sample	High training intensity	Intervention after 2012	Intervention before 2012
Municipal level models					
Planning and infrastructural DRM+	enh. LUP	0.108 **	0.179 **	0.078	0.172 **
	enh. LUP + EnRD	0.153 **	0.204 **	0.073	0.230 **
Immediate shock response+	enh. LUP	0.044	0.046	-0.219***	0.071
	enh. LUP + EnRD	-0.002	0.044	-0.024***	0.114
HH / community shock reduction / mitigation+	enh. LUP	0.110	0.076	0.029	-0.008
	enh. LUP + EnRD	0.139	0.136 **	0.047	0.058
Population information	enh. LUP	0.164	0.699	-	-
	enh. LUP + EnRD	0.040	-0.192	-	-
Awareness of climate change: severe weather events+	enh. LUP	0.075	-0.252	-	-
	enh. LUP + EnRD	-0.110	-0.193	-	-
Awareness of climate change: rising sea level+	enh. LUP	0.228	0.318	-	-
	enh. LUP + EnRD	-0.109	0.092	-	-
Barangay level models					
Planning and infrastructural DRM+	enh. LUP	0.025	0.032	0.185***	0.057
	enh. LUP + EnRD	0.062	0.035	0.172 **	0.057
Immediate shock response+	enh. LUP	-0.005	-0.010	0.076 *	-0.030
	enh. LUP + EnRD	0.020	0.011	0.098 ***	0.028
HH / community shock reduction / mitigation+	enh. LUP	0.047	0.036	0.162 ***	0.036
	enh. LUP + EnRD	0.020	-0.020	0.185 ***	0.003
Population information	enh. LUP	-2.320	-1.831	1.578	-2.549
	enh. LUP + EnRD	-1.455	-0.221	0.200	-1.728
Awareness of climate change: severe weather events+	enh. LUP	0.155*	0.184 **	0.165	0.186 *
	enh. LUP + EnRD	0.072	0.108	0.270 **	0.108
Awareness of climate change: rising sea level+	enh. LUP	0.078	0.050	0.212 **	0.058
	enh. LUP + EnRD	-0.026	-0.047	0.136	0.050

Note: Reported are average treatment effects on the treated (ATTs). Significance levels: * p<0.10, ** p<0.05, *** p<0.01. ATTs in parentheses mark weak matching models. Models include 2012 and 2016 data. Models marked with + only have endline information for the outcome variable. Treatment variables: enh. LUP: enhanced land-use planning. Enh. LUP + EnRD: municipalities which received other EnRD measures are excluded from control group (but not from intervention), ATT measures common effect of enhanced LUP and EnRD. Models 2 –4 use subsamples. Models with missing ATT were not calculated due to restricted sample size. Region 6 and region 8 not calculated due to reduced sample size. Region 8: cities (1 case) excluded from the sample.

At the household level (Table 13), we find no significant effects regarding *DRM strategies* (reduction, diversification, and community strategies) for the total sample, nor for active households, high training intensity and intervention before 2012. When splitting the sample in region 8 and 6, we do see a positive effect of enhanced land-use planning on risk-diversification measures and on DRM expenditures in region 8. Contextual factors and differences in the intervention in both regions therefore seem to play a large role for DRM. This effect seems to be mainly driven by those municipalities that joined the intervention only after 2012. As with the barangay level, households in municipalities with intervention after 2012 show strong positive effects on several DRM indicators; results are larger for the pure enhanced land-use planning intervention than for the combination of enhanced land-use planning and other EnRD components. Looking at DRM expenditures, we find positive effects in the group that received intervention after 2012. Here, effects are stronger when the intervention is combined with EnRD measures. In general, the weak results at household level are supported by the results of the qualitative interviews: households are aware of risks, but often lack the funds to invest (CS-01, HH-05I).

There are several possible explanations for the positive effects in municipalities with intervention after 2012. First, results have to be interpreted with care, as the PSM quality proves to be low due to a reduced sample size. However, results prove to be robust at household and barangay level. Second, stronger treatment effects might be partly explained by the geographic location of the municipalities that received a late treatment. These municipalities are located in region 8 and were more exposed to typhoon Yolanda than other municipalities. This might have increased their disaster risk awareness and led to increased DRM activities after 2012. This point was supported by qualitative interviews (DA-06) and has also been observed in other international examples, such as in a study on earthquakes in Japan (Onuma et al., 2017). Third, as suggested in the qualitative interviews (DA-06, DA-07), the intervention might be overlaid with effects of the implementation of Republic Act (R.A.) 10121 "Philippine Disaster Risk Reduction and Management Act" enacted in 2010 and R.A. 9729 "Climate Change Act" (Almarez et al., 2015). It seems plausible that the intervention was boosted by efforts resulting from national policy-making, and treatment municipalities that received the intervention after 2012 were more affected by this Act due to their geographical location, in comparison to control municipalities. If there are unobserved differences in this group (for example location effects) compared to its respective control group, which are correlated with the implementation of the Disaster Risk Management Act, the statistical matching might not be able to fully separate both effects. This is possible, as intervention municipalities in this group are located on Samar, while many controls are located on Leyte.

Effects on self-reported *informedness* and awareness of hazards regarding DRM are weak; only households in region 8 (in particular intervention after 2012) show positive treatment effects. This is in line with the findings at the municipal and barangay level. The transmission of information already seems to be interrupted at municipal level and is therefore not transmitted to households. Also, we do not find significant treatment effects regarding correct knowledge about whether households are in a hazard zone, which might be due to missing information on hazard zones. These findings are in line with observations made by Santos et al. (2016), who find that residents of municipalities in Leyte are often not aware of their individual vulnerability to natural hazards or about their houses being located in hazard- or no-build zones. The so-called "last-mile", meaning the issue of disseminating disaster-relevant information to households, is one crucial element of the overall functioning of disaster risk management or early-warning system. Failure to implement the flow of information can render the overall management system dysfunctional (Schlurmann and Siebert, 2011).

While the interrupted information flow has already become obvious in the section on sustainable management of natural resources (section 4.3), the gravity of this problem becomes even clearer regarding DRM. Households are most aware of DRM due to their experience with Yolanda and the direct benefits of Yolanda-related measures to households. The land-use planning intervention generally did not change awareness at the household level. This finding is also supported in several interviews by households and barangay captains requesting more training on DRM (HH-05I, HH-03I, BC-02I, MP-07I).

Table 13: Household-level models: treatment effects for DRM indicators

Outcome Variables	Intervention	Total sample	Active HHs	High training intensity	Region 8	Region 6	Intervention after 2012	Intervention before 2012
HH DRM strategies: reduction⁺	enh. LUP	-0.014	-0.017	0.014	0.045	(0.061)	(0.118**)	0.007
	enh. LUP + EnRD	-0.026	-0.038	-0.036	-0.055	0.076	(0.082**)	-0.047
HH DRM strategies: diversification⁺	enh. LUP	0.077	0.072	0.056	0.153*	(0.009)	(0.223*)	0.06
	enh. LUP + EnRD	0.006	0.028	-0.014	0.114	-0.147*	(0.119**)	-0.005
Community DRM strategies⁺	enh. LUP	0.067	0.063	0.023	0.112	(0.062)	(0.226**)	0.027
	enh. LUP + EnRD	-0.037	-0.03	-0.067	0.02	0.006	(0.058)	-0.049
DRM expenditures⁺	enh. LUP	-135.034	-314.367	0.044	69.922	(254.988)	366.198	124.086
	enh. LUP + EnRD	167.859	7.126	0.044	527.433*	105.977	571.073*	201.985
DRM expenditures (log)⁺	enh. LUP	-0.131	-0.178	0.423	0.495	(1.344**)	1.865***	0.41
	enh. LUP + EnRD	-0.286	-0.41	0.423	-0.512	0.694*	2.041***	-0.39
Informed of hazards	enh. LUP	0.027	0.103	-0.416	0.051	(-0.021)	(0.148*)	-0.024
	enh. LUP + EnRD	-0.083	-0.076	-0.416	-0.106**	0.083	(0.056)	-0.107
Awareness of hazards	enh. LUP	0.091	0.126	0.029	0.235***	(-0.03)	(0.393***)	0.096
	enh. LUP + EnRD	-0.128	-0.101	-0.085	0.000	-0.044	(0.271***)	-0.193*
Correct knowledge	enh. LUP	-0.036	-0.029	-0.022	-0.061	(-0.06)	(-0.134)	-0.027
	enh. LUP + EnRD	-0.035	-0.029	-0.033	-0.088	-0.104*	(-0.037)	-0.038

Note: Reported are average treatment effects on the treated (ATTs). Significance levels: * p<0.10, ** p<0.05, *** p<0.01. ATTs in parentheses mark weak matching models. Models include 2012 and 2016 data. Models marked with ⁺ only have endline information for the outcome variable. Treatment variables: enh. LUP: enhanced land-use planning. Enh. LUP + EnRD: municipalities which received other EnRD measures are excluded from control group (but not from intervention), ATT measures common effect of enhanced LUP and EnRD. Models 2-7 use subsamples. Region 6 and region 8 not calculated due to reduced sample size. Region 8: cities (1 case) excluded from the sample.

In sum, results show that, despite positive results at municipal level, and the importance of DRM for households, information on hazards does not seem to reach household level (*question IF3a*). Disaster risk-management measures are implemented at municipal level, but do not lead to improvements regarding DRM strategies and information about risks and hazard zones, and therefore do not lead to awareness at barangay and household level *(question IF3b)*. Findings by Mojtahedi et al. (2017) confirm that stakeholder-specific information measures on disaster risks are frequently insufficient, and they therefore call for more proactive engagement of stakeholders. Exceptions are the municipalities with intervention after 2012, which show positive effects at all levels. However, attribution of these effects to enhanced land-use planning is challenged due to external changes in disaster-risk legislation. Regarding awareness of climate change, we do not find effects at municipal level. At barangay level, certain improvements can be shown, but the effects are not robust across indicators, subgroups and treatment variables (*question IF3c*).

4.5 Impact field 4: "Local Governance"

4.5.1 Description of impact field

Land-use planning in the Philippines operates in a turbulent environment of contested local politics, bureaucratic administration, and relatively far from the affected population. How can land-use planning bridge the gap between the population and the public administration and enhance the quality of local governance?

Enhanced land-use planning interventions intend to make a positive change to several aspects of local governance. In this impact field, we assess several aspects related to changes in how municipalities are governed as well as changes in the processes of land-use planning and beyond. The SIMPLE intervention put a particular emphasis on the participative planning and inclusive development of the CLUP. Hence, we expect improvements in community participation and inclusion of people in local government processes. Through improved planning capacities and improved processes, we aim to measure changes in the perception of performance and responsiveness of local government officials to cater to population needs. Ultimately, we expect increased transparency and public accountability, which should lead to rising trust among households in the municipality.

Improved public services, such as improvements in infrastructure and social services, are related to the implementation and enforcement of the land-use plan. Therefore, we assess whether enhanced land-use planning has an effect on the availability as well as the perception of improved public services.

Land-use planning defines the rules for the use of land. It has a function to identify land-use conflicts and to provide conflict-management mechanisms. The survey measured several types of land-use related conflicts, such as conflicts between municipalities, between barangays within a municipality, between households, and between lower levels (household or barangay) and the municipal level. We assessed boundary conflicts as well as conflicts with regard to actual land use. Thus, we expect that the intervention reduces conflicts and improves conflict handling by LGUs.

In sum, we assess the following aspects of local governance: Participation and Inclusion; Performance and Responsiveness of Local Government; Improved Public Services (Infrastructure and Social Services); and Conflicts and Conflict Management.

4.5.2 Evaluation questions and operationalization

To examine the effects of enhanced land-use planning on local governance, we address following evaluation questions on the different aspects of local governance:

To what extent and in what ways did enhanced land-use planning improve local governance?

IF4a: To what extent did enhanced land-use planning increase participation in local government?

IF4b: To what extent did enhanced land-use planning increase the functioning and responsiveness of local governments?

IF4c: To what extent did enhanced land-use planning increase citizens' satisfaction and trust in local governments?

IF4d: To what extent did enhanced land-use planning lead to improved provisioning of public services and infrastructure?

IF4e: To what extent did enhanced land-use planning decrease conflicts and improve the handling of conflicts?

We present the outcome variables used in the impact assessment in Table 14 and how they relate to the evaluation questions in this impact field.

Table 14: Outcome variables for Impact field 4

Eval. questions	Level	Indicator	Description	Relation to EnRD indicators	Unit	Mean 2012	Mean 2016
Participation and inclusion							
IF 4a	Barangay	Index of barangay participation in LGU planning+	Index of Barangay participation in LGU planning based on several items measuring barangay participation	NRG indicator 3	scale 0-1	-	B: 0.471 (0.375)
IF 4a	Barangay	Number of barangay consultations per year	Number of Barangay consultations per year (average of 2 years prior to survey)	NRG indicator 3	metric	B: 3.456 (5.178)	B: 3.311 (2.810)
IF 4a	Barangay	Implementation of bottom-up-budgeting+	Implementation of bottom-up-budgeting in LGU from barangay level (BUB)	NRG indicator 3	1 – yes, 0 – no	-	B: 0.744 (0.437)
IF 4a	Barangay	Barangay captain participated in SIMPLE/eCLUP trainings	Barangay captain personally participated in SIMPLE/eCLUP trainings, mobilization events, discussions	Related to NRG indicator 3	1 – yes, 0 – no	B: 0.239 (0.427)	B: 0.227 (0.419)
IF 4a	Barangay	Barangay consulted residents about LGU/barangay issues in last year	Barangay consulted residents about LGU/barangay issues in the last year	Related to NRG indicator 3	1 – yes, 0 – no	B: 0.919 (0.273)	B: 0.957 (0.204)
IF 4a	Household	Participation of HH in planning activities	Index of participation of households in planning activities (planning, implementation, monitoring, evaluation)	Related to NRG indicator 3	scale 0-1	H: 0.254 (0.414)	H: 0.221 (0.379)
IF 4a	Household	Disclosure of planning and project information improved+	Index of perception that disclosure of planning and project information has improved	NRG_{Impl}	scale 0-1	-	H: 0.736 (0.257)
Performance and responsive local government							
IF4b; IF4c	Municipality	Ability of LGU to attract external funds improved+	Perception that ability of LGU to attract external funds has improved	NRG_{Impl}	scale -1 to 1	-	M: 0.760 (0.495)
IF4b; IF4c	Municipality	Ability of LGU to collect property taxes improved+	Perception that ability of LGU to collect property taxes has improved	Related to NRG indicator 2	scale -1 to 1	-	M: 0.600 (0.569)

Eval. questions	Level	Indicator	Description	Relation to EnRD indicators	Unit	Mean 2012	Mean 2016
IF4b; IF4c	Municipality	Index of enforcement of zoning ordinance / principles+	Index of enforcement of zoning ordinance and zoning principles	-	scale 0 to 1	-	M: 0.445 (0.299)
IF4b; IF4c	Barangay	Index of functioning of local government officials	Index of functioning of local government officials (responsiveness and performance of three levels of LGU officials)	-	Scale 0-1	B: 0.719 (0.193)	B: 0.722 (0.199)
IF4b; IF4c	Barangay	LGU helped in improving the living	Barangay captain perception of whether the LGU helped in improving the living conditions	-	1 – yes, 0 – no	B: 0.912 (0.284)	B: 0.843 (0.364)
IF4b; IF4c	Household	Index of functioning of local government officials	Index of functioning of local government officials (responsiveness and performance of three levels of LGU officials)	-	scale 0-1	H: 0.664 (0.216)	H: 0.647 (0.207)
IF4b; IF4c	Household	Quality of barangay processes	Index of ratings concerning the quality of barangay processes (sample based on only those households who had participated in any barangay consultation)	-	scale 0-1	H: 0.693 (0.197)	H: 0.678 (0.155)
IF4b; IF4c	Household	Trust index+	Trust index consisting of willingness and unwillingness to fulfil functions, and general trust	-	scale 0-1	-	H: 0.609 (0.162)
Improved public services (infrastructure and social services)							
IF4d	Barangay	Index: Public services/infrastructure improved (perception)+	Index of perception that several public services/social services/infrastructure have improved (perception)	Related to EnRD indicator 1	scale -1 to 1	-	B: 0.670 (0.354)
IF4d	Household	Index: Public services/infrastructure improved (perception)+	Index of perception that several public services/social services/infrastructure have improved (perception)	-	scale -1 to 1	-	H: 0.515 (0.305)
IF4d	Household	Agricultural extension services by LGU improved (perception)+	Perception that agricultural extension services by LGU have improved	-	scale -1 to 1	-	H: 0.345 (0.514)
IF4d	Household	Provision of drinking water by LGU improved (perception)+	Perception that access to drinking / potable water by LGU has improved	-	scale -1 to 1	-	H: 0.303 (0.580)

Eval. questions	Level	Indicator	Description	Relation to EnRD indicators	Unit	Mean 2012	Mean 2016
Conflicts and conflict management							
IF4e	Municipality	Existence of at least one conflict (except border conflicts)+	Existence of at least one type of conflict (except border conflicts)	-	1 – yes, 0 – no	-	M: 0.590 (0.494)
IF4e	Municipality	Boundary conflict with another municipality	Boundary conflict with another municipality	-	1 – yes, 0 – no	M: 0.444 (0.499)	M: 0.404 (0.493)
IF4e	Municipality	Boundary conflict between barangays within municipality	Boundary conflict between barangays within municipality	-	1 – yes, 0 – no	M: 0.495 (0.503)	M: 0.424 (0.497)
IF4e	Municipality	Improvement in border disputes with another LGU+	Perception that there is an improvement in border disputes with another LGU	Related to EnRD indicator 2	1 – yes, 0 – no	-	M: 0.333 (0.474)
IF4e	Municipality	Conflicts handled by LGU/barangay+	Conflicts are handled by LGU/Barangay	EnRD indicator 2	1 – yes, 0 – no	-	M: 0.600 (0.492)
IF4e	Household	Existence of at least one conflict+	Existence of at least one type of conflict	-	1 – yes, 0 – no	-	H: 0.092 (0.290)
IF4e	Household	Boundary conflict with neighbour	Existence of boundary conflict with neighbouring household	-	1 – yes, 0 – no	H: 0.139 (0.347)	H: 0.066 (0.248)
IF4e	Household	Conflicts handled by LGU/barangay	Conflicts are handled by LGU/Barangay	EnRD indicator 2	1 – yes, 0 – no	H: 0.044 (0.206)	H: 0.049 (0.216)

Note: Models marked with + only have endline information for the outcome variable. ° The relationship of empirical indicators with EnRD programme indicators as agreed with the BMZ: NRG = Indicator related to official NRG / SIMPLE component indicators; NRG_{Impl} = Indicator directly related to implementation logic of NRG; EnRD = Indicator related to official indicators of entire programme.

4.5.3 Results and discussion

In Table 15 to Table 18, we present results of the econometric analysis in line with the aforementioned four aspects of local governance. In each of the aspects, we computed treatment effects on a variety of indicators measured at municipal, barangay, and household level.

The aspect of community participation has been already a topic in Impact field 1. There, we have seen no significant effect of the intervention on people's participation in the development of the CLUP (Table 6 on page 40). At the levels of the barangay and household, the findings regarding people's participation are slightly different. We see a positive effect with regard to the participation of barangay captains in SIMPLE and eCLUP trainings; this finding is consistent in the total sample, among high treatment municipalities and for municipalities where the intervention started before 2012.

Table 15: Treatment effects for indicators related to aspect *participation and inclusion*

Outcome Variables	Intervention	Total sample	Active HHs	High training intensity	Region 8	Region 6	Intervention after 2012	Intervention before 2012
Barangay level								
Barangay captain participated in SIMPLE/eCLUP trainings	enh. LUP	0.156**	-	0.208**	-	-	-0.494**	0.138*
	enh. LUP + EnRD	0.117	-	0.199**	-	-	-0.272	0.183**
Barangay consulted residents about LGU/barangay issues in last year	enh. LUP	0.043	-	0.064	-	-	0.167	0.019
	enh. LUP + EnRD	0.087**	-	0.082	-	-	0.105	0.075
Number of barangay consultations per year	enh. LUP	0.545	-	1.038**	-	-	1.248**	0.694
	enh. LUP + EnRD	0.195	-	0.187	-	-	-0.835	0.283
Implementation of bottom-up-budgeting+	enh. LUP	-0.092	-	-0.103	-	-	0.063	-0.147*
	enh. LUP + EnRD	-0.083	-	-0.117	-	-	0.030	-0.165**
Barangay participation in LGU planning +	enh. LUP	0.064	-	-0.011	-	-	0.054	-0.032
	enh. LUP + EnRD	-0.027	-	-0.030	-	-	-0.081	-0.045
Household level								
Participation of HH in planning activities	enh. LUP	-0.025	-0.010	-0.017	-0.032	(0.057)	(0.091)	-0.049
	enh. LUP + EnRD	-0.095	-0.120*	-0.104*	-0.105	0.071*	(0.068)	-0.070
Disclosure of planning and project information improved+	enh. LUP	0.063*	0.051	0.072**	0.067**	(-0.004)	(0.102***)	0.052
	enh. LUP + EnRD	0.024	0.036	0.038	0.033	0.077***	(-0.052)	0.034

Note: Reported are average treatment effects on the treated (ATTs). Significance levels: * p<0.10, ** p<0.05, *** p<0.01. ATTs in parentheses mark weak matching models. Models include 2012 and 2016 data. Models marked with + only have endline information for the outcome variable. Treatment variables: enh. LUP: enhanced land-use planning. Enh. LUP + EnRD: municipalities which received other EnRD measures are excluded from control group (but not from intervention), ATT measures common effect of enhanced LUP and EnRD. Models 2–7 use subsamples. Models with missing ATT were not calculated due to restricted sample size. Region 8: cities (1 case) excluded from the sample.

However, we find the contrary, a significant negative effect, for municipalities that started only after 2012. In the total sample, the intervention also has a positive effect on barangay officials consulting residents about municipality/barangay issues. A positive effect on the number of barangay consultations per year is less marked, as we find it only in municipalities with high treatment intensity and in those municipalities that started intervention after 2012. We do not find any significant effect on bottom-up budgeting from the barangays; an exception are those municipalities that started the intervention early, where we even find a significant negative effect on bottom-up budgeting.

At the household level, there is no general effect on increased participation. In region 6, there is a positive effect of enhanced land-use planning combined with other EnRD programme components, but this effect is

negative for active households and for those households that are located in municipalities with high treatment intensity. However, we find a consistently strong positive effect of the intervention on the disclosure of planning and project information in most of the subgroups.

In summary, the results with regard to participation are a mixed bag. At the barangay level, there tends to be a positive effect, both with regard to the participation of barangay captains and the participation of people in barangay processes. The effect on bottom-up budgeting tends to be negative, but is only significant in the subgroup of municipalities where the intervention started early. At the household level, effects are rare, if not negative. An exception is the better disclosure of planning and project information.

Interpreting these results shows that participation reaches barangay, but not household level. The qualitative interviews confirm that public participation was a strong component in the early SIMPLE intervention, but the effort was reduced over time and the focus was put on the municipal level. Afterwards, participation tended only to reach down to the barangay level (DA-01 DA-02, DA-06, DA-07). Qualitative interviews reveal that people seem to be interested in participating more, at least to know more about land-use planning interventions (e.g. via public hearings or other events), and that they are interested in participating if the intervention affects their lives (CS-07, CS-02. CS-01, GA-03, HH-06C). On the other hand, participation is not always easy, because there are some people who are not interested (HH-04I, BC-04C, MP-16I, MP-16I, MP-17C). Several interviewees raise the point that, in order to enable them to make up their minds and to express their voices, peoples' organizations should be actively encouraged (CS-01, CS-04, CS-05, HH-04I, HH-06C). Respondents also mention other measures to increase participation, such as better information dissemination on developments and upcoming hearings or meetings (HH-03I, HH-05I, MP-17C), as well as more awareness-raising and trust-building to motivate participation and to show its importance in the planning process (CS-06, MP-03C, MP-09I, MP-14I). Moreover, improvements to the techniques of participation (such as FGDs and interviews on their concerns) are requested, including the offering of snacks, and modes of operating that avoid intimidation (MP-12C, MP-13I, MP-20I). Respondents also call for more participation at barangay level, and suggest that LGU officials should attend barangay meetings on planning matters (BC-03I, MP-03C, MP-10I); respondents also request more direct participation in project implementation to improve ownership and motivation (MP-07I, DA-02).

Qualitative evidence also points to substantial and purposive problems in the way participation is pursued in municipalities and barangays. There are reports that the planners' time pressures or financial constraints do not allow for proper participation, or that external consultants are hired who do not pursue participative elements (DA-07, MP-01C, MP-18C). Also, the way public hearings are conducted is heavily criticized in terms of selective (or no) invitations being issued, inadequate information given, processes hampering participation, and the perception that people's opinions are not listened to, and they are even made to feel intimidated (CS-04, HH-01C, HH-04I, MP-09I). There are also reports that political executives exert their influence on the way participation is conducted by either actively avoiding or limiting participation, or by influencing who is invited to participate in consultations (CS-02, CS-04, CS-05, DA-04, GA-03, HH02-I, MP-11I).

As a second aspect of local governance, we assess effects in the field of Performance and Responsiveness of Local Government. Functioning local governments raise taxes and external funds. However, we find a negative effect on the perceived ability of municipalities to raise external funds if enhanced land-use planning was carried out in combination with other EnRD programme components as well as for municipalities with high training intensity. With regard to the perceived ability to collect property taxes, we find no significant effect, except for municipalities receiving the intervention since 2012, where we find a significant negative effect. There is a significant positive effect on the enforcement of zoning ordinance in the municipalities, where the intervention started early, but not in the other groups.

Table 16: Treatment effects for indicators related to aspect *performance and responsiveness of local government*

Outcome Variables	Intervention	Total sample	Active HHs	High training intensity	Region 8	Region 6	Intervention after 2012	Intervention before 2012
Municipal level								
Ability of LGU to attract external funds improved+	enh. LUP	0.046	-	-0.006	-	-	-0.015	0.078
	enh. LUP + EnRD	-0.311***	-	-0.268***	-	-	-0.348	-0.302
Ability of LGU to collect property taxes improved+	enh. LUP	-0.218	-	-0.161	-	-	-0.645**	-0.003
	enh. LUP + EnRD	0.159	-	0.221	-	-	-0.426*	0.218
Index of enforcement of zoning ordinance / principles+	enh. LUP	0.045	-	0.105	-	-	-0.044	0.159*
	enh. LUP + EnRD	0.090	-	0.110	-	-	-0.054	0.122
Barangay level								
Functioning of local government officials	enh. LUP	0.017	-	-0.019	-	-	-0.097	-0.011
	enh. LUP + EnRD	0.010	-	0.030	-	-	-0.118	0.016
LGU helped in improving the living	enh. LUP	0.007	-	-0.038	-	-	-0.431	-0.032
	enh. LUP + EnRD	-0.039	-	-0.057	-	-	-0.260	-0.040
Household level								
Functioning of local government officials	enh. LUP	0.017	0.002	0.002	-0.004	(-0.033)	(0.019)	0.015
	enh. LUP + EnRD	-0.034*	-0.027	-0.034*	-0.044*	-0.037	(-0.039)	-0.028
Quality of barangay processes	enh. LUP	-0.030	0.013	-0.036	0.014	-	(0.007)	-0.028
	enh. LUP + EnRD	-0.040	0.005	-0.046*	-0.005	-	(0.022)	-0.052*
Trust in local government officials+	enh. LUP	-0.010	-0.011	-0.024	-0.023	-	(0.031)	-0.024
	enh. LUP + EnRD	-0.025*	-0.023	-0.029*	-0.022	-	(-0.005)	-0.024

Note: Reported are average treatment effects on the treated (ATTs). Significance levels: * p<0.10, ** p<0.05, *** p<0.01. ATTs in parentheses mark weak matching models. Models include 2012 and 2016 data. Models marked with + only have endline information for the outcome variable. Treatment variables: enh. LUP: enhanced land-use planning. Enh. LUP + EnRD: municipalities which received other EnRD measures are excluded from control group (but not from intervention), ATT measures common effect of enhanced LUP and EnRD. Models 2–7 use subsamples. Models with missing ATT were not calculated due to restricted sample size. Region 8: cities (1 case) excluded from the sample.

The analysis of barangay captains' perception of the functioning of local government does not lead to many insights as there is no significant effect. We also find no effect on their perception whether LGU helped in improving the living condition. At the household level, this index of functioning of local government officials is significant and negative. Enhanced land-use planning, combined with other EnRD components, show a negative effect on the perception of performance and responsiveness of local government officials. This finding is also confirmed among municipalities that received high-intensity treatment and in region 8. In the other subgroups, this negative relationship loses significance. If we look at the subtler indicator of trust towards local government officials, we can confirm this generally negative finding: a significant and negative

effect on trust towards local government officials if enhanced land-use planning was in combination with other EnRD programme components. This finding holds for the total sample and in municipalities with high treatment intensity. Among the smaller sample of households who have been participating in barangay consultations, we assess whether the perception of quality of barangay processes has changed. We find a slightly negative tendency in the perception of quality, which is significant among the municipalities that received high treatment intensity and in the subgroup of municipalities where the intervention started earlier than 2012.

In general, in the field of performance and responsiveness of local government, the intervention did not lead to a positive change, rather the contrary. The perceived ability to raise funds, and the perception of functioning of local government officials are negative, as is trust towards local government officials, and the perception of barangay processes. The only positive signal is the significant effect on the enforcement of zoning ordinance in longer-standing intervention municipalities.

What are the reasons for these surprising findings? In the qualitative study done to contextualize the results, we did not find any evidence that these findings are directly related to the intervention. In other words, we did not find anyone arguing that the intervention directly caused these negative findings. However, we find evidence that the intervention is indirectly related: the trainings, consultations, and participative elements of planning seem to have sensitized households to previously existing, underlying issues with local power structures (e.g. influence of land owners and personal interest of local government officials) and favouritism by political party affiliation (DA-02, DA-03, DA-05,GA-09). In the planning process, people seem to have received insights in planning details and budgeting, and, thus, are sensitized to such existing problems at the municipal level. Interviewees report that such existing problems with power structures hamper plan development, approval, and implementation (CS-01, CS-02, DA-02, DA-03, DA-05, GA-06, GA-09). There is evidence that some local executive officers exert political influence and interfere with the work of planners (CS-04, DA-01, DA-08, GA-08, MP-08I, MP-14I). Besides political interest, personal interest also seems to play a substantial role: several interviewees claim that there are issues with corruption, the personal interest of land owners, and other vested interests (CS-01, CS-04, CS-05, DA-04, DA-05, GA-04, GA-08, HH-03I). Also, there are reports that the process of developing and enacting the zoning ordinance is influenced or even stopped by influential persons (DA-04, DA-05, GA-04). Some interviewees also report that certain groups of people are systematically discriminated against in planning, plan implementation, and disbursement of funds, particularly due to political party affiliation, but also due to weak economic status: the poor and those dependent on large-scale land owners (CS-01, CS-04, CS-07, GA-08, DA-01, DA-05, HH-03I, HH-04I, HH-06C, BC-04C). This also seems to be a large problem in Yolanda relief projects (CS-01, CS-04, H-06C, BC-03I). It is unclear whether an increased awareness of households with regard to problems related to local misuse of power will ultimately make a difference in local governance. One thing is clear, though: that the intervention was not able to successfully address negative power structures in municipalities. Personal and vested interest as well as politicization seem to be a substantial problem at the local level, thwarting land-use planning efforts.

The third aspect of local governance is the provision of public services, which includes social services and infrastructure. In this field, we predominantly find positive effects. At the barangay and household levels, we find a positive effect with regard to the perception that public services and infrastructure has improved, except for a negative effect in the sub-group of municipalities that started the intervention late. This generally positive tendency is also confirmed by the perception that agricultural extension services have improved, as has the provision of potable water, where we find a positive significant effect in most of the subgroups.

Table 17: Treatment effects for indicators related to aspect *improved public services (infrastructure and social services)*

Outcome Variables	Intervention	Total sample	Active HHs	High training intensity	Region 8	Region 6	Intervention after 2012	Intervention before 2012
Barangay level								
Infrastructure improved+	enh. LUP	0.139**		0.125			-0.071	0.121
	enh. LUP + EnRD	-0.073		-0.056			-0.195*	-0.072
Household level								
Agricultural extension services by LGU improved+	enh. LUP	0.092*	0.072	0.119*	0.069	(0.128*)	(0.151*)	0.126**
	enh. LUP + EnRD	0.012	-0.022	0.042	0.048	0.174***	(0.005)	0.020
Public services / infrastructure improved+	enh. LUP	0.059*	0.038	0.098**	0.042	(0.153**)	(0.010)	0.072**
	enh. LUP + EnRD	-0.012	-0.011	0.032	-0.035	(0.128***)	(-0.081)	0.007
Provision of drinking water by LGU improved+	enh. LUP	0.185**	0.115	0.293**	0.182*	(0.266***)	(0.217*)	0.290**
	enh. LUP + EnRD	-0.013	0.015	0.011	-0.011	0.102*	(-0.079)	-0.010

Note: Reported are average treatment effects on the treated (ATTs). Significance levels: * p<0.10, ** p<0.05, *** p<0.01. ATTs in parentheses mark weak matching models. Models include 2012 and 2016 data. Models marked with + only have endline information for the outcome variable. Treatment variables: enh. LUP: enhanced land-use planning. Enh. LUP + EnRD: municipalities which received other EnRD measures are excluded from control group (but not from intervention), ATT measures common effect of enhanced LUP and EnRD. Models 2–7 use subsamples. Models with missing ATT were not calculated due to restricted sample size. Region 8: cities (1 case) excluded from the sample.

In sum, the intervention did have a positive effect on the planning and provision of infrastructure and public services. The consistent positive effects at the household level are somewhat surprising; it seems that people actually perceived a visible difference. Partially, we can also explain this finding by barangay project prioritization efforts, which were implemented by the intervention; interviewees in qualitative contextualization mention that the implementation of the barangay project with the highest priority was supported by the intervention, and villagers actively took part in implementing these priority projects (DA-01, DA-03). Several respondents mention that the existence of land-use plans may have positive effects on delivering public services. They mention, for example, that the existence of a plan makes it easier to identify particular infrastructure needs, that it facilitates the cooperation of LGUs and barangays, or cooperation between different LGUs, on support activities and infrastructure development, and that it facilitates applications for funds on road and livelihood projects (PP-06, GA-05, MP-16I, MP-12C).

In the fourth and last aspect of local governance, we assess the effects of the intervention on the existence of conflicts and on conflict handling. Consistently, at all levels, from household to municipal, we find that the intervention leads to an increase in conflicts, both boundary and land-use conflicts. We find a significant effect (i.e. increase) on boundary conflicts with another municipality as well as boundary conflicts between barangays within the municipality, consistently in all subgroups for enhanced land-use planning in combination with other EnRD programme components. Concerning the existence of other conflicts, unrelated to boundaries, we find a significant increase in the subgroups of municipalities having received many trainings and those where intervention started early.

Table 18: Treatment effects for indicators related to aspect *conflicts and conflict management*

Outcome Variables	Intervention	Total sample	Active HHs	High training intensity	Region 8	Region 6	Intervention after 2012	Intervention before 2012
Municipal level								
Boundary conflict with another municipality	enh. LUP	0.054	-	0.099	-	-	-	0.383**
	enh. LUP + EnRD	0.336**	-	0.485***	-	-	-	0.376**
Boundary conflict between barangays within municipality	enh. LUP	0.069	-	0.043	-	-	-	-0.046
	enh. LUP + EnRD	0.281*	-	0.389**	-	-	-	0.285*
Conflicts handled by LGU/Barangay+	enh. LUP	0.228*	-	0.093	-	-	0.146	0.131
	enh. LUP + EnRD	0.146	-	0.214	-	-	0.059	0.229
Existence of at least one conflict (except border conflicts)+	enh. LUP	0.153	-	0.112	-	-	0.106	0.256*
	enh. LUP + EnRD	0.201	-	0.258*	-	-	0.135	0.275*
Improvement in border disputes with another LGU+	enh. LUP	-0.110	-	0.003	-	-	-0.094	-0.090
	enh. LUP + EnRD	-0.279*	-	-0.274	-	-	-0.107	-0.312**
Household level								
Boundary conflict with neighbour	enh. LUP	0.045***	0.053***	0.034	0.029	(0.029)	(0.056)	0.040**
	enh. LUP + EnRD	0.037**	0.042***	0.043**	0.044*	(0.069**)	(-0.003)	0.041**
Conflicts handled by LGU/barangay	enh. LUP	0.009	0.011	0.009	-0.000	(0.051)	(-0.004)	0.008
	enh. LUP + EnRD	0.020	0.032*	0.024*	-0.013	0.066***	(-0.059)	0.028**
Existence of at least one conflict +	enh. LUP	0.034	0.047**	0.027	0.024	-	(0.009)	0.027
	enh. LUP + EnRD	0.059***	0.067***	0.058***	0.034	-	(-0.033)	0.060***

Note: Reported are average treatment effects on the treated (ATTs). Significance levels: * p<0.10, ** p<0.05, *** p<0.01. ATTs in parentheses mark weak matching models. Models include 2012 and 2016 data. Models marked with + only have endline information for the outcome variable. Treatment variables: enh. LUP: enhanced land-use planning. Enh. LUP + EnRD: municipalities which received other EnRD measures are excluded from control group (but not from intervention), ATT measures common effect of enhanced LUP and EnRD. Models 2–7 use subsamples. Models with missing ATT were not calculated due to restricted sample size. Region 8: cities (1 case) excluded from the sample.

At the municipal level, we also find a significant increase in the perception that boundary conflicts with other municipalities have not improved, both in the total sample and in the municipalities with long-standing intervention. At the household level, we can confirm this finding of an increase in conflicts: there is a significant effect (i.e. increase) in the existence of at least one conflict in the LGU, as well as increased boundary conflicts with households' neighbours, a consistent finding in most of the subgroups, except for those where intervention started late.

On the other hand, at the municipal level, we also find that conflict handling by the municipality or barangays has significantly improved through enhanced land-use planning, a finding which is significant only in the total sample. At the household level, the effect is weaker. Generally, on the perception of handling of

conflicts by the municipality or barangay, there is a positive tendency that is significant if municipalities did also receive support through other EnRD interventions in the subgroups of active households, for municipalities receiving high treatment intensity, in region 6, and in those municipalities where the intervention started early.

In summary, the findings on the aspect of conflicts and conflict handling give a clear picture. We find effects on an increased number of conflicts, coupled with a tendency for more active handling of conflicts by barangay and municipal governments.

Interpreting the results, we need to ask whether the enhanced land-use planning intervention triggered new conflicts. In most instances, this seems not to be the case. There seems to be a substantial number of hidden or not openly addressed conflicts at all levels: between municipalities, between barangays, and between households. Qualitative evidence suggests that during the process of land-use planning, hidden and latent conflicts become apparent and are openly discussed (RS-03, DA-07, PP-02, PP-04, PP-06, MP-09I). Sensitization of planners and increased awareness are among the reasons (DA-03). Other reasons given refer to a back-log of planning and the demarcation of exact boundaries using GIS, carried out for the first-time (GA-04, BC-04C, PP-06, MP-11I); respondents also mention the domination of land use through existing local power structures (e.g. personal or vested interest of influential land owners) as reason for conflicts (CS-04, CS-05, CS-06). A different set of reasons relates to the process of land-use planning aiming to define appreciated and deprecated land use, which triggers conflicts with the newly set-up land-use rules (as defined in CLUPs and zoning ordinances) or triggers conflicts due to mismatches between actual land use and the plans (DA-07, GA-01, RS-02, MP-03C).

The positive effects on conflict handling by municipalities and barangays are likely a result of the SIMPLE module on conflict handling. Respondents in the qualitative interviews pointed out that the provincial trainer pools were trained in conflict management (DA-01, DA-07), that LGU officers were trained in conflict management capacities for municipalities and barangays (DA-02, DA-03, DA-07), and that referral systems for conflicts were established that could not be solved locally (D-04). Generally, conflicts between municipalities seem to be more difficult to handle, as changes in municipal borders may have budgetary implications (DA-05).

We return to the evaluation questions of this impact field and sum up the main findings. Regarding question *IF4a* on improvements in participation in local government, we find no effect at municipal level, slight positive effects at barangay level and no to slightly negative effect at household level. We find a positive effect on the disclosure of planning and project information at household level. Qualitative evidence points to substantial problems in the implementation of participation at household and barangay level, ranging from participation not being properly pursued by officials to action being taken to deliberately limit participation. Hence, the intervention could not achieve the hypothesized positive effects as found in other studies on participatory land-use planning; Valencia-Sandoval et al., for example showed that participation can effectively increase "informing and impacting local policy related to sustainable community development" (2010: 70). As Puppim de Oliveira et al. show in their study on risk governance in Japan, participation may also positively influence effects in other impact fields. They conclude that "participation in planning processes is a powerful instrument to improve risk governance" (2016: 550).

Concerning question *IF4b* on effects relating to the functioning and responsiveness of local government, these tend to be negative in terms of the perceived ability to raise external funds and taxes, on the perception of households towards the functioning of local government officials, and on the perception of the quality of barangay processes. Among municipalities where the intervention started early, we find an improved enforcement of zoning ordinance principles. Similarly, on question *IF4c* we find a tendency for citizens' trust in local governments not to increase, but to decrease. Qualitative evidence points to underlying issues with regard to local power structures as well as local political elites with personal and vested interest exerting influence on planning, approval, and implementation of plans. Such negative effect on trust within communities can also lead to communities having less trust in development partners; Labonne et al. showed, for example, that trustworthiness of LGUs is a criterion for attracting external funds (2007: 14). In his study on community participation models, Swapan (2016) shows that lack of trust in the planning system is linked

with individual's attitude towards participation. Hence, active engagement of stakeholders and proper participation of communities may contribute to building trust and confidence with local governments. The issue of particular interests and patrimonial structures has been confirmed by Gera (2016) in her study on environmental governance in the Philippines constraining accountability and legitimacy of representation, thus, ultimately, hampering development impact.

Regarding the aspect of public services and infrastructure (*IF4d*), we find consistently positive effects on the provision of infrastructure and public services, including agricultural extension services. Concerning question *IF4e* on decreased conflicts and improved handling of conflicts, we find an increased number of boundary conflicts, but also of other conflicts. On the other hand, we find, by tendency, a positive effect on the capacity of LGUs to more actively handle conflicts. Qualitative evidence also confirms efforts and improvements in conflict handling. Hence, we find both an increased number of conflicts and improved conflict handling by LGUs. It needs to be seen whether the increased capacities in conflict handling lead to a reduction in conflicts in the long run. It is important to note, as a cross-cutting finding in this impact field, that conflicts related to land-use planning are linked to the issues of land-use rights and tenure security and there is thus a need to actively address this matter. Evidence also points to discrimination against economically disadvantaged and landless households with regard to participation. With regards to conflicts, a study on land-use planning in Laos showed that, without addressing land-use rights and tenure security, conflicts related to land-use planning may be even disadvantageous for those rural populations who have no formal land titles (Broegaard et al., 2017).

4.6 Impact field 5: "Welfare"

4.6.1 Description of impact field

Land-use planning is supposed to be made for the people. The goal of all regulations, in the long run, is supposed to make life fairer, reduce poverty, allow for sustainable growth, and boost prosperity. As the ToC shows, interventions under the umbrella of enhanced land-use planning build the basis to improve people's lives: improved DRM increases resilience, improved management of natural resources secures access to natural resources in the future, and an improved local governance leads to better public services and reduced land conflicts. Improved planning quality additionally has the power to attract funds to municipalities and barangays, to be more effective in setting priorities, to adjust infrastructure investment to people's needs, and to stimulate economic growth. Improved codification of land-use rights reduces households' risk of losing land, and conservation and livelihood programmes provide direct benefits to households. If these mechanisms hold, enhanced land-use planning can – in the long term – increase welfare and, if interventions are well targeted, reduce poverty.

4.6.2 Evaluation questions and operationalization

To examine the effects of enhanced land-use planning on welfare we address following evaluation questions:

To what extent and in what ways did enhanced land-use planning lead to improved welfare of households and communities?

- **IF5a:** To what extent did enhanced land-use planning decrease the risk of losing land, especially for disadvantaged households?
- **IF5b:** To what extent did enhanced land-use planning increase economic welfare at household level?
- **IF5c:** To what extent did enhanced land-use planning decrease poverty?
- **IF5d:** To what extent did enhanced land-use planning increase self-assessed well-being?

Table 19: Outcome variables for Impact field 5

Eval. questions	Level	Indicator	Description	Relation to EnRD indicators	Unit	Mean 2012	Mean 2016
IF 5a	Household	Land threat+	Indicates if respondent reports any threat to lose or have to give away any of his or her land.	-	1 – yes, 0 – no.	-	H: 0.303
IF 5b	Household	Asset index	Wealth based on assets.	-	0-1	H: 0.322 (0.220)	H: 0.359 (0.221)
IF 5b	Household	Income	Income per capita and day.	Related to EnRD indicator 3	PPP-$	H: 3.360 (4.562)	H: 4.367 (5.987)
IF 5b	Household	Consumption+	Consumption per capita and day.	-	PPP-$	-	H: 4.044 (3.240)
IF 5c	Household	Improved sanitation+	HH has access to improved sanitation facilities.	-	1 – yes, 0 – no.	-	H: 0.829 (0.376)
IF 5c	Household	Improved water	HH has access to an improved water source.	-	1 – yes, 0 – no.	H: 0.809 (0.393)	H: 0.975 (0.156)
IF 5c	Household	Strong walls	HH has walls made from strong materials.	-	1 – yes, 0 – no.	H: 0.664 (0.472)	H: 0.426 (0.495)
IF 5c	Household	Poverty headcount	HH has a per capita income below regional poverty line.	-	1 – yes, 0 – no.	H: 0.66 (0.48)	H: 0.61 (0.49)
IF 5d	Household	Well-being	Subjective rating (0-10) of well-being by the respondent.	Related to EnRD indicator 3	0-10	H: 6.413 (2.280)	H: 5.532 (1.887)

Note: Regional poverty lines: 2012: Region 6: 2.8; Region 8: 3.33. 2016: Region 6: 2.81; Region 8: 3.37. Models marked with + only have endline information for the outcome variable. ° The relationship of empirical indicators with EnRD programme indicators as agreed with the BMZ: EnRD = Indicator related to official indicators of entire programme.

Table 19 gives an overview of the outcome variables used as indicators in this impact field. For a broad overview, as an indicator for tenure security we use a self-assessment of the risk of losing land by pressure from any third party. Furthermore, we use three different welfare indicators: asset-index, household income (per capita and day), and household consumption (per capita and day). A description of the calculation of the asset index and of the income and consumption aggregate can be found in Annex 7.2.5. Asset index and income rely on 2012 and 2016 data, for consumption only 2016 data is available. To estimate the effect on poverty, we apply different monetary and non-monetary indicators: poverty headcount measuring the share of households with a per capita income below the regional poverty line; additionally, indicators on housing quality, and improved sanitation and water. To measure the effect of enhanced land-use planning on the subjective perception of living quality, we use a subjective indicator of the respondent's perceived well-being.

4.6.3 Results and discussion

No robust effect on self-assessed *tenure security* can be identified. Also, none of the subgroups shows significant treatment effects; the exception is the subgroup where the intervention started after 2012, which shows a significantly reduced reported risk of losing the land.

Looking at the *welfare effects* of enhanced land-use planning, we do not find significant effects, neither for the total sample, nor for active households and those under high training intensity. Separating the sample by region, we find the same non-existent effects of enhanced land-use planning in region 8 and for late intervention after 2012. For region 6, however, several effects are significant: enhanced land-use planning

increases the income, and this effect is even stronger if the intervention was in combination with other EnRD programme components.

Table 20: Household-level models: treatment effects for welfare indicators

Outcome Variables	Intervention	Total sample	Active HHs	High training intensity	Region 8	Region 6	Intervention after 2012	Intervention before 2012
Land threat+	enh. LUP	-0.111	-0.109	-0.113	-0.056	(-0.153)	-0.255**	-0.112
	enh. LUP + EnRD	0.051	0.056	0.066	0.03	0.047	0.024	0.055
Asset index	enh. LUP	0.032	0.032	0.027	0.02	(0.044)	(-0.062)	0.021
	enh. LUP + EnRD	0.005	(-0.012)	(0.002)	(-0.022)	-0.009	(-0.022)	0.002
Log income	enh. LUP	0.006	0.001	0.046	-0.128	(0.289**)	(-0.489*)	0.022
	enh. LUP + EnRD	(0.188)	(0.199)	(0.155)	(-0.346)	(0.361***)	(-0.346)	0.409***
Log consumption+	enh. LUP	0.025	0.028	0.025	-0.041	(0.274***)	(-0.05)	0.005
	enh. LUP + EnRD	0.043	0.047	0.068	0.024	0.134*	(-0.027)	0.065
Improved sanitation+	enh. LUP	0.046	0.058	0.007	0.046	(-0.082)	(-0.018)	-0.005
	enh. LUP + EnRD	0.045	0.054	0.057*	0.062	-0.103**	(-0.007)	0.051*
Improved water	enh. LUP	0.004	0.003	0.001	-0.003	(0.005)	(-0.044)	0.015
	enh. LUP + EnRD	-0.002	(-0.002)	(0.028)	(0.01)	0.025	(0.01)	0.026
Strong walls	enh. LUP	0.056	0.041	0.065	0.052	(-0.04)	0.072	0.066
	enh. LUP + EnRD	0.033	(0.042)	(-0.067)	(0.059)	-0.035	0.059	-0.038
Poverty headcount	enh. LUP	0.001	-0.013	0.003	0.079	(-0.151**)	(0.251*)	-0.001
	enh. LUP + EnRD	-0.053	(0.002)	-0.009	(0.029)	-0.186***	(0.14**)	-0.143**
Well-being	enh. LUP	0.029	-0.022	-0.069	(0.008)	(-0.034)	-0.043	-0.091
	enh. LUP + EnRD	(-0.208)	(-0.215)	(-0.445)	(0.195)	-0.668**	0.195	-0.357**
Land threat+	enh. LUP	-0.111	-0.109	-0.113	-0.056	(-0.153)	-0.255**	-0.112
	enh. LUP + EnRD	0.051	0.056	0.066	0.03	0.047	0.024	0.055

Note: Reported are average treatment effects on the treated (ATTs). Significance levels: * p<0.10, ** p<0.05, *** p<0.01. ATTs in parentheses mark weak matching models. Models include 2012 and 2016 data. Models marked with + only have endline information for the outcome variable. Treatment variables: enh. LUP: enhanced land-use planning. Enh. LUP + EnRD: municipalities which received other EnRD measures are excluded from control group (but not from intervention), ATT measures common effect of enhanced LUP and EnRD. Model 2–7 are subsamples. Region 6: adjusted matching (took out city/ Yolanda), effects are robust.

At the same time, there is a positive effect on consumption in this region. Both, in combination, might lead to increased savings or investment by those households. While these positive effects on income in region 6 have to be interpreted with care due to low PSM quality, results of this region seem to be driving a positive

income effect for the entire subgroup of municipalities whose intervention started before 2012. In this subgroup, we find a positive and even larger positive income effect for the combination of enhanced land-use planning with other EnRD components.

Looking at non-monetary *poverty* indicators, the picture is similar. Results show almost no treatment effects over all subgroups. The exception is a small, but significantly positive, effect on sanitation for municipalities with high intervention intensity, which is supported by a similar effect for the group with intervention before 2012, if enhanced land-use planning is combined with other EnRD interventions. Region 6, on the contrary, shows a negative treatment effect for this indicator. For poverty headcount, we find a decrease in poverty in region 6; these findings are again mirrored by similar results for the group of municipalities with long-standing intervention.

Results of the indicator "*self-assessed well-being*" show a similar pattern – but in the opposite direction. In region 6 and in municipalities with intervention before 2012 we find a significantly reduced self-assessed well-being if the intervention of enhanced land-use planning was combined with other EnRD components. In all other subgroups, no significant effects are found.

In interpreting these positive effects on welfare measures in region 6 and in municipalities with intervention after 2012, one needs to look at the context. Insignificant effects on welfare in the full sample and region 8 were not surprising with regard to the causal mechanism of this impact field. It is at the end of the causal chain, effects are indirect and long term, and results on preceding impact fields have shown to be rather mixed and not transmitted to the household level. Delays in approval and implementation of CLUPs aggravate this (GA-05). Also, in qualitative interviews households do not see the positive effect that land-use planning is supposed to have on their lives (HH-01I). Positive effects in region 6 are therefore rather surprising, and results for those municipalities with intervention after 2012 seem to be mainly driven by region 6 results. A possible explanation might be the strong, rapid and dynamic urbanization of Negros Island (DA-06), which might lead to improved infrastructure and income, but might even explain the negative subjective perception of well-being.

Enhanced land-use planning therefore seems not to be able to measurably improve people's well-being within a few years, as it is an indirect and long-term intervention in general, and suffering from missing transmission of effects to the household level. Possible changes can be overlaid by external development effects such as rapid urbanization, which were not captured by the statistical matching procedure.

With regard to their welfare, households even see negative implications. The definition of hazard zones and resulting relocation of households is one of the main topics brought up by households when talking about land-use planning. While households do see the benefit of relocating from hazardous zones, the often inadequate relocation areas are seen as a severe threat to their livelihoods (HH-02I, HH-03I, CS-01).

In sum, results do not show robust effects on self-assessed tenure security *(question IF5a)*. In addition, no robust effects on welfare indicators (*question IF5b*) are identified in the total sample; region-specific positive impacts seem to be driven by further, regional developments. We cannot draw general conclusions from measured effects on monetary and non-monetary poverty indicators *(question IF5c)*, as positive effects are limited to varying subgroups and are insignificant in the total sample. Results on self-assessed well-being remain likewise vague (*question IF5d*). These weak results regarding welfare effects of enhanced land-use planning again reflect the finding of disturbed transmission of the intervention to the household level.

4.7 Cross-sectional topic: policy and innovation diffusion

This section investigates the effects of the intervention from the perspective of policy and innovation diffusion. It elaborates on the first part of Cross-sectional Topic 1 by addressing the question: "What are relevant findings with regard to the sustainability of the intervention and the continuity of intervention benefits with regard to *innovation diffusion*?" Based on an analysis of spatial clustering and qualitative interviews, we assess whether control municipalities improved land-use planning due to the intervention. An understanding of policy diffusion is crucial to evaluating the sustainability of development cooperation. Wide adoption

of a policy indicates that it constitutes an improvement over previous practices, is easily applicable in other contexts, and is visible beyond the intervention (cf. Rogers, 1995). In this sense, diffusion indicates sustained effects of interventions.

Broadly following Simmons et al. (2006), we define diffusion as the process by which the decisions of political, administrative, or societal actors in a geographical unit are systematically influenced by choices in other geographical units. Hence, diffusion refers to the spreading of innovation horizontally from one unit to another on the same administrative level, or vertically between super- and subordinate levels (Elkins and Simmons, 2005; Gilardi, 2012).

The analysis of patterns of diffusion complements the analysis of the effects of enhanced land-use planning on change of land use, improved local governance, disaster risk management, sustainable natural resource management, and welfare. It does so by estimating to what extent outputs of the enhanced land-use planning intervention diffuse from intervention municipalities to municipalities in the control group. Diffusion is desirable for policy-makers as it indicates a spread of intervention effects to units that are not directly targeted. On the other hand, diffusion poses a challenge, as it might lead to an underestimation of intervention effects in quasi-experimental designs. This section focuses on diffusion as a substantial phenomenon. For discussions of diffusion as a challenge for causal inference see section 3.3.3 and Appendix 7.1.5.

Policy diffusion research distinguishes three common mechanisms of diffusion. First, policy diffusion via the mechanism of learning primarily depends on the "success" of a given policy in a political unit. A successful policy is expected to lead to the adoption of the policy by other political units. Second, diffusion through emulation follows the "logic of appropriateness" (Lee and Strang, 2006). Policies will be emulated when they achieve a high degree of acceptance among other actors. Third, diffusion through competition takes place when the adoption of a policy serves a strategic purpose to improve one's own position.

There are three reasons to assume that diffusion occurred in this case of this intervention. The *first* regards the visibility of the innovation. When the Philippine–German Cooperation implemented SIMPLE in a number of municipalities in the first phase of the intervention, it aimed to raise awareness of innovation in land-use planning. This, in turn, increased the chance of diffusion because the innovation became more widely known and understood, as well as perceived as important.

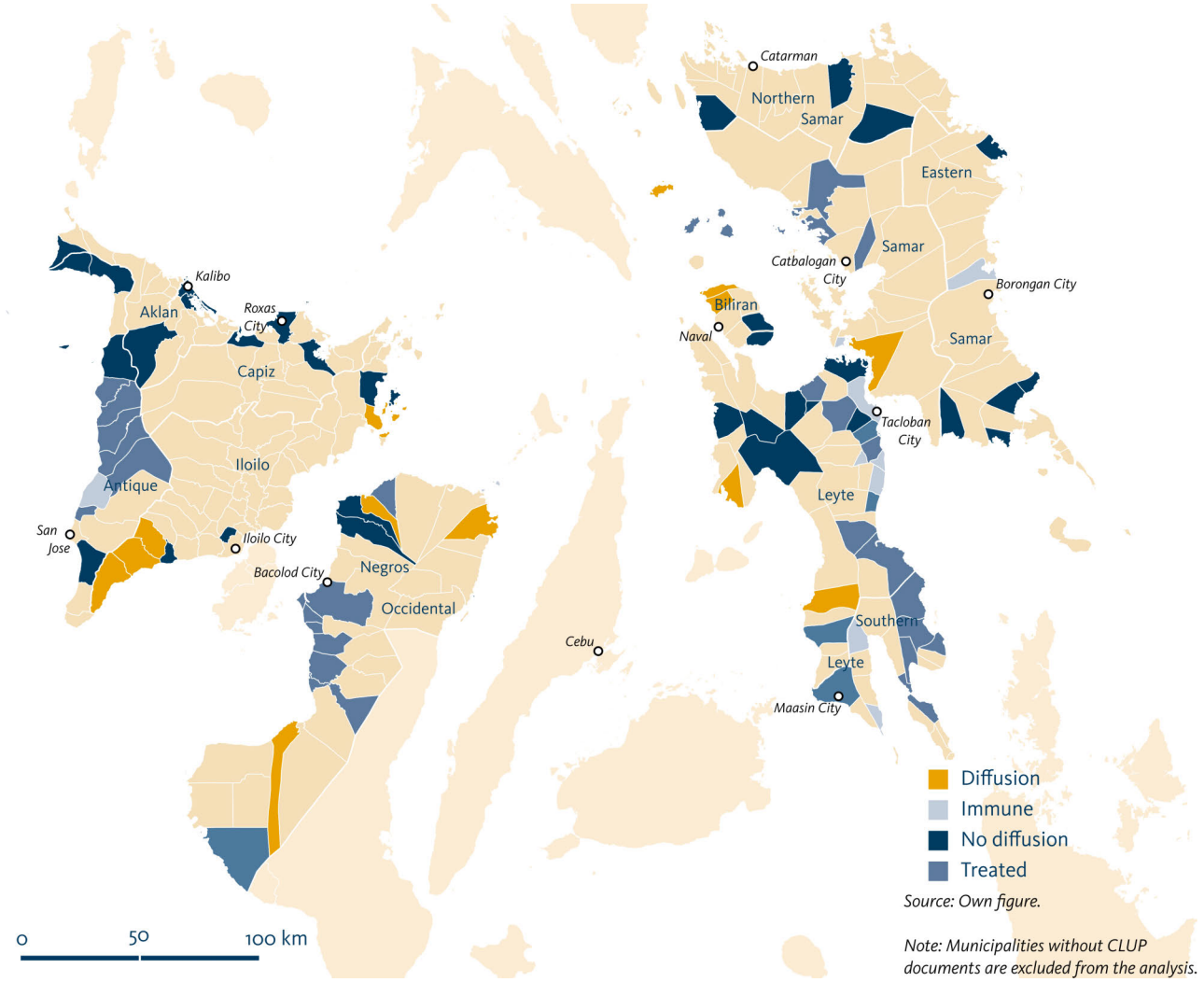
The *second* reason relates to the costs of adaptation. The intervention in its second phase provided the HLURB and the provinces of region 6 and 8 with capacities for efficiently replicating SIMPLE with less involvement by GIZ. Hence, the intervention-trained planning officers, who subsequently formed a trainer pool to provide support to non-intervention municipalities, aimed to implement SIMPLE on their own initiative (DA-07). Moreover, planning officers were equipped with maps, plotters, plotter printing machines, and GPS, which allowed them to provide technical assistance to municipalities willing to adopt SIMPLE (DA-01, PP-06). The creation of trainer pools and the provision of technical equipment was aimed at strengthening the sustainability of the programme (DA-01). In summary, capacity development can lower the costs of adaptation and thereby facilitate the spread of innovation.

The *third* reason to assume that the intervention diffused is that the administrative system is designed to give municipalities leeway for policy-making in the field of land-use planning. Although local political authority is usually limited in unitary states such as the Philippines, the decentralization programme in the 1990s has shifted some political authority from the centre to municipalities. Sub-national expenditures rose from 1.7% to 3.4% of Gross National Product (GNP) between 1990 and 2002 (Asian Development Bank and World Bank, 2005) and a substantial number of personnel were transferred from central government to LGUs. The policy area of interest in our analysis, i.e. land-use planning, was among those areas affected by the 1991 Local Government code (GIZ, 2011). The political leeway opened up by decentralization enables local leaders to adopt successful policies from other political units as well as to compete for good solutions. In summary, the fact that GIZ designed the intervention with diffusion in mind, and that diffusion is feasible within the administrative system of the Philippines, provide good reasons to assume that diffusion occurred.

Figure 11 shows the geographical distribution of training material (available or not) conditional on the intervention (intervention or control). Were no diffusion to have occurred, we would expect training material

only in municipalities where the intervention took place, and no material where no intervention took place. However, in line with our hypothesis that the intervention spread among municipalities, we also find municipalities where training material is available although no intervention took place (called "Diffusion" in Figure 11).

Figure 11: Geographical distribution of training material conditional on the intervention



Source: Own figure.

Note: Municipalities without CLUP documents are excluded from the analysis.

In addition, we also find municipalities where the intervention took place but where municipal officers reported no available training material (called "Immune" in Figure 11). This finding provides a first hint that intervention benefits diffused among municipalities.

To investigate whether and how the intervention diffused among municipalities, we combine quantitative and qualitative evidence. Spatial clustering of intervention effects provides statistical evidence that the intervention spread between units. Qualitative evidence from interviews gives insights into the mechanisms of diffusion. The following discusses the quantitative and qualitative results in turn.

Based on the preliminary results presented in Figure 11, we test for spatial clustering based on Moran's I (for a more detailed discussion see section 7.1.5). Moran's I is a statistical measure that describes the relationship of land-use plan quality among municipalities. A positive value indicates clustering, i.e. that municipalities are similar to their neighbours with regard to the quality of their land-use plans. A negative value indicates a chessboard-like pattern. The test returns a Moran's I of 0.23 on a possible range between -1 and 1.02, which shows that spatial autocorrelation among municipalities with regard to the quality of land-use

plans exists.[20] This statistical result is an indication of diffusion. However, it does not provide evidence as to what mechanism – related to diffusion or not – is responsible for the observed pattern. To investigate whether and which mechanisms of diffusion led to spatial clustering, we draw on qualitative evidence gathered in interviews.

Municipalities exchange information on land-use planning through at least two channels. First, MPDOs are in frequent communication with the provincial planning office and frequently meet there (DA-01, DA-07). Second, municipalities exchange information among one another (DA-07). In contrast to exchange through provincial planning offices, bilateral exchange allows for diffusion across provinces.

It was not until implementation had been ongoing for a while, however, that non-intervention municipalities requested SIMPLE trainings from GIZ. For instance, a non-intervention municipality in Samar requested assistance in developing CLUP after it became aware of the intervention in a neighbouring municipality in Leyte, where the intervention had started early on (DA-01). Only separated by a small strait, the geographical proximity facilitated exchange of information as well as training attendance. In addition, the efforts of individual MPDOs "who were really passionate to have their land-use plans updated" (DA-01) was crucial in this early phase of implementation.[21] Once non-intervention municipalities had approached GIZ, they were informed about ongoing trainings (DA-01). In the course of implementation, some non-intervention municipalities increasingly perceived SIMPLE as successful and attractive (DA-02). Some treated municipalities provided training and assistance to municipalities in the control group (MP-10I). In summary, this evidence shows that diffusion occurred. In light of our above definition, learning was one of the main mechanisms of diffusion.

The interviews also provide hints that competition among municipalities led to diffusion. For instance, the small province of Southern Leyte became aware of the implementation of SIMPLE in bordering Leyte province early on. With combined efforts, municipalities and the governor managed to convince GIZ to organize several big workshops for all 19 municipalities of the province, replicators, and non-treatment municipalities. GIZ also co-financed these workshops (DA-07). The combined efforts of authorities and planners in Southern Leyte in response to the developments in the bigger neighbouring province is an indication of competition. A similar example is Negros Occidental. Here, it was comparatively easy for GIZ to respond to requests, since some municipalities had already been treated (DA-07).

The trainer pools at the provincial level were an important tool to extend the reach of SIMPLE, even beyond the treated municipalities. Those participating in the training at provincial level were sent to municipalities to provide technical services (DA-03). Whereas the trainer pools were originally intended to be exclusively composed of provincial planning staff, MPDOs from municipalities also took part (DA-03, DA-05). Trainer pools operated according to their own rules, without being much restrained by GIZ. Consequently, trainers were not bound by what was defined as an intervention group, and provided assistance to non-intervention municipalities that requested their services (DA-01, DA-02, DA-03, DA-05). For instance, a municipality in Southern Leyte with a highly committed MPDO with regard to formulating CLUP serves as a good example for a non-intervention municipality that benefitted from the provincial-level SIMPLE implementation (DA-03).

Nonetheless, trainer pools did not operate unless at municipalities' request (DA-07). Hence, the initiative lay with the municipalities. This shows that the adaptation of SIMPLE in developing the CLUP in non-intervention municipalities was not a result of top-down implementation but rather an effort of non-treatment municipalities that were eager to process their own CLUP.

The main activities of trainer pools took place in 2011 and 2012 (DA-01, DA-03). The willingness and availability of trainers was crucial in providing municipalities with the requested support (DA-02). Provincial

[20] *As Moran's I assumes a constant mean, a violation of this assumption might lead to false result. To test for this, we include trends based on the longitude and latitude of municipal halls. Even if we include these trends, the results remain substantially unchanged.*

[21] *Individual-level factors such as personal effort influence patterns of diffusion but are neither available for all municipalities nor easy to operationalize. Hence, we cannot include them in a quantitative comparative analysis.*

planners were faced with a trade-off between providing support to municipal planning staff and their own planning work. As it turned out, support activities were less and less implemented over time (DA-01, PP-06).

The impact of typhoon Yolanda was a turning point. For instance, training activities in Samar stopped when trainers returned to their bases to engage in reconstruction (DA-03). After Yolanda, the organization of training activities changed. Specifically, in region 8, so-called "learning sites" (DA-03) emerged. Municipalities, e.g. four municipalities in Leyte, invited rather than visited MPDOs to be able to support local reconstruction and at the same time provide training. Thus, the impact of typhoon Yolanda changed the way in which training material spread among municipalities (compare Figure 11).

GIZ also supported diffusion later in the intervention. On the one hand, it assisted efforts by municipalities eager to update their CLUPs at their own expense by providing financial support for HLURB workshops (DA-07). On the other hand, GIZ included SIMPLE in the concept of provincial trainings, using BMUB-funded programmes such as REDD+ ("Reducing Emissions from Deforestation and Forest Degradation") as vehicles (DA-07). In general, municipalities situated in provinces where other municipalities had already experienced SIMPLE had a higher chance of getting support by GIZ in adopting enhanced land-use planning even though they were not originally selected for intervention (DA-07). Travel time thus seems to be a valid indicator of diffusion. Even though GIZ supported diffusion, it only very seldom provided direct support – in the form of training, material, or workshop invitations – for municipalities in the control group. Yet, municipalities in the control group were able to gain support comparable to intervention municipalities, e.g. by drawing on the trainer pool (DA-07). This, however, can be interpreted as diffusion, rather than an extension of intervention, since it crucially depended on own initiative.

HLURB and DILG were crucially involved in diffusion processes (DA-02, DA-03, DA-05, DA-07). First, HLURB played a central role in developing eCLUP guidelines, which became obligatory for the whole country. Second, HLURB supported information transfer by providing training. Moreover, DILG, in close cooperation with HLURB, developed guidelines to adapt CDP to CLUP. HLURB and DILG thus acted as vehicles for the diffusion of information (DA-05).

A typical process of implementing SIMPLE in non-treated municipalities was as follows. Having received training in learning sites, MPDOs and their technical staff gained access to barangay-level data, including the Climate and Disaster Risk Assessment (CDRA). Following data collection, MPDOs accessed the services of the province and HLURB through the League of Land-Use Planners. HLURB, through its relation to provincial-level technicians and technical know-how on eCLUP, provided technical assistance. However, neither the League of Planners nor HLURB provided funds. Municipalities had to finance venue registration and workshops. After having attended eCLUP-related workshops, municipalities were able to get their work reviewed through the learning sites (DA-03).

Based on quantitative and qualitative evidence, we can conclude that intervention effects diffused among municipalities through the mechanisms of competition and learning. Diffusion is not exclusively a problem for valid causal inference. Beyond the methodological view, the spread of the intervention beyond those municipalities originally in the intervention enhances the sustainability and scale of the intervention (Cross-sectional Topic 1). The spatial analysis of the quality of land-use plans and the qualitative interviews provide congruent evidence that plans spread beyond those units directly targeted by the intervention. Local development interventions can thus have global effects.

4.8 Cross-sectional topic: continuity of intervention benefits, national scaling-up, and German contribution

Another aspect elaborated on Cross-sectional Topic 1 on the *sustainability* and continuity of the intervention benefits addresses the question: "What are relevant findings with regard to the sustainability of the intervention and the continuity of intervention benefits with regard to *scaling-up and replication* of land-use planning processes?" In this section, we also address the specific question of what the contribution of

the German Development Cooperation was towards advancements in enhanced land-use planning and in the process of national scaling-up, as well as in the development and roll-out of the eCLUP guidelines.

The intervention contributed to institutional and technical advancements in order to ensure the sustainability of the intervention. On one hand, these are advancements at local and provincial levels in the intervention regions contributing to the continuity of intervention benefits. On the other hand, the intervention contributed to the national scaling-up into national policy-making in order to ensure the sustainability of the intervention's goals (vertical uptake).

We identified the following institutional and technical advancements in land-use planning in the intervention regions at sub-national level:

From an institutional perspective, on sub-national level, the SIMPLE approach by the Philippine–German Cooperation had established a capacity development scheme. With regard to capacity development, interviewees specifically mention the organization of trainings, conferences, and study trips to be beneficial for the development of the planning approach (CS-02, RS-03, DA-04, GA-01, PP-02, MP-06I, MP-08I, MP-09I, MP-14I). GIZ was furthermore involved in the formation of the trainer pools at provincial level (DelVecchio, 2015). The implementation of the training scheme ("train-the-trainer") to enable a continuous support for the intervention was successful during the implementation (RS-02); however, it seems to be under-equipped to handle the actual demand for technical trainings required by all municipal planners after the intervention. In addition, not all arranged groups of provincial trainers have continued their work following the implementation (PP-06, MP-01C, MP-03C).

From a technical perspective, at sub-national level the SIMPLE approach by GIZ introduced a systematic process of data collection, especially from the barangay level, into the planning process of the CLUP, and capacitated municipalities in a systematic use of GIS to produce digitized maps. It was partly referred to as having supplied the methodology behind the enhanced land-use planning intervention (GA-04). In particular, the use of GIS technology is widely accepted and considered a helpful addition to the standard operation procedure of enhanced land-use planning (MP-01C & MP-03C, PP-02). Despite critique on the ease of obtaining the necessary sectoral plans and information, this integrated planning concept receives positive appraisal among provincial planning staff (PP-42, 43, 44, GA 18). Furthermore, financial support provided in the capacity development scheme, as well as the supply with logistics and technical equipment, are considered helpful by project recipients (RS-03, DA-04, GA-12, PP-04, PP-05, MP-09I, MP-14I).

In summary, from the technical perspective, the German contribution has been to develop capacity development in planning techniques (predominantly GIS-based planning) and a change in land-use planning from a sectoral to a comprehensive approach (ridge-to-reef) as well as the planning of all municipal ecosystems. For the first time for many municipalities, the intervention systematically included the planning of public land and forest land within municipal boundaries, land which is administered by the DENR.

Through the process of national scaling-up, several institutional and technical advancements were established at national level:

In terms of institutional advancements, we identified that the support by GIZ helped to incorporate other crucial partners and other governmental agencies to the process of land-use planning (DA-04, GA-05, PP-06). In particular, the process of drafting the eCLUP guidelines has been described as a collaborative effort by various governmental agencies; among them DILG and DENR (RS-03, GA-02, GA-04, GA-05). The process was side-lined by the development of supplemental guidebooks and materials by the DILG (GA-04). These examples show that the inter-sectoral approach of the intervention was able to contribute to improvements in inter-agency cooperation; however, frictions continue to exist, for instance in the coherence of planning processes, competition over resources; also, different definitions and criteria remain (CS-02, CS-03, CS-05, GA-03, GA-12). The German contribution to the improvements in inter-agency cooperation, as well as in the updating process of the eCLUP guidelines, can be understood as a catalytic process, whereas GIZ's convening power supported the cooperation and vertical policy-uptake between previously isolated actors. One specific contribution that was crucial for the success of this process was that parts of GIZ staff were integrated into the work of the local partner HLURB, and thus directly worked together with HLURB staff.

The qualitative interviews show that the HLURB has been receptive for vital parts of the innovations and approaches previously tested by the Philippine–German Cooperation. The successful uptake and increasing interconnectedness of the German and the Philippine planning approaches is reflected in planners' perception of the German and Philippine planning approaches to be the same or at least hard to distinguish (MP-07I, PP-04, PP-05). This is partially a result of the strong focus on local ownership and the respectful approach about existing planning policy and administrative specifics in the Philippine administration. To some degree, the enhanced land-use planning approach that is being pursued nowadays can be considered, if not a "replica", at least a closely related approach. Only a few core concepts of the SIMPLE approach are not reflected in the eCLUP guidelines, such as the missing integration of barangay land use and development plans in the CLUP, which conflicted with the HLURB mandate, as well as much less focus on participatory development of CLUPs.

Hence, GIZ and the SIMPLE approach substantially contributed to the development and roll-out of the eCLUP guidelines at national level, in close cooperation with national partners, in particularly the HLURB. The eCLUP guidelines include substantial technical and institutional advancements, many of them influenced by the SIMPLE approach.

Returning to the evaluation question of Cross-sectional Topic 1, we can state that the intervention was able to contribute to a successful scaling-up of its land-use planning approach to national level, with strong Philippine stakeholder involvement. However, the evaluation also identified that there are financial and capacity constraints at national level. This leads to the issue that not all specified activities tested at sub-national level can be implemented accordingly at national level. The German contribution to enhanced land-use planning at sub-national level lies in strong contributions to the process framework for the development of CLUPs, as well as substantial technical support by means of trainings and capacity development, e.g. in the domain of GIS, as well as equipment. Furthermore, the intervention was able to contribute to improvements in inter-agency cooperation among local stakeholders and to achieve land-use planning of all ecosystems in municipalities.

In sum, the sustainability of effort is thus likely, but it remains unclear whether activities will be able to continue with the same intensity compared to that during the period of development assistance, given resource constraints among stakeholders in the Philippines. The extent of the interventions' contribution to long-term development achievements will thus be dependent upon the intensity of continuation of efforts.

4.9 Cross-sectional topic: consistency with development agendas and contribution to the SDGs

Land-use planning as a fundamental planning framework in Philippine municipalities and provinces has the potential to make a difference regarding several important areas of development. In order to evaluate the *relevance* of enhanced land-use planning, we address the question: "To what extent is enhanced land-use planning consistent with development agendas and in what ways does enhanced land-use planning contribute to the SDGs?" Specifically, we compare the objectives of the intervention with needs and strategies for development in the Philippines on the basis of the Philippine Development Plan 2017–2022, as well as its alignment with strategies of the German Federal Ministry for Economic Cooperation and Development (BMZ). Further, we examine the fit of the objectives of enhanced land-use planning with the SDGs as global development agenda and its actual contribution to the SDGs on the basis of our results to assess the *sustainability* of the intervention.

In the *Philippine Development Plan 2017–2022*, the Philippine government points out the following needs related to land-use planning. It describes disaster risk management measures as still inadequate and not introduced by all municipalities due to their lacking capacities, competencies, and information. It acknowledges that, despite the existence of sufficient regulation, environmental laws and plans are not properly enforced. The main strategies identified to reach environmental sustainability are the ridge-to-reef approach to ecosystem management and the integration into development planning on different levels. Participation is named as one factor in this process. The plan advises that forest management and protected areas are

important instruments, but also refers to the need to improve tenure arrangements. Regarding CLUPs, in line with this evaluation, it emphasizes the priority need to improve "partnership between land-related agencies and local governments in the formulation of CLUPs and zoning of residential areas" (NEDA, 2017: 324). Additionally, the plan recommends improved monitoring through cadastral survey data and information based on modern technology. The need for investments in the capacity and competence of planning staff is articulated, although resource shortages are not addressed. Investments in GIS, including hazard maps and improved measurement for DRM and climate change, are advised. In general, inclusion of DRM in development plans is aspired to. In line with the findings of this evaluation, the development plan advises revision of legislation regarding relocation, and sees a need to streamline the Land Administration Reform Act to improve tenure rights and to address long-standing land-use conflicts. In sum, there is a substantial common ground between the goals formulated in the Philippine Development Plan and the objectives of the enhanced land-use planning intervention, as well as remaining challenges identified in this evaluation.

In terms of the alignment of the intervention with the current *strategies of the BMZ*, the intervention is partly aligned with the ministerial strategic orientation; however, the broad and cross-sectoral scope of the intervention stretches across different operational areas. In the classification of the BMZ, the Philippines are classified as a "B-Country". Countries allocated to this category are subject to focused regional or thematic cooperation (BMZ, 2015a: 19). The thematic fields of development cooperation with the Philippines are centred on the topics of development cooperation in conflictive environment and post-conflict transition (BMZ, 2013), DRM (BMZ, 2015b) as well as protection of biodiversity (BMZ, 2014). While these topics are clearly related to the desired goals of the intervention, neither the inter-sectoral approach nor the strong governance component are clearly reflected in the current strategic orientation of the BMZ. This misalignment might be related to changes in strategic orientation during the longer project duration, and the BMZ's strategic focus in relations to legislative terms. However, the BMZ also commits to the SDGs of the global Agenda 2030, which the Federal Republic of Germany pledged to implement.

There are several overlapping goals between the impact fields defined by this evaluation and the SDGs as the current global development agenda. Enhanced land-use planning has the potential to contribute to the achievement of SDGs. In detail, land-use planning has a potential influence on the following goals: SDG 1 "no poverty", SDG 11 "Sustainable cities and communities", SDG 13 "Climate Action", SDG 13 "Life below water", SDG 14 "Life on land", and SDG 16 "Peace; Justice and strong institutions".

As described in Impact field 5 (section 4.6), enhanced land-use planning is expected to, in the long term, improve living conditions of the population and therefore to contribute to *SDG 1 "no poverty*". If interventions are well-targeted, enhanced land-use planning has the potential to strengthen economic growth and livelihoods and therefore reduce monetary poverty (target 1.1). It is thought to improve access to public services and regulate fairer access to land and resources (target 1.4), as well as to build resilience for the poor and vulnerable (target 1.5, Impact field 3). Finally, participation in land-use planning processes has the potential to give those vulnerable groups a stronger voice (target 1.B, Impact field 4). However, these potential contributions have been found not, or only partially, to materialize in the evaluated intervention. We were not able to identify robust effects on welfare and poverty (section 4.6), partially due to the long impact chain, but also due to missing implementation and communication. Participation processes are found not to be as strong as postulated (section 4.5.3). Disaster resilience increased, but only in certain municipalities (section 4.4.3). On the other hand, identification of communities vulnerable to hazards and their relocation to increase resilience brings trade-offs with regard to the possibility of sustaining their livelihood (section 4.4.3).

The main focus of enhanced land-use planning is closely linked with *SDG 11*. Both aim to increase *inclusiveness, resilience and sustainability of cities and communities*. In detail, SDG 11 names participatory, integrated and sustainable land-use planning and management directly as target (target 11.3 and 11.A) and points to the need for institutionalized DRM, whilst protecting the poor (target 11.5). Land-use planning in the SDGs is understood as a very broad concept, connected to development planning, interlinking sectors as well as rural and urban areas, and putting participation at the forefront. The concept is therefore similar to the enhanced land-use planning approach of the Philippine–German Cooperation. While the intervention

and the national scaling-up have strongly contributed to more and better land-use and development planning, a number of challenges regarding implementation, participation, and integration of plans remain.

As it is concerned with sustainable use of resources and disaster risk management, enhanced land-use planning also has the potential to contribute to *SDG 13 "Climate Action".* DRM is an important part of this goal (target 13.1), and enhanced land-use planning also aims to raise awareness of climate change (target 13.2). Results show that while awareness increases among municipal officers, interrupted information flows hinder the trickle-down of information on climate change to households (section 4.4.3).

For the Philippines, as an island state, *SDG 14 on conservation and sustainable use of marine resources* has special importance. For coastal communities, enhanced land-use planning has the potential to contribute to sustainable management and protection of coastal ecosystems (target 14.2), and to regulate harvesting and end over- and illegal fishing (target 14.4). Protected areas, as aspired to by enhanced land-use planning, are seen as an important measure to implement (14.5). While these goals were high on the agenda of enhanced land-use planning, we do not find robust effects in this regard (section 4.3.3).

By integrating all ecosystems, enhanced land-use planning has the potential to contribute to *SDG 15 on the protection and sustainable use of terrestrial ecosystems*, forests, and mountain ecosystems through protected areas (targets 15.1, 15.4). Through the inclusion of forest land-use plans (FLUPs) in CLUPs, enhanced land-use planning is supposed to contribute to sustainable forest management and reforestation (target 15.2). Integration of ecosystem values into development planning is a target of its own, where enhanced land-use planning does directly contribute (15.9). Also regarding the creation of protected areas, enhanced land-use planning contributes positively.

With its focus on improving local governance, enhanced land-use planning has the potential to contribute to *SDG 16* by *strengthening institutions*. It is thought to work towards effective, accountable, and transparent institutions at local levels (target 16.6) and to reduce corruption (target 16.5). Responsive, inclusive, participatory, and representative decision-making at all levels (target 16.7) is one of its core ideas. Despite this aspiration, results show that, while local municipalities are strengthened in their planning capacities, participation falls short of expectations due to limited resources and hindering factors, and accountability of local government officials is still not achieved (sections 4.2.3 and 4.5.3).

In sum, the comparison shows that the intervention has the potential to contribute to different targets of the SDGs. It therefore accounts for one of the basic idea of the Agenda 2030: the close interlinkages of goals. The SDGs also highlight interaction effects of development interventions. We show that positive effects of enhanced land-use planning are dependent on other interventions related to rural development. The same holds true in the reverse argument: that successful land-use planning is an important condition for positive effects in other interventions on rural development and thus may also indirectly contribute to the achievement of SDGs. Returning to the evaluation question on relevance, we conclude that enhanced land-use planning is generally suitable to contribute to the main global development agenda of the SDGs, to the extent that it is aligned with the Philippine Development Strategies and, to some extent, with German development priorities. Nevertheless, the main challenges in implementation remain, notwithstanding the need to address tenure security if better results in poverty reduction are pursued. This finding, supported by our results as well as identified by the Philippine Development Plan, strongly questions the *sustainability* of the intervention on the basis of achieved effects for the population. Land-use planning interventions can, if implemented thoroughly, and when addressing the institutional specifics of the host country, contribute to improvements not only in planning administrations, but to broader developmental goals.

5. CONCLUSIONS AND RECOMMENDATIONS

5.1 Conclusions

5.1.1 Overview

This evaluation assesses the *effectiveness* and *impact* as well as the *sustainability* and *relevance* of an enhanced land-use planning intervention in the Philippines. The core of the evaluation is the rigorous impact assessment of *effectiveness* and *impact*, using a quasi-experimental design on five impact fields: (1) Land-Use Planning and Techniques, (2) (Sustainable) Natural Resource Management, (3) Disaster Risk Management, (4) Local Governance, and (5) Welfare.

The scope of this evaluation has been to capture intended and unintended effects of the intervention along the reconstructed Theory of Change (ToC), using a rigorous impact assessment design. This systematic approach, the measurement of numerous indicators on all relevant administrative levels, makes this evaluation of land-use planning one of the most comprehensive studies in this field. We are therefore able to provide substantial new insights on what works and what does not in land-use planning and management. The land-use planning intervention by the Philippine–German Cooperation is typical of technical cooperation interventions that aim for local capacity development in local governance, particularly in the field of land-use planning. Thus, the results and conclusions are relevant to strategic decision-making in a number of policy fields.

We assess several aspects of the *sustainability* of the intervention, with a focus on the analysis of policy and innovation diffusion, scaling-up into national legislation, continuity of intervention benefits, and aspects relevant to the replication of the approach in other countries. Furthermore, we assess the *relevance* of the intervention in terms of its consistency with current development agendas and its contribution to the SDGs.

Presenting our conclusions, we follow the same systematic order of evaluation questions as outlined in section 3.2. The order is in line with the Output–Outcome–Impact pathways of the reconstructed ToC (see section 3.1), and follows the OECD–DAC evaluation criteria (see 1.3). First, we present our conclusions with regard to the *effectiveness* of the interventions, operationalized in the ToC in Impact field 1 on the levels of Output and Outcome 1. Secondly, we present our conclusions with regard to the *impact* of the intervention, operationalized in the four other impact fields of the ToC, on the levels of Outcome 2 and Impact. Third, we discuss the *sustainability* of enhanced land-use planning in the Philippines, and fourth the *relevance* of the SIMPLE intervention and ongoing eCLUP intervention. In all our conclusions, we critically appraise the limitations imposed by the context and the overall land-use planning framework in the Philippines. This leads us to extrapolate our conclusions and to develop lessons relevant to enhanced land-use planning interventions in other countries.

As a general conclusion, with regard to the criteria *effectiveness* and *impact* of the intervention, results show that the intervention has been successful in terms of having direct effects at those levels that are closer to the intervention along the ToC (Output and Outcome 1), and closer to municipal planning in terms of administrative levels. We often find fewer or no effects that are of a more indirect nature, on indicators of Outcome 2 or Impact, as well as on those levels further away from the administrative planning, in particular at household level. This is a finding that is cross-cutting through all impact fields. This finding contributes to recommendations V, X, and XI.

5.1.2 Effectiveness

In Impact field 1, we examine the *effectiveness* of the intervention, addressing the question: "To what extent and in what ways did the intervention improve *land-use planning practices and techniques*?" Indicators in this impact field are at Output and Outcome 1 levels of the intervention ToC and, thus, most indicators relate to official indicators of the NRG component as part of the EnRD programme. We find that the intervention is able to improve land-use planning, the CLUP, and related documents, processes, and capacities. We find higher plan quality, greater comprehensiveness, and a positive effect on plan approval. The intervention also leads to a more comprehensive planning of municipal territory, including public land and forest land. Training and capacitating lead to the anticipated improvements in enhanced land-use planning, as we

find that higher intensity of training is associated with better performance of the intervention. The processes and trainings seem to be appropriate for improving the CLUP and bringing it in line with the eCLUP guidelines. Enhanced land-use planning led to a more frequent implementation of mandatory planning elements. Weaknesses of the intervention are that we find little to no positive effects with regard to soft planning tools, such as participation and plan integration. This finding contributes to recommendations VI, VIII, and IX.

Additionally, the intervention could not contribute to better quantitative staffing in the municipal planning administration and it could not address the problem of job rotation and limited-term job assignments among LGU staff. The aspired aim of plan integration (between barangay and municipal level) has not been achieved. Furthermore, we see that current interventions concentrate on the development of plans, but it is equally important to ensure their effective implementation and enforcement. Qualitative evidence points to the importance of support by local executives and political bodies as a determinant of success in planning, implementation and enforcement. There is also evidence of a lack of support for, and politicized influence on, planning and implementation. These findings contribute to recommendations II, III, VII, IX, and XI.

On the effectiveness of enhanced land-use planning interventions, in particular, we find that significant positive effects are more likely if the intervention was in combination with other EnRD programme components, which seem to have been beneficial when delivering the outputs of the enhanced land-use planning intervention. This finding contributes to recommendation IV.

5.1.3 Impact

On the *impact* of the intervention, we follow the structure of the ToC, as outlined in section 3.1, and present the conclusions from Impact fields 2 to 5:

In Impact field 2, we analyse indicators on sustainable natural resource management, addressing the question: "To what extent and in what ways did enhanced land-use planning lead to an *actual change of land use and (sustainable) natural resource management*?" Indicators in this impact field are at Outcome 2 and Impact level of the intervention ToC and stem from the implementation logic of the NRG component or refer to official indicators of other EnRD components. In this impact field, we observed weaker effects than those on land-use planning. However, the effects follow the same pattern in that we find stronger effects at the municipal level, and weaker effects at the barangay and household levels. Enhanced land-use planning was able to increase the number of protected areas (but not marine sanctuaries), and of conservation projects such as tree planting. At barangay and household level, however, we cannot confirm these results. There is also no measurable influence on actual land-use change as reported by households. In combination with low awareness of households regarding environmental protection, this hints at a missing implementation and enforcement of plans, as well as a lack of information and awareness of the population. These are prerequisites for acceptance of, and respect for, environmental regulations and, thus, a need for actual change towards sustainability. These findings contribute to recommendations V, X, and XI. As with Impact field 1, we find in the field of natural resource governance that the combination of land-use planning interventions and other EnRD programme components is more likely to lead to significant effects. This finding contributes to recommendation IV.

In Impact field 3, we observe the effects of the intervention on DRM, addressing the question: "To what extent and in what ways did enhanced land-use planning improve *disaster risk management*?" Indicators in this impact field are on the Outcome 2 and Impact level of the intervention ToC, and mostly refer to official indicators of the DRM component and those of the EnRD programme, or stem from the implementation logic of the NRG component. As in the previous impact field, in general, the results also show stronger effects at municipal than at household level. Enhanced land-use planning was at least partly able to strengthen the disaster risk-management strategies of municipalities. At barangay and household level, positive effects are restricted to those municipalities in region 8 and those that received the intervention after 2012. This might be due to a stronger focus of the intervention on DRM after typhoon Yolanda, but also to the increased implementation of more recent Philippine legislation on DRM. However, results show clearly that one of the reasons for missing effects at household and barangay level in the remaining areas is the

interrupted transmission of information from the municipality to the households. These findings contribute to recommendations X and XI.

In Impact field 4, we analyse effects of enhanced land-use planning on local governance, addressing the question: "To what extent and in what ways did enhanced land-use planning improve *local governance*?" Indicators in this field are at the Outcome 2 and Impact level of the intervention ToC, and many of them refer to official NRG component indicators, stem from the NRG implementation logic, or refer to official indicators of the EnRD programme. Results in the field of *local governance* also show relatively weak effects on participation and inclusion. Potential benefits from participation, such as the inclusion of local information and discussions concerning the needs and priorities of people, do not seem to materialize due to limited efforts to encourage participation in the development of CLUPs. The SIMPLE intervention seemed to have gradually shifted over time from bottom-up participation at household and barangay level to a greater or sole focus at municipal level. In addition, in the ongoing eCLUP intervention, limited planning staff and capacities among municipal planning administrations make a comprehensive participation process very difficult, without external support or extended support from local executives. Qualitative evidence points to substantial problems in the implementation of participation at municipal and barangay level, ranging from criticism that participation is not properly pursued and that participation is purposively restricted. These findings on inclusion and participation contribute to recommendations V, IX and X.

In terms of the functioning and responsiveness of local government, we find negative effects on the perceived ability of the municipality to attract external funds. At the household level, we find negative effects on people's perception of LGU officials' performance and responsiveness, on their trust in local government officials, and to an extent on the quality of barangay processes. Qualitative evidence suggests that the intervention was not able to address counterproductive power structures in municipalities, nor self-serving or vested interests, e.g. of local officials and large land owners. These local power structures might counteract the finalization of political sections of a CLUP and zoning ordinance, and thus might hamper implementation and enforcement. The likely result is a "CLUP for the shelf" – meaning plans that are never or only partly implemented. These findings on performance and responsiveness of local governments contribute to recommendations I, II, III, V, VII, X, and XI.

In terms of the perception of improvements in public services (infrastructure and social services) at household and barangay level, we find predominantly positive effects. Contrary to that, we find consistent effects of an increased number of boundary and other conflicts. Qualitative evidence shows that hidden conflicts came to the surface in the process of land-use planning. We also find, by tendency, effects on more active conflict handling by municipalities and barangays. These findings on public-service provision and conflicts contribute to recommendations I and XI.

In Impact field 5, we present indicators concerning welfare effects, addressing the question: "To what extent and in what ways did enhanced land-use planning lead to improved *welfare*?" Indicators in this Impact field are at Outcome 2 level of the intervention ToC and – predominantly – at Impact level; most indicators in this field result from the reconstruction of the ToC, while few indicators relate to official EnRD indicators. The expected effects on *welfare* are long-term, indirect, and at the end of the causal chain. This might – at least partly – explain that, in general, we do not find consistent and attributable effects on any of the welfare measures. Positive results in region 6 are rather overlaid with effects of rapid urbanization and development in this region. Additionally, interruptions in the causal chain, as well as in the participation of and information provided to the population are further factors that hinder the materialization of welfare effects. Missing effects in the indicator at household level on whether land tenure is threatened by third parties are consistent with qualitative findings that the issue of land-use rights and tenure security remains mostly unaffected by the land-use planning intervention, an omission that makes systematic and continuous improvements in tenure security and land-use rights impossible. On the contrary, qualitative evidence shows that unintended negative consequences for rural households might result from the definition of hazard zones as part of the land-use planning process. Relocation – despite its necessity for increasing disaster preparedness – can bring severe threats to livelihoods, in particular to poor households. The processes for

defining relocation needs and sites, and the way they are carried out, need to be overhauled. These findings contribute to recommendations I, VI, X, and XI.

We can draw some general conclusions from the analysis of the impact fields:

First, we observe – with an exception[22] – that those municipalities that have received a *larger number of trainings* also systematically show more frequently statistically significant and stronger effects in the hypothesized direction. Also, this finding is cross-cutting through all impact fields. This leads to our conclusion that trainings in enhanced land-use planning is indeed a beneficial determinant for increased effects. It shows that a certain level of investment per municipality is required, and that scaling-up of enhanced land-use planning to further regions or even the national level has to take into account the equally increasing need for trainings to sustain the positive effects of the interventions. This points to an important issue in development cooperation: while support for drafting legislation/regulations is important, these types of interventions need to be complemented by efforts to build local capacity through investments in staff training. These findings are highly relevant to future development programme planning, and contribute to recommendation IX.

Second, in contrast to the aforementioned general conclusion, the sub-group analysis of those municipalities where the intervention started before 2012 show a somewhat inconsistent pattern. Since these municipalities had both intervention of a longer duration and the provision of more comprehensive intervention activities we hypothesized stronger effects. Those municipalities where intervention started only after 2012 received a heavily reduced scope of the intervention. We can confirm this hypothesis consistently for the indicators in Impact field 1 on land-use planning. In addition, Impact field 2 on natural resource management predominantly confirms the hypothesis, too. On the other hand, this sub-group analysis does not make a substantial difference in Impact field 3 on DRM. In Impact field 4 on local governance, the pattern with regard to those municipalities where intervention started before 2012 is less clear. While it tends to improve the effects in the field of performance and responsiveness of local government, some indicators in the field of participation and inclusion increase effects (e.g. participation of barangay captains in enhanced land-use planning), while others turn in the opposite direction of our hypothesis (e.g. bottom-up-budgeting). In the field of conflicts and conflict management, longer-standing intervention tends slightly to increase the number of open conflicts, but also to improve conflict handling. Indicators in the field of public-service delivery do not show a clear pattern, but there are also no substantial differences. Impact field 5 on welfare at household level more often shows significant positive effects than in the analysis of the full sample. From this subgroup analysis, we conclude that a longer duration and larger scope of the intervention, by tendency, leads to increased effects on indicators related to land-use planning and natural-resource management. In contrast, they do not have a consistent effect on indicators regarding participation and inclusion.

In other words, we see that long-term support more likely leads to desired effects and therefore should be favoured, but we also see that the fields where measurable effects arise can be selective and thus require adjustments during project implementation. In combination with the aforementioned general conclusion on the relevance of trainings, we conclude that the combination of trainings and long-term support requires an iterative adjustment of the scope of the intervention – e.g. based on accompanying research – in order to be most effective. Hence, it is a management decision to either invest more in those fields where little to no effect can be seen or to reduce the scope of the intervention with regard to these fields, in order to strengthen the effects in more promising fields of the intervention. This finding contributes to recommendations II, III, and XII.

Another factor leading to stronger effects – at least regarding results at municipal level – is the *embeddedness of land-use planning activities with further supporting interventions, i.e. other EnRD programme components* in the case of this evaluation. Other components of the EnRD programme were beneficial for

[22] *One exception in this subgroup analysis is that participation of households in planning activities and quality of barangay processes (both self-perception at household level) becomes significant in a negative direction.*

the success of the land-use planning approach SIMPLE, evidently in Impact field 1 and 2, but less consistent in the other impact fields. Qualitative results indicated that CBFM, DRM and Integrated Coastal Management (ICM) were, in particular, the components contributing to SIMPLE goals, but so was the component on food security, EFOS. The sectoral approach to enhanced land-use planning in the Philippines profits from the corroborating efforts of other developmental interventions. This finding is in line with Agenda 2030 and the SDGs that highlight interaction effects, unintended consequences, and calls for better integration of interventions. It is also of substantial importance to note that the reverse argument is also true: the existence of an appropriate CLUP and zoning ordinance is an important condition and factor for successful other rural development measures, such as forest management, disaster risk management, agricultural productivity, and value chains. This finding contributes to recommendations II and IV.

As a fourth factor, we identify *weak enforcement and implementation of plans* as a reason why we rarely find indirect long-term effects of effects at household level. As we laid out in section 3.1, the transmission mechanism between land-use planning and the other impact fields is the effective enforcement of plans, the implementation of planning goals, a functioning zoning ordinance, and continuously updated plans. From the relationship of impact fields, going down the Output–Outcome–Impact pathways, and from the qualitative evidence, we conclude that unobserved land-use change as well as monitoring of actual land use remains an unresolved issue for municipal and provincial planners. This includes many other aspects of continuous plan adjustments. The development and approval of the CLUP is the first step, but does not necessarily materialize in actual change of land use. Actual change in land use, triggered by CLUPs, is dependent on successful implementation and enforcement of land-use plans. Land-use planning requires a consistent monitoring system to ensure the sustainability of efforts. As in all international development cooperation interventions, this shows that drafting, or even enacting, a legal or regulatory framework alone is insufficient to lead to desired effects. It needs to be complemented by interventions aimed at strengthening the implementation and enforcement capacity of institutions. This finding contributes to recommendations II, III, VII, and XI.

A fifth factor, which is a common pattern in all impact fields and confirmed by qualitative results, is the insufficient integration of the population in the planning process. The comprehensive understanding of land-use planning in the Philippines includes many aspects close to people's lives, such as the (first-time) specification and drawing of hazard maps, the definition of hazard zones, the definition of DRM strategies and evacuation plans, boundary demarcation, gender mainstreaming, and more detailed regulations for economic activities on public land. Such planning decisions cannot be properly taken without consultation and participation of the people in order to make the CLUP consistent with the reality in the municipalities. Not only in Impact field 4 on local governance, but consistently in all impact fields, we identify a still inadequate level of information, and of consultation and participation of communities and households in the planning process. While participation had a high priority in the first pilot projects of SIMPLE, it decreased in importance later in the implementation process.

In the eCLUP guidelines, information dissemination and active participation are not integrated to a sufficient degree and appear to have received a lower priority, partly due to a missing administrative mandate and partly due to missing human and financial resources. Although some public hearings are mandated, the population is not necessarily taking part in them. Reasons for this are the way they were prepared, and who and how people were invited. The quality of consultations – more dissemination than actual consultation – also seems not always to meet the needs of the population, leaving them uninterested. Other forms of communication and participation are insufficiently applied. Municipalities have the educational duty to sensitize and inform people about the relevance of planning topics to their daily life. This finding is mirrored by an absence of integration of Barangay Development Plans (BDPs), making local prioritization of development plans less likely. Information flows between population and administration remain insufficient, not only from the bottom-up, but also from the top-down. The results of the evaluation show that the intended effects and awareness-building generally do not reach to the household level. Missing visible effects at barangay and household level indicate that the transmission of the intervention from the planning level to the household level does not sufficiently work. These findings contribute to recommendations V, X, and XI.

As a sixth factor, we identify insufficient resources. Results show that land-use planning activities, drafting, and implementation indeed suffer from insufficient resources at local level. This is particularly the case after the nationwide roll-out of eCLUP and finalization of SIMPLE. While the enhanced CLUP guidelines are a meaningful successor to the old CLUP guidelines, taking into account a variety of important topics, the development of the *CLUP is highly complex and challenging*, given the current staff capacities of municipalities. This finding contributes to recommendations IV, VIII, and IX.

5.1.4 Sustainability

With regard to the *sustainability of the intervention*, we assessed several aspects with regard to the continuity of intervention benefits by addressing the question: "What are relevant findings with regard to the sustainability of the intervention and the continuity of intervention benefits, particularly with regard to *innovation diffusion, scaling-up and replication* of land-use planning processes?"

As an important pillar of *sustainability*, SIMPLE contributed to the successful development of the *eCLUP guidelines as a national instrument*. The development of the eCLUP guidelines is based on an intensive cooperation between GIZ and HLURB. Training material and planning processes developed by the Philippine–German Cooperation within the SIMPLE approach were consistently taken up by governmental agencies, merged with progressing national documentation, and aligned with national objectives. Most of the technical and institutional advancements of the eCLUP guidelines are influenced by the SIMPLE approach. Two main exceptions in this scaling-up process are the integration of barangay plans and barangay-level prioritization (mostly due to a missing mandate in the current national land-use framework) and less emphasis on public participation in the planning process within the eCLUP framework. These findings contribute to recommendations IV and X.

With regard to the continuation of benefits of SIMPLE after its official end, there are four main observations. First, since our data collection finished several months after the end of the intervention, we were able to observe effects in this period. Second, the process of CLUP development was not yet finalized (i.e. plan approval) in most intervention municipalities, and we see signs that its development is likely to continue in the future. Third, positive effects on the existence of trained staff, GIS experts and use of technology are likely to continue in the near future despite difficulties due to brain-drain and a lack of resources at municipal level. Fourth, implementation according to the eCLUP guidelines without support by the Philippine–German Cooperation will likely lead to fewer trainings, capacitating, and participation due to reduced resources, which diminishes long-term effects. These findings on the continuation of benefits contribute to recommendations IV and IX.

The analysis of innovation and policy diffusion reveals important aspects with regard to the sustainability of the programme (see section 4.7). Diffusion was not restricted to GIZ training material, but diffusion mechanisms also influenced the quality of CLUPs in control municipalities by improving processes of CLUP development. The SIMPLE intervention supported diffusion processes by assisting control municipalities in land-use planning and CLUP development through trainer pools at the provincial level. Although it is rather unlikely that trainer pools continue to exist after the end of the intervention, they were important in spreading the intervention and thereby contributed to the sustainability of the intervention. The fact that we found evidence of diffusion is likewise an indicator of the intervention's high degree of innovation. We can thus conclude that development interventions are able to actively promote diffusion, which in turn contributes to sustainable benefits. These findings contribute to recommendations IV and IX.

5.1.5 Relevance

In terms of the relevance of the enhanced land-use planning intervention, we address the question: "To what extent is enhanced land-use planning consistent with development agendas and in what ways does enhanced land-use planning contribute to the SDGs?" We therefore assessed whether the intervention is consistent with current development agendas, namely the German development agenda, the Philippine Development strategy, and the current global development agenda in the form of the SDGs and Agenda 2030.

As previously mentioned, the SIMPLE intervention by the Philippine–German Cooperation has gone through a scaling-up process and is now adapted and reflected in the national eCLUP guidelines by the HLURB, leading to further consistency with Philippine development objectives. Furthermore, we identify substantial common ground between the goals of enhanced land-use planning, both SIMPLE and eCLUP, and the Philippine Development Plan 2017–2022. With regard to the German development agenda, we see predominantly common ground in objectives, mostly on rural development and community resilience, as well as in its commitment for the Agenda 2030.

Having compared the goals of enhanced land-use planning in the Philippines with the Sustainable Development Goals, we identify the potential of enhanced land-use planning contributing to different targets. However, we also conclude that major challenges in implementation remain, and many results of the rigorous impact assessment in this evaluation point in that direction. Addressing these shortcomings in land-use planning will also contribute towards achieving the SDGs. While proper land-use planning is an important component of fair land and resource access, we need to highlight that the SDGs cannot be achieved without sustainably solving conflicts regarding land-use rights. The, as yet unfinished, implementation of the Agrarian Reform in the Philippines leads to continuing hardship for rural smallholder and landless households. Pragmatic solutions to marginally improving *tenure security* in the short-term, such as tax payments on used land leading to some formalization of land-use, are important, but can only be second-best solutions. Improving the processes to grant land titles and to ensure tenure security, and a working and fair land administration system should be top of the Philippines land-use agenda. These findings contribute to recommendation I, II, and VI.

5.2 Recommendations

We derive the following recommendations systematically from the conclusions of the report (section 5.1) and thus exclusively draw on the quantitative impact assessment, the interpretations and causal mechanisms derived from the qualitative data analysis, and the analysis done on the cross-sectional topics. Generally, we would like to emphasize the learning function of impact evaluation and its recommendations: the relevance of its findings and conclusions for programme development and improvements to ongoing interventions. Therefore, we direct the recommendations of this report at different types of actors, agencies and ministries, which we group into five types of addressees:

Table 21: Type of addressees of recommendations

Addressees	Description
PA	Political Actors and Departments responsible for strategic decision-making for future development interventions in low- and middle-income countries; on land-use planning, local governance and rural development. Main PA addressee is the German Federal Ministry BMZ.
IA	Implementing Agencies responsible for planning and implementation of development interventions on land-use planning and those replicating land-use planning interventions in other countries. Main IA addressee is GIZ headquarters in Germany.
PNA	Philippine National Agencies or ministries responsible for implementing and continuously improving land-use and development planning in the Philippines. Main PNA addressees are HLURB and DILG, as well as other sectoral agencies such as DENR, NEDA, DA, and DAR.
PGC	Philippine–German Cooperation. Main PGC addressee is GIZ Philippines.
PPA	Philippine Political Actors who are responsible for providing the national framework for land-use planning and development planning in the Philippines. Main PPA addressees are the legislative bodies of the national Philippine government.

5.2.1 Recommendations for designing new land-use planning interventions and for improving ongoing land-use planning interventions

I. Land-use rights and land-use conflicts need to be taken into account within land-use planning interventions. Thus, interventions need to systematically address the underlying mechanisms of land-use rights and tenure security so as not to lose implementing power. (→ Addressees PA + IA + PNA + PGC)

a) Land-use planning interventions need to seek an active role in the pursuit of formal solutions to problems associated with unresolved land-use rights and tenure security. Where no formal solution can be reached, the gradual formalization of land use (without titles) should be systematically supported. This formalization process should take into account the interests of disadvantaged groups.

b) Land-use planning interventions whose success is dependent on local power structures need to consider actively promoting the voice of marginalized groups by strengthening local organizations (civil-society empowerment) in order to allow informed and local participation of people and communities in land-use planning processes.

c) Since land-use planning increases the number of (openly discussed) conflicts, local administrations need to be strongly supported in conflict handling. Measures such as arbitration and mediation for small-scale conflicts should remain or become part of the standard training scheme, and need to be backed up with human and financial resources.

II. To ensure the impacts and sustainability of the intervention, future interventions need to take measures that ensure proper plan implementation and enforcement of plans. (→Addressees PA + IA + PNA + PGC)

a) Land-use planning interventions should integrate measures to ensure implementation and enforcement mechanisms at the required administrative level. Local government administrations need to be supported in the development of strategies to ensure plan implementation and enforcement. Agencies implementing LUP interventions should engage in streamlining planning processes to allow local governments to start implementation more quickly (see recommendation VIII). Low-maintenance monitoring tools need to be established to support local partners to track implementation and planning outcomes.

b) Results show that enhanced land-use planning potentially contributes to the SDGs and sustainable development. However, contributions can be further focused on achieving the SDGs. Political decision-makers should prioritize support to local planners in those fields where land-use planning is most promising to show positive effects for certain SDGs to increase alignment of local land-use planning with goals of sustainability.

5.2.2 Recommendations for designing new land-use planning interventions

III. Consider framework conditions thoroughly, such as local political conditions and power structures in the implementation of land-use planning and local governance interventions, and align implementation targets with realistic opportunities. (→Addressees PA + IA)

a) Since local political and power structures can thwart implementation and enforcement of land-use plans and zoning ordinances, we recommend systematically assessing and critically appraising local power structures prior to the implementation of LUP interventions. These structures need to be systematically integrated into the planning process in order to ensure implementation and enforcement. Local expertise should be used to gain a realistic picture of achievable implementation goals.

IV. An integral part of future intervention designs should be the integration of options for upscaling of development interventions, support structures for innovation diffusion, and coordination with related development interventions. (→ Addressees PA + IA)

a) In order to ensure the sustainability of project implementation and to maintain the relevance of the project to the host country, we advise close cooperation with the country's agencies in pursuit of embeddedness in the processes of the host country. Options for national scaling-up of locally tested development interventions should be considered right from the beginning, and substantial efforts and personnel should be allocated for this task. The LUP intervention of the Philippine–German Cooperation is a good example of successful cooperation with national agencies, and of an embedded design, with GIZ staff working directly within the Philippine agencies providing support. At the same time, implementers should consider that successfully scaled-up processes need also to function with, on average, fewer resources and limitations on staff and capacity.

b) Policy and innovation diffusion should be systematically integrated into the implementation design. Trainer pools at higher (e.g. provincial) level, as in the SIMPLE approach, are a promising model. Horizontal diffusion processes should also be actively supported, by means of inter-municipal planning workshops and learning sites to function as best-practice examples and to promote peer-to-peer learning.

c) Effects of indicators in land-use planning and sustainable natural resource management gain especially from implementation alongside other related development interventions. In the case of enhanced land-use planning, those interventions on forest protection and management, disaster risk management, coastal resource management and protection, and food security were especially beneficial. New interventions should consider the implementation of related development interventions alongside LUP.

V. In new land-use planning interventions, public participation and information should be an integral part of the intervention design, and substantiated with sufficient resources, a consistent implementation of participation, and communication of realistic goals. (→ Addressees PA + IA + PGC)

a) In land-use planning interventions, we recommend further investing in participatory development. Many positive effects of land-use planning interventions heavily depend on proper dissemination, active community participation, and local knowledge. Interventions should plan and implement sufficient resources and measures to achieve sufficient knowledge about land-use planning processes and interventions at the household and lowest administrative level, to ensure that people's needs are reflected in the planning process.

b) Realistic goals and expectations need to be communicated (including through text messages and social media) transparently to avoid negative public awareness and false expectations among the participating population.

c) If participation is part of project implementation, implementers should implement it consistently; financial constraints of participative interventions should be taken into account at the beginning to allow participation at a consistent level during implementation.

5.2.3 Recommendations specifically addressing land-use planning interventions in the Philippines

VI. National framework conditions need to be improved, as they are the prerequisite for successful land-use planning. Particular issues are caused by conflicting mandates, and by unresolved issues of land-use rights and tenure security. (→ Addressees PNA + PPA)

a) Agencies with a mandate relevant to land titling and land rights should cooperate with agencies mandated with land-use planning who are currently only concerned with the acknowledgement

of land tenure. A national framework should lay out the legal obligation and modes of cooperation with the aim of improving tenure security, to align land-use planning with land-use rights, and to align interests of agencies.

b) Conflicting mandates between land-use planning and sectoral agencies need to be addressed and solved in order to allow consistent planning at LGU and provincial level. This is also necessary in order to achieve a systematic implementation of participation and information exchange processes. A national framework should reform the structure of agencies' mandates to improve consistency in land-use and development planning.

VII. Framework conditions, such as local political and power structures, should be also considered at the local level as they may thwart effects of land-use planning interventions. Measures for public accountability should be taken. (→ Addressees PNA + PGC)

a) We identified shortcomings in planning (e.g. political parts of the CLUP or zoning ordinance), but particularly in plan implementation, approval, and enforcement at the local level. Thus, we recommend that local executive officers and legislative officials need to be systematically included in the planning process in order to bind them to goals that serve the common good, to ensure administrative support for land-use planning according to the CLUP, and to better link the CLUP and its implementation with the local agenda.

b) Public accountability at local level needs to be strengthened. We recommend that HLURB, in cooperation with DILG, introduces legally enforceable measures and sanctions if administrative implementation contradicts plans or relevant LUP documents. We recommend, for example, the public reporting of such transgressions, to establish a complaints mechanism and to appoint ombudsmen.

VIII. Local CLUP development processes should be adjusted in order to ensure timely and effective plan development at LGU level. Coordination between LGUs and between agencies at provincial level should be improved. (→ Addressees PNA)

a) The eCLUP guidelines are innovative, but complex, and the implementation is challenging and time consuming. It needs mechanisms to approve more rapidly (parts of) the CLUP. In order to ensure timely and effective plan development, we recommend an assessment – before plan development or updating – of the specific characteristics and priorities of LGUs in order to make proper CLUP development possible following eCLUP guidelines. Accordingly, we recommend defining two stages of completion of the CLUP for each specific LGU, based on local characteristics and priorities. These two steps allows for the completion of the locally most important parts of the CLUP in a focused and timely manner, before the LGU continues with the second step towards a complete CLUP.

b) HLURB, NEDA and DILG should strengthen planning coordination between LGUs. This is also a requirement for the implementation of the ridge-to-reef approach within a municipality, and the watershed approach requiring coordination between municipalities. For the latter, we recommend setting the level of coordination mostly at the provincial level.

c) Technical tools to monitor land-use change at the parcel level, using GIS techniques, could simplify the process of monitoring land-use change.

IX. The system of trainings, capacity- and human resources development should be overhauled in order to improve local planning capacities and to avoid brain drain. In order to achieve a successful implementation of the eCLUP guidelines, more and better-coordinated trainings are necessary. (→ Addressees PNA + PPA)

a) Training and capacitating local and provincial planners and GIS experts was successful in the SIMPLE approach and should continue. The Philippine government needs to develop a consistent judicial training and capacitating system for local and provincial planners, and to improve

the number of skilled staff in LGU and provincial planning administrations. HLURB's regional capacities for the training of provincial and municipal staff has to be increased. It is desirable that this training system is developed and carried out jointly, in a cooperation between HLURB and DILG. Also, training resources at state universities should be better integrated into the training system.

b) Trainings for LGUs and provincial planning administrations should be affordable, if not without costs. Conditions and prices should be made transparent, and unnecessary travel and associated costs should be kept to a minimum.

c) Keeping GIS knowledge at municipal level is essential for the development of the CLUP. A brain-drain of GIS experts from these levels should be avoided. We recommend two options to reduce the difficulties arising from brain-drain of GIS personnel:

   i) We recommend GIS knowledge centres at a provincial level. They could ensure further continuous trainings at the municipal LGU level, could increase motivation among LGU staff, and could partially compensate for the negative effects for the municipal planning administration, if GIS experts leave their jobs.

   ii) In order to avoid unsystematic brain-drain (i.e. skilled staff leaving for other jobs outside public administration) at the local level, experts should be given a professional career perspective in planning administrations at municipal, provincial, and regional level. Due to the complexity associated with planning tasks, long-term positions are preferable to short-term job-assignments, also at local level.

d) Countrywide trainings and support might be less efficient than a well-thought-through phasing in of trainings and capacitating. This could be done, for example, by publicly or randomly selecting one or a few LGUs per province in order to receive land-use planning trainings and capacitating. The other LGUs would follow later. We recommend that HLURB develops a feasible training and support plan, in cooperation with DILG. We expect that experience, processes, and innovations can diffuse from initially capacitated municipalities (learning sites) to neighbouring municipalities; HLURB and DILG should actively support this diffusion process, e.g. by giving best-practice municipality examples and institutionalizing networks for exchange.

e) If the Philippine government vis-à-vis HLURB and DILG is not able to increase trainings for local planning staff, a general focusing and prioritization of elements in the comprehensive eCLUP guidelines might be necessary to ensure the nationwide implementation of eCLUP.

X. Public participation and information should be strengthened, and efforts should be increased to ensure the consideration of local needs and priorities in the implementation of land-use plans. (→ Addressees PNA)

a) Participatory planning and the inclusion of people in certain steps of the planning process ensure that plans fit reality and people's needs. Beyond information dissemination, active community participation is desirable. Participation is deemed to be particularly useful in the following fields: Assessment of current land use and tenure status; Definition of hazard and protection zones; Laying out of DRM measures and relocation plans; Prioritizing and acknowledging barangay aspirations; Controlling and advising plan implementation and enforcement. Participation processes require a clearly focused and standardized format to be cost-effective. Participation should be made mandatory for LGUs, and sufficient resources should be allocated. In the eCLUP guidelines, the relevance of participation should be strengthened and should describe measures to ensure that participation is actually implemented. As with trainings, collaboration between DILG and HLURB on participatory planning is strongly encouraged in order to coordinate participation processes in communities, and also to remain within the mandate of HLURB.

b) The current level of information and dissemination on LUP in communities is not sufficient and therefore should be improved. We recommend that HLURB and DILG develop and implement a

strategy to improve dissemination of relevant LUP-related information, for example on environmental protection and livelihood programmes. Public hearings are an important mechanism, but other additional information and participation formats are necessary.

c) All dissemination and participation formats should take measures to encourage participation of disadvantaged groups, such as the landless and people with insecure land-use rights. The LGUs should be advised to design meetings to be unintimidating to people, to make invitations inclusive, not selective, and information before and during the event sufficient and relevant.

d) Barangay-level dissemination should be made mandatory: excerpts of relevant parts of the CLUP, maps, and the zoning ordinance should be made available to barangays, in local language and open to the public in order to support informed public opinion.

XI. Implementation and enforcement of plans should be given a higher priority in order to avoid CLUPs "for the shelf". (→ Addressees PNA + PGC)

a) The HLURB should actively support the actual implementation of CLUPs and continuous plan adjustments. HLURB, in cooperation with DILG, should implement a system of incentives and disincentives for LGUs. HLURB and DILG should improve the processes between the CLUP and project planning and budgeting at municipal level.

b) Implementation of CCA, disaster risk assessment, and DRM strategies, requires stronger participation and inclusion of individuals and households (e.g. definition of hazard zones and relocation areas). This involves three types of actions:

   i) Information dissemination on municipal and barangay DRM needs be carried out more effectively. The DRM efforts between municipality and barangay need to be more strongly coordinated to ensure coordinated disaster response.

   ii) Relocation as part of DRM planning needs to be implemented according to the law and with respect to human rights (e.g. right to appeal and fair trial, adequate compensation, timely information for households and transparency). Implementation of relocation must not lead to disadvantages to the affected households.

   iii) The process of defining hazard zones and relocation areas needs to involve the public on whether relocation is the appropriate response to a hazard, and whether livelihoods can be met in the relocation site.

c) In cooperation with the Biodiversity Management Bureau, the definition and extension of protected areas in the CLUP needs to include the public, and should encompass discussions and planning of required behavioural change by affected people to enable them to sustain their livelihoods.

d) Conflict handling and mediation capacities of provinces with regard to boundary conflicts between neighbouring municipalities need to be substantially upgraded. Interfaces with national authorities concerned with boundary conflicts should be improved.

5.2.4 Recommendations for Monitoring and Evaluation (M&E)

XII. In order to improve future land-use planning and local governance interventions, and to allow learning from complex interventions of technical cooperation, policy-makers and implementers need to consider the prerequisites for reliable and rigorous evaluations at the *beginning* of the process of developing interventions. (→ Addressees IA + PNA + PGC)

a) Just as with any effort to measure results, impact evaluations require reliable baseline information, collected before or at the beginning of the intervention. Implementation roll-out should be coordinated with M&E data collection. Rigorous impact assessment requires a certain size threshold of the intervention. Medium (or large-scale) interventions with clear focus are likely to obtain larger, measurable, effects.

b) In order to guarantee reliable evidence, implementers should define the intervention (area and beneficiaries) clearly and precisely. Changes in the intervention or mode of intervention need to be carefully documented. We advise that implementers consult the evaluation team before selecting the intervention area or beneficiaries. There might be modes of selecting intervention sites which is beneficial for both: for evaluations and project implementation.

c) Strengthening evaluation capacities of local staff of implementing organizations as well as in partner organizations allows for a better understanding of the requirements for rigorous evaluations and for ensuring continuous and sustained local accompanying research.

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7. ANNEXES

7.1 Annex: Details on methodology

7.1.1 Characteristics of the propensity score matching

In the absence of random assignment, propensity score matching (PSM) uses characteristics, measured before the intervention, that influence the intervention and are correlated to the outcome, in order to balance control and intervention group. As finding controls that match the intervention observations regarding a whole range of characteristics is difficult, matching can be done based on a propensity score (PS), i.e. the probability that a unit is in the intervention group (Rosenbaum and Rubin, 1983). This probability is estimated using a logit or probit function. The sample is restricted to ensure an area of common support: controls which do have very different propensity scores than any intervention observations are dropped and vice versa.

To construct a control group that does not differ systematically from the intervention, different matching algorithms can be applied. Using kernel matching, controls are weighted based on their propensity score to create a sample that is balanced on pre-intervention covariates (Caliendo and Kopeinig, 2005). If panel data are available, one important covariate is the outcome variable before the intervention (Lechner, 2011). The effect of the intervention (average treatment effect on the treated or ATT) is then calculated as difference of means between both groups in the outcome variable.[23] The approach is described in Figure 12.

This quasi-experimental approach allows an identification of the treatment effect under non-random assignment of the intervention. However, it also has a major disadvantage in comparison to experiments, as it exclusively draws on observable characteristics and assumes that neither group differs from the other in unobservable characteristics (Shadish et al., 2002).

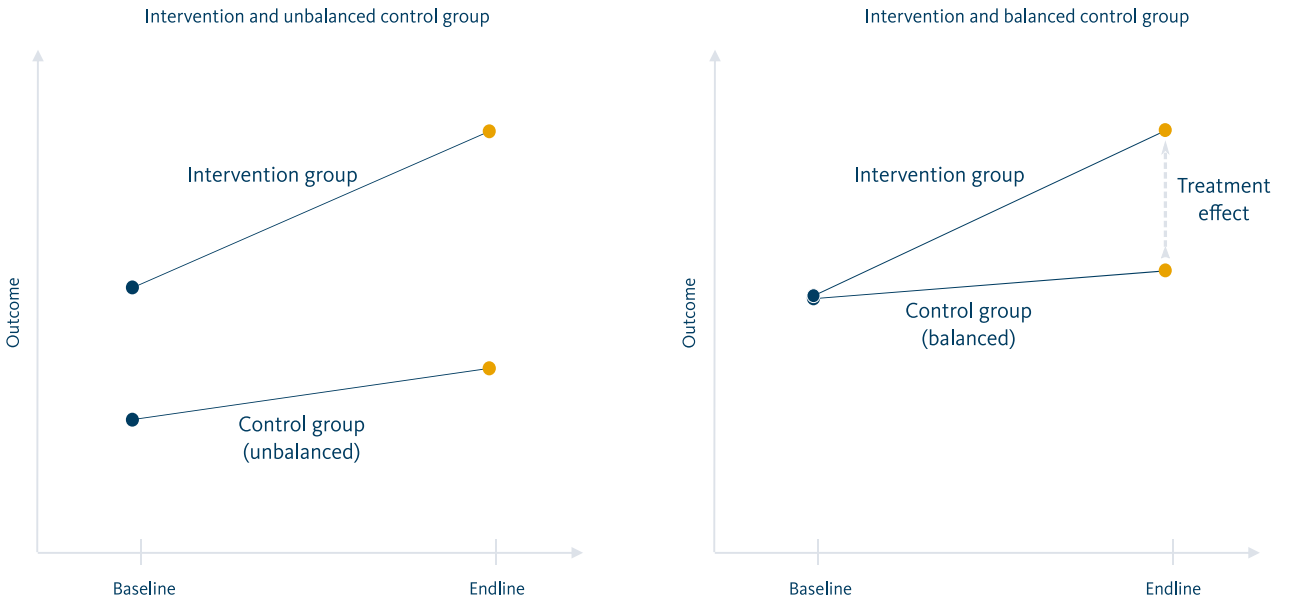
The propensity score is estimated as a probit regression on a sample of both intervention and control group, with participation in the intervention in 2016 being the dependent variable. The propensity score matching approach requires the outcome of interest to be independent of intervention after conditioning on the covariates (Rosenbaum and Rubin, 1983). To ensure that this assumption holds, only covariates from 2012 are used to estimate the propensity score. Further, covariates are chosen that influence participation and outcome (Caliendo and Kopeinig, 2005).

For this evaluation, impact models were calculated at three different levels: municipal, barangay, and household. To estimate the propensity score, variables from all levels were used. All models used municipal-level variables; barangay models additionally used barangay variables, and household models used variables from all three levels. The estimation of the propensity score used variables from own data collection as well as geographical data.

Because we included the lagged value of the outcome variable in estimating the propensity score, for each outcome variable a new propensity score had to be estimated. The list of covariates other than the lagged outcome was kept consistent over the models, with a few changes in some impact fields. In the case of no panel information on the outcome but only 2016 information being available, the lagged outcome was not included.

[23] *This approach of propensity score matching conditional on lagged outcome variables is a semi-parametric alternative to the DID model. A comparison of both models is done in annex 7.1.7.*

Figure 12: Propensity score matching conditional on lagged outcome



Source: Own figure.

Table 22 gives an overview of variables used in each of the models. Variables at municipal level included socio-economic characteristics such as income class[24], city classification (in contrast to the more rural municipality), and number of households. As a proxy of unobservable characteristics of politicians in the municipality, the experience of the mayor was included. Variables on further projects controlled for the influence of other donors. For barangay models, covariates on population and geographic characteristics such as coastal exposure, location, remoteness or islands were added. For household models, household characteristics were added. These include socio-economic variables of the household and the respondent such as household size, education, and age. Assets were included as proxy for wealth. As a proxy to knowledge of the respondent on politics, a question of information behaviour were included. Variables on the location of the household proxy its geographic capital.

Table 22: Models at different levels

Model	Level of matching variables	Type
Municipality	Municipality	Lagged outcome variable Socio-economic variables Geographic variables Further projects Yolanda indicator
Barangay	Barangay	Lagged outcome variable Demographic variables Geographic variables
	Municipality	Socio-economic variables Geographic variables

[24] *There are six income classes. Classification differentiates between city and municipality. A first-class municipality has an average annual income of Philippine Peso (PHP) 55 million or more, while the sixth-class has below PHP 15 million. In comparison, a first-class city has an average annual income of PHP 400 million or more and a sixth-class has below PHP 80 million. The income class is based on average annual income over the last four years.*

Model	Level of matching variables	Type
		Further projects Yolanda indicator
Household	Household	Lagged outcome variable Socio-economic variables Information behaviour Geographic variables
	Municipality	Socio-economic variables Further projects Yolanda indicator

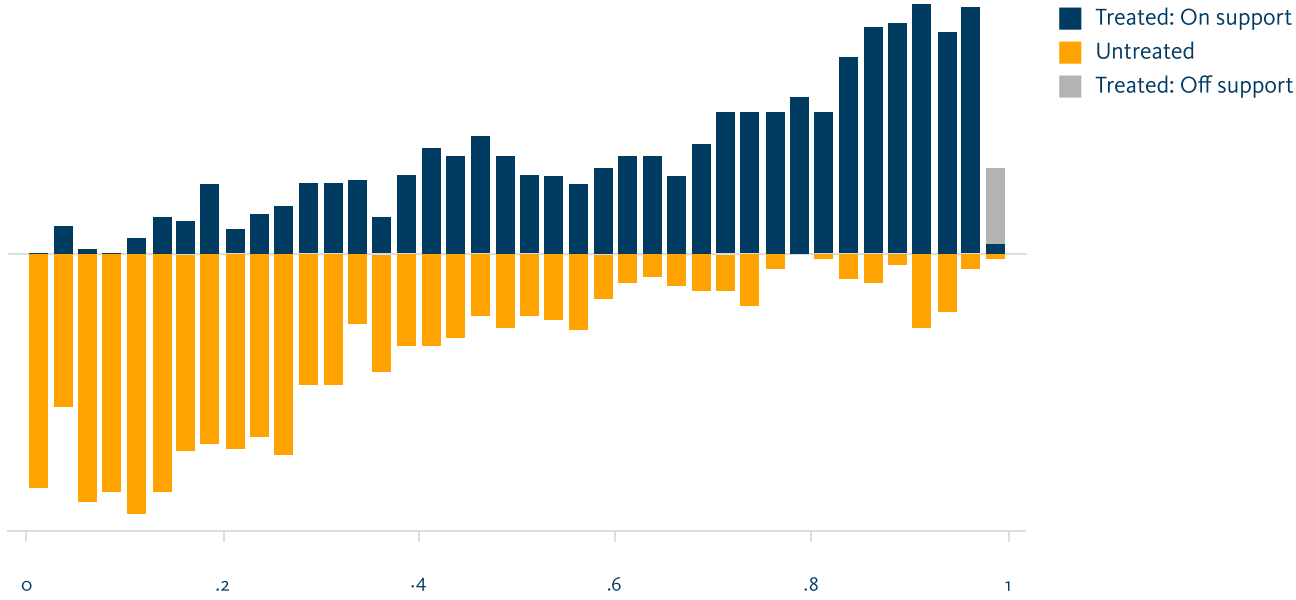
In the following, one of the household models is presented as example. Table 23 shows the probit model used for estimating the propensity score, based on the above-mentioned variables. Figure 13 presents the propensity scores of control and intervention group, and shows the broad overlap of propensity scores; only a few observations have to be excluded.

Table 23: Probit model for estimation of propensity score

Dep. Var: Treat A			Coefficient	Standard error
Household variables				
Lagged outcome variable				
Protected area		0= no, 1 = yes	-0.11	0.12
Socio-economic variables				
HH size	Household size	numeric	-0.01	0.01
Gender	Gender of respondent	0 = male, 1 = female	0.07	0.07
Age	Age of respondent	numeric	0.00	0.00
Elementary	Respondent has elementary education or lower	0= no, 1 = yes	-0.01	0.09
College	Respondent has college education or higher	0= no, 1 = yes	0.11	0.09
Farm	Households main income source: farming	0= no, 1 = yes	0.00	0.11
Business	Households main income source: own business	0= no, 1 = yes	-0.04	0.08
Asset	Asset index (0-1) including durable assets & infrastructure	numeric	0.03	0.24
Information behaviour				
TV	Respondent watches news on TV daily	0= no, 1 = yes	0.00	0.10
Geographic variables				
Region 6	Region 6	0= no, 1 = yes	-0.02	0.32

Dep. Var: Treat A			Coefficient	Standard error
Altitude (log)	Altitude of HH location	meter	-0.25*	0.13
Dis muni hall (log)	Distance to municipal hall	meter	-0.05	0.07
Dis coast (log)	Distance to coast	meter	-0.01	0.09
Municipal variables				
Socio-economic variables				
City	Simplified city classification	0= no, 1 = yes	-1.46***	0.50
Municipal income class	Municipal income class 2011	numeric	0.14	0.15
Number of HH (log)	Household population	numeric	0.05	0.22
Years of mayor	Mayor has been in office for more than 7 years	0= no, 1 = yes	-0.25	0.32
Further projects				
PHL agency programmes	Recipient of PHL agency programmes	0= no, 1 = yes	0.14	0.41
Other donor support	Barangays recipient of other donor support	0= no, 1 = yes	-0.53*	0.30
German assisted	Recipient of German assisted development projects	0= no, 1 = yes	0.16	0.36
German assisted economic	Recipient of German assisted economic development projects	0= no, 1 = yes	0.83***	0.36
GIZ EnRD	Recipient of GIZ EnRD in 2012 (without NRG component)	0= no, 1 = yes	1.23	0.35
Affectedness by typhoon Yolanda				
Yolanda	Affected by typhoon Yolanda	0= no, 1 = yes	-0.43	0.38
cons			-0.16	2.47
N				2028

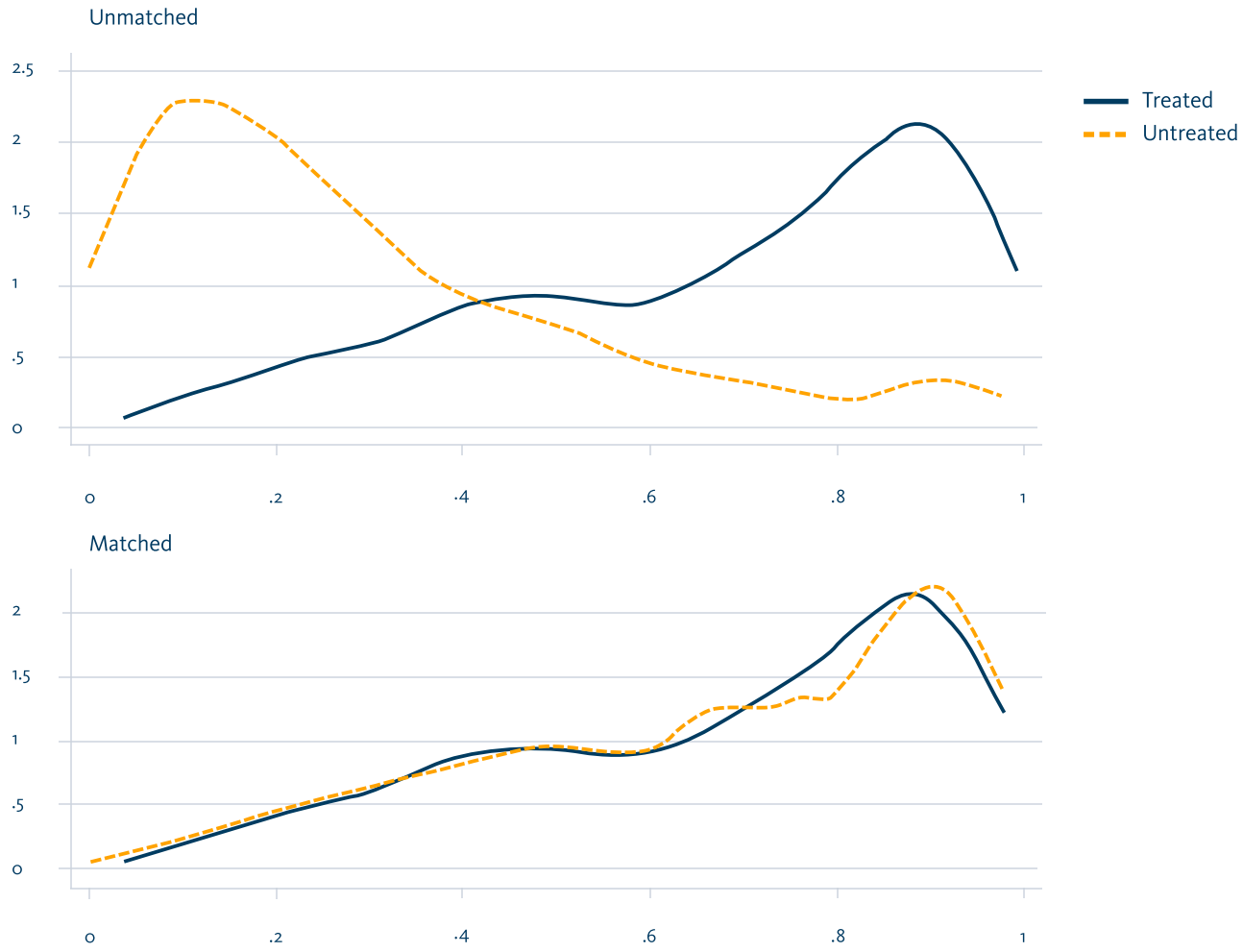
Figure 13: Common support of propensity score



Source: Own figure.

For matching based on this propensity score, we used kernel matching. With kernel matching, a counterfactual is created as a weighted average of all control observations under common support. In comparison to other matching approaches, more information is used (Caliendo and Kopeinig, 2005). Figure 14 describes the distribution of the propensity score before and after matching. It shows that matching led to a reduction of differences between intervention and control group. The successful matching can also be seen in Table 24. The table shows descriptive statistics for all covariates included in the matching. It presents differences based on mean of control and intervention group before the matching, and after the matching. All significant differences between intervention and control were eliminated by matching. Additionally, p-values of the likelihood ratio tests also suggested joint significance of the covariates of the propensity score estimation before matching, and joint insignificance after. The intervention and control group could thus be regarded as having similar observable characteristics.

Figure 14: Distribution of propensity score before and after matching



Source: Own figure.

The ATT of the intervention regarding this respective outcome could now be calculated as difference of means of intervention and control group. Results regarding the different outcome variables are presented in the following Table 24.

Table 24: Balancing of covariates for the estimation of the propensity score

		Before Matching				Before Matching			After Matching		
Variable	N	Mean	SD	Min	Max	Mean Con-trol	Mean Treat	Diff	Mean Con-trol	Mean Treat	Diff
Household variables 2012											
Lagged outcome variable											
Protected area	2533	0.40	0.49	0	1	0.38	0.42	0.04	0.44	0.43	-0.02
Socio-economic variables											
HH size	2992	5.01	2.29	1	19	5.14	4.97	-0.17	5.02	4.98	-0.04
Gender	3000	0.73	0.45	0	1	0.73	0.71	-0.03	0.70	0.71	0.01

		Before Matching				Before Matching			After Matching		
Age	2999	47.28	15.80	18	110	46.50	47.77	1.26	46.26	47.78	1.52
Elementary	2999	0.36	0.48	0	1	0.37	0.35	-0.02	0.38	0.35	-0.03
College	2997	0.25	0.43	0	1	0.24	0.26	0.02	0.24	0.26	0.02
Farm	2993	0.35	0.48	0	1	0.36	0.35	-0.02	0.41	0.35	-0.06
Business	2993	0.18	0.39	0	1	0.18	0.18	0.01	0.17	0.18	0.01
Asset	3000	0.32	0.22	0	1	0.31	0.33	0.02	0.31	0.33	0.02
Information behaviour											
TV	3000	0.55	0.50	0	1	0.55	0.55	0.00	0.53	0.55	0.02
Geographic variables											
Region 6	3000	0.45	0.50	0	1	0.50	0.37	-0.13	0.23	0.36	0.13
Altitude (log)	2666	26.72	39.40	0	299	3.73	3.55	-0.18	3.72	3.57	-0.15
Dis muni hall (log)	2666	4016	3583.35	7.51	28750.55	8.81	8.66	-0.16	8.85	8.67	-0.17
Dis coast (log)	2666	3545.12	5272.56	0.44	30363.2	7.88	7.70	-0.18	7.79	7.72	-0.07
Municipal variables											
Socio-economic variables											
City[1]	3000	0.12	0.33	0	1	0.17	0.07	-0.11	0.04	0.07	0.02
Income class[1]	3000	3.21	1.32	1	5	3.19	3.32	0.13	3.28	3.31	0.03
Number of HHs (log)	3000	7091.70	6829.01	1041	47119	9.51	9.36	-0.15	9.27	9.36	0.08
Years of mayor	3000	0.47	0.50	0	1	0.51	0.40	-0.11	0.32	0.40	0.09
Further projects											
PHL agency prog.	3000	0.83	0.38	0	1	0.78	0.89	0.10	0.85	0.89	0.04
Other donor support	3000	0.52	0.50	0	1	0.59	0.45	-0.14	0.42	0.46	0.04
German	3000	0.34	0.47	0	1	0.22	0.49	0.266***	0.45	0.49	0.04
German economic	3000	0.33	0.47	0	1	0.16	0.54	0.385***	0.50	0.53	0.04
GIZ EnRD	3000	0.53	0.50	0	1	0.33	0.79	0.46***	0.78	0.79	0.01
Affectedness by typhoon Yolanda											
Yolanda[2]	2533	0.40	0.49	0	1	0.38	0.42	0.04	0.44	0.43	-0.02

Notes: Data are from own data collection if not remarked otherwise. [1] Secondary data from Local Government Performance Measurement System 2011 of the DILG. [2] Data source described in section 7.1.3. For variables that enter regression as log, normal values are given regarding the total sample.
* p<0.10, ** p<0.05, *** p<0.01.

7.1.2 Sample selection

Participation in the SIMPLE intervention was not random but influenced by administrative and logistical reasons as well as the willingness of municipalities to participate (self-selection). It is possible that these factors also influence outcome variables. To select an appropriate sample of control municipalities, municipalities had to be chosen that match the intervention in those characteristics. To do so, all 271 municipalities in the region 6 and 8 were included as sampling frame. Of those, 37 municipalities did receive the intervention, 234 did not. For matching, we estimated the probability of participating in the intervention with a probit model based on covariates from the secondary administrative data of the Local Governance Performance Measurement System (LGPMS) from 2011. The model included covariates regarding geography and administration, population, and economy of the municipalities.[25] After estimating a propensity score for each of the 271 municipality, the three municipalities nearest to the PS of each intervention municipality were selected as possible controls. The selection of the final 63 control municipalities was done based on a qualitative assessment to ensure the plausibility of the selected control municipalities in terms of comparability to the intervention, accessibility, and/or political unrest.[26]

Within each municipality, three barangays were selected randomly and proportionally to household population.[27] The barangays were stratified in urban and rural areas; two barangays were randomly chosen from the rural stratum and one from the urban stratum.[28] A sample of ten households was randomly selected in each barangay following a random-route selection strategy. In 2016, the same municipalities, barangays and households were visited again. All municipalities and barangays were re-interviewed. The attrition rate in the household survey was relatively low at 11.03% given four years between the two rounds of data collection and typhoon Yolanda. Missing households were replaced in barangays with attrition rates over 20%.

7.1.3 Geographic analysis

During the process of data collection, locations of individual households, barangay halls, and municipal buildings were geocoded. This allowed for analyses of patterns of spatial diffusion and a contextualization of the living and environmental conditions of households, barangays, and municipalities.

Additional geographic data, available under free license agreements, was collected from third-party sources. Analyses with these data could be replicated. Linking the original and the public data, we generated an index of typhoon affectedness for municipalities and households.

Assessment of typhoon Yolanda's effect on municipalities

Between 7 and 9 November 2013, super typhoon Yolanda (Haiyan) made landfall in Eastern Samar before passing through the San Pablo Bay and through Leyte. The destructions and devastation caused by the typhoon were substantial in both region 8 and region 6, and the reconstruction efforts were received also in sampled municipalities.

Due to the devastating effect of typhoon Yolanda in the survey region, we used geographic data to approximate the effect of the typhoon on the sampled municipalities. Besides official statistics derived from damage assessment reports (Del Rosario, 2013), we developed an assessment of the affectedness of municipalities and barangays based on data obtained from the Global Forecast System's (GFS) "global forecast model". Using recorded data on 50km spatial resolution, we approximate the 10-minute peak wind speed in municipalities using Ordinary Least Squares Regression (OLS). The calculation is based on the distance from the track of the storm and then classified into areas of storm intensity.

[25] *Geography and administration: province, total land area, number of barangays in the municipality, environment in the municipality (rural/urban), whether the ecosystems of the municipality included coastal or forest ecosystems. Population: population size, number of households in the municipality. Economic factors: whether fishery and commercial/service sectors were economic activities in the municipality.*

[26] *For more information on sampling see previous report on the intervention (Garcia Schustereder et al., 2016).*

[27] *Data on household population were taken from Local Government Performance Measurement System 2011 of the Department of the Interior and Local Government, National Statistics Office Census 2007.*

[28] *The barangay classification between rural and urban was obtained from the National Statistical Coordination Board (NSCB) at the time of survey (2012).*

As wind speeds only partially capture typhoon affectedness, we also assessed coastal exposure relative to storm rotation. Eastern and northern coasts, as well as coasts without barrier islands or sounds, were most affected by storm surges, as indicated by larger death tolls and damage to property. Affectedness of municipalities and barangays was thus coded as a dummy variable based on wind speeds and coastal exposure. A cross-check based on the correlation coefficient between model-derived wind speed and casualties in percent of municipal population (based on the data presented in the official report (2013)) shows a correlation coefficient of r=0.27 (wind speed) and r=0.40 for wind speed and coastal exposition.

Simplified, household-level assessment of natural hazards

To further contextualize survey data, extensive geographic data were collected and processed to develop a model of hazard exposure. High-resolution spatial data (30m cell size) for the Visayas region allows for an in-detail analysis of environmental conditions of households and barangays. For terrain analysis, we used data from the National Aeronautics and Space Administration (NASA) Shuttle Radar Topography Mission (SRTM), and combined these with data on rivers, streams, and water bodies from Open Street Map (OSM) as well as data on global forest cover by Hansen et al. (2013).

Areas prone to coastal flooding were identified based on terrain height (<5m Mean Sea Level (MSL)), and river flooding based on a 40m river buffer. Areas prone to landslide were identified by the combination of slope of the terrain cell (<18 degrees) and relative forest cover (<50%). Areas prone to volcanic hazards were identified based on a 15km buffer zone surrounding active volcanoes.[29]

Inclusion of geographic factors

The above-described data was used to construct geographic variables used in the propensity score matching and as outcome variable. Propensity score matching at household level included distances of households from the coastline and municipal hall. Missing data on locations of municipal halls were imputed using satellite imagery and maps. Information on terrain heights of household locations is based on SRTM data. Moreover, the extent to which municipalities were affected by Yolanda was included as binary variable in the propensity matching of all models.

To analyse change in forest cover, we drew on time series data of the Hansen et al. (2013) Global Forest Cover dataset. Using 2005 as the baseline, we subtracted forest loss and added forest gain until the latest data in 2014. To minimize the distortion caused by forest cover loss due to typhoon Yolanda, we excluded the year 2013 from the assessment.

7.1.4 Cross-sectional topic: Typhoon Yolanda

From an analytical standpoint, the effects of typhoon Yolanda could alter the outcomes of the intervention and lead to distorted treatment effects. A systematic assessment of the affectedness between intervention and control municipalities is necessary to assess potential differences. Significant differences in affectedness might bias the observed effects in econometric models.

Table 25 presents a descriptive comparison of intervention and control sites with regard to affectedness by typhoon Yolanda. The comparison is based on geographic data (section 7.1.3) and self-reported affectedness as reported by municipal planning officers. The results suggest that intervention and control sites are not differently affected by the storm to any degree of statistical significance. While the self-reported affectedness is substantially higher compared to the external measurement, again there are no statistically significant differences between intervention and control municipalities.

[29] *The criteria are closely related to the official hazard classification by the Philippine Mines and Geoscience Bureau (MGB).*

Table 25: Comparison of the effects of typhoon Yolanda between treatment and control municipalities

Indicator	Description	Intervention sites		Control sites		P-Statistics
		Affected	Not affected	Affected	Not affected	
Wind speed	Affectedness by typhoon strength wind speeds	36%	64%	50%	50%	0.173
Wind speed + Coastal exposition	Affectedness by typhoon strength wind speeds + coastal exposition to storm surge	16%	84%	24%	76%	0.365
Self-reported affectedness by MPDO	"Was your LGU or parts of your LGU affected by the effects of typhoon Yolanda?"	79%	21%	83%	17%	0.571

Note: n= 100; * p<0.10, ** p<0.05, *** p<0.01.

Table 26 presents the results of the official damage assessment report presented by the Philippine authorities (Del Rosario, 2013). Due to the effects of different population size between treatment and control sites (mostly attributed to the distorting effect of urban areas in region 8), we have based the calculation on the percentage of affected population.

In contrast to the results presented in Table 25, the comparison of casualties, injured, and missing population from the damage assessment report partially suggests statistically significant results. Intervention sites show a higher percentage of missing population (sig. p<0.05) compared to control sites. The percentage of casualties of total population is higher in intervention sites as well, but does not reach the 10% threshold of significance.

Table 26: Reported effects of typhoon Yolanda from the official damage assessment report in intervention and control sites

Indicator	Mean Total (Std. Dev.)	Mean Intervention sites (Std. Dev.)	Mean Control sites (Std. Dev.)	F-statistics
Reported casualties (% of total population)	0.070% (0.30 %)	0.125% (0.427 %)	0.027% (0.114 %)	2.73
Reported injured (% of total population)	0.428% (1.69 %)	0.312% (1.280 %)	0.519% (1.966 %)	0.37
Reported missing (% of total population)	0.008% (0.038 %)	0.017% (0.056 %)	0.002% (0.007%)	3.95 **

Note: n= 100; * p<0.10, ** p<0.05, *** p<0.01.

While the effects of typhoon Yolanda on the affected population have been substantial, and differ in their effects on individual areas depending on their geographic location (for instance the high number of casualties in Tacloban was mostly caused by the severe storm surge in the San Pablo Bay), we have no clear evidence for a strongly differentiating effect for the affectedness between intervention and control municipalities. We therefore believe that the incidence of Yolanda does not heavily bias our effect estimates.

7.1.5 Diffusion analysis

A large literature has shown that innovation diffusion among states, sub-national units, and households is a wide-spread phenomenon. It is thus reasonable to assume that land-use planning in the Philippines provides no exception. Whereas the spread of policies among units is beneficial with regard to the impact of policy interventions, the interdependence of units poses challenges for causal inference. In line with this reasoning,

we address the challenges emanating from the lack of independence among observed units to achieve valid inference.

The methodological challenge stems from the fact that diffusion of treatment effects violates the assumption of non-interference among units. The assumption that units are independent underlies the quasi-experimental approach applied in this evaluation (cf. Rubin, 1980). Where treatment affects not only local government units (LGU) targeted in the intervention but also spreads to LGUs that are part of the control group, the clear distinction between treated and untreated units of observation vanishes. If LGUs without intervention adopt – by whatever means – innovative techniques of land-use planning from neighbouring LGUs and subsequently improve the quality of land-use plans, we can attribute these improvements to the intervention. Experimental designs ignoring diffusion, however, estimate intervention effects based on differences between clearly defined intervention and control groups. Hence, where effects of interventions spill over, estimation strategies that do not account for such effects underestimate the effects of the intervention.

Our empirical strategy to approach the spatial nature of the intervention is to measure cross-unit effects regarding the output of the programme. We then isolate those LGUs from the control group for which we find cross-unit effects. This prevents erroneous non-findings of intervention effects due to the confounding influence of a "diffusing treatment".

To identify diffusion of outputs we apply three steps (Anselin, 1988; LeSage and Pace, 2009; Ward and Gleditsch, 2008). First, we identify proxies for the output of the intervention. To operationalize the intervention output, we rely on an index measuring the quality of land-use plans.

In a second step, we determine which units are to be considered neighbours. This specifies a network through which we expect the diffusion mechanisms to operate. Spatial models assume that we know the true network through which the intervention diffuses (Lee, 2009). However, we do not precisely observe how improvements in land-use planning might spread between LGUs. In light of this difficulty, we apply a range of different connectivity criteria and decide between connectivity criteria based on model fit. To construct candidate networks, we use two distance metrics: geographical distance and travelling time. We operationalize the former via border contiguity, k-nearest neighbours, sphere of influence, and minimum-distance thresholds (via travelling time data from Google Maps and OSM). Figure 15 illustrates the resulting matrices by showing connections between LGUs based on OSM travel distance. We consider LGUs to be connected if the travel time between municipal halls lies below 60 minutes according to data from OSM.[30]

In a third step, we test for spatial autocorrelation among LGUs using Moran's I (Moran 1950a,b);

$$I = \frac{n}{\sum_i \sum_j w_{ij}} \frac{\sum_i \sum_j w_{ij}(y_i - \bar{y})(y_j - \bar{y})}{\sum_i (y_i - \bar{y})^2}$$

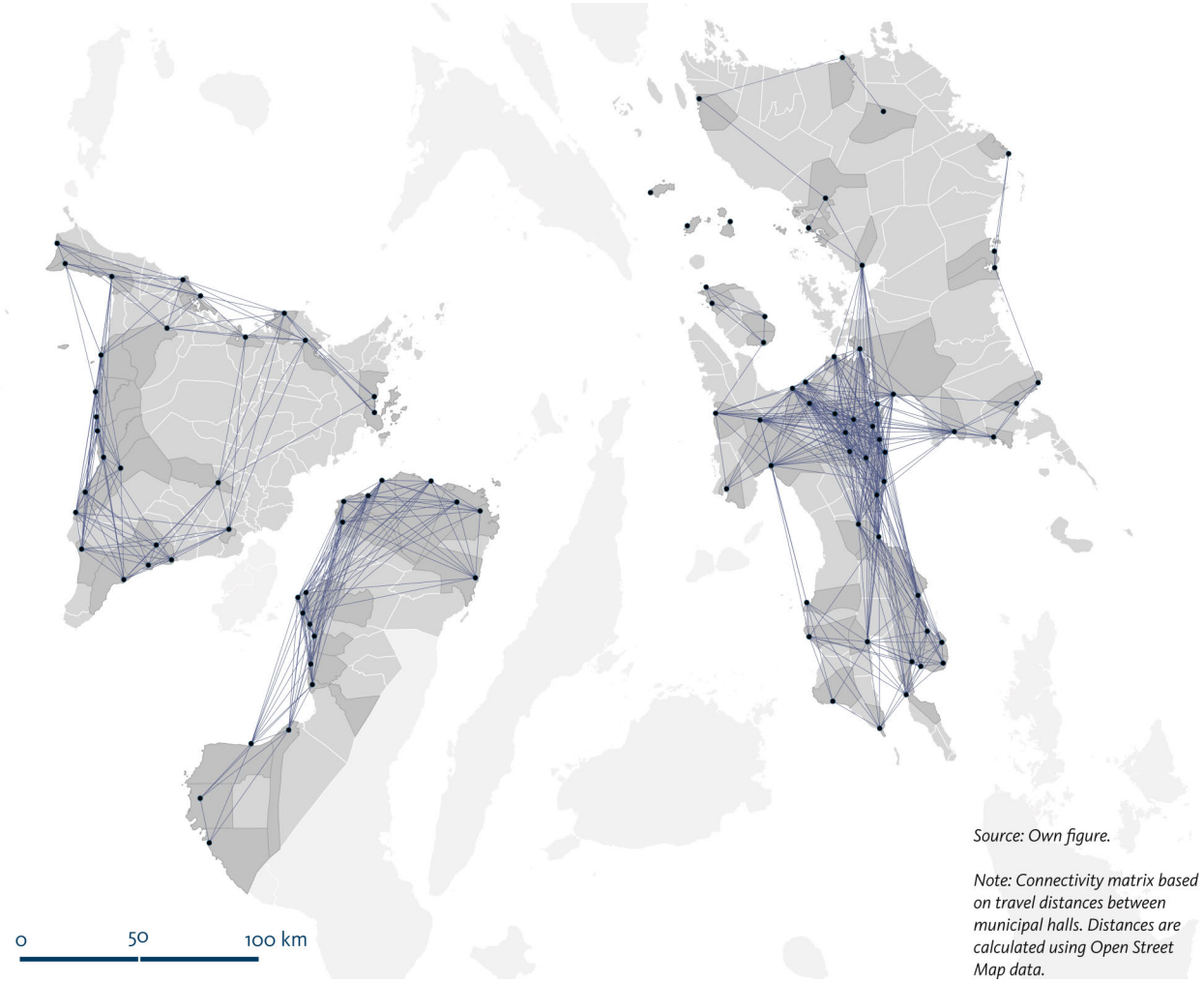
where y is the variable of interest, w_{ij} the spatial weights matrix, and n the number of LGUs. High values of Moran's I indicate similarity among neighbouring units. Moran's I compares the relationship between the quality of plans in LGUs and the quality of plans in neighbouring LGUs. A positive value indicates clustering; a negative value indicates a chessboard-like pattern. We assess spatial clustering visually as well as statistically.

Faced with six different specifications of weights matrices, we need to choose among them. For all six specifications of connectivity (using row-standardized weights), we find a positive and statistically significant Moran's I.[31] Following Kooijman (1976), we draw on the connectivity matrix that maximizes spatial autocorrelation. This is the connectivity matrix based on travel time, as provided by OSM data.

[30] *All six resulting graphs are positively correlated, with a graph correlation coefficient between 0.37 and 0.78 indicating that they indicate similar spatial relations between LGUs (Zhukov and Stewart, 2013).*

[31] *These results are robust for testing against the null hypothesis of normal distribution and of random distribution, Moran's I based on permutation, Barndorff-Nielsen's saddle point approximation, and the exact test. The results are also robust for different specifications of travel time.*

Figure 15: Connections between LGUs based on travel time between municipal halls based on Open Street Map data



Source: Own figure.

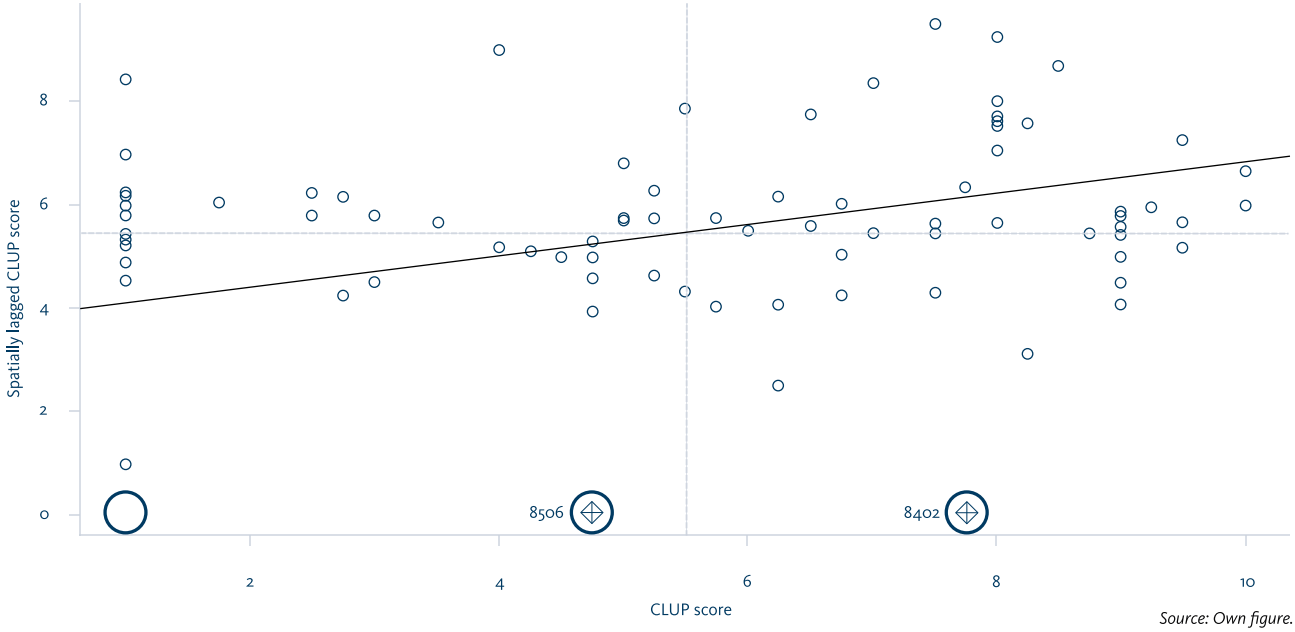
Note: Connectivity matrix based on travel distances between municipal halls. Distances are calculated using Open Street Map data.

This result has implications regarding the estimation strategy in this evaluation. The presence of spatial autocorrelation violates the assumption of non-interference among municipalities. The diffusion of intervention effects among municipalities might lead to an underestimation of the effects of the intervention. Consequently, spatial patterns need to be taken into account in the analysis.

To improve the results of our matching estimators, we identify those municipalities that show strong patterns of spatial autocorrelation. Since we would assume these LGUs to be contaminated by the intervention in neighbouring municipalities, we isolate them from the control group.

Figure 16 illustrates the pattern of spatial clustering. The plot shows the quality of land-use plans (x-axis) conditional on the arithmetic mean of the quality of land-use plans of neighbouring units (y-axis). The slope of the regression line shown in the figure is the Moran's I statistic. All cases in the above right and below left quadrant have plans that are similar in quality to their neighbours. Cases in the above left and below right quadrant differ from their neighbours. The figure illustrates the pattern of positive spatial autocorrelation, as evidenced by the fact that there are comparatively more cases in the above right and below left quadrant. Put differently, the quality of land-use plans in a municipality resembles the quality of land-use plans of its neighbours.

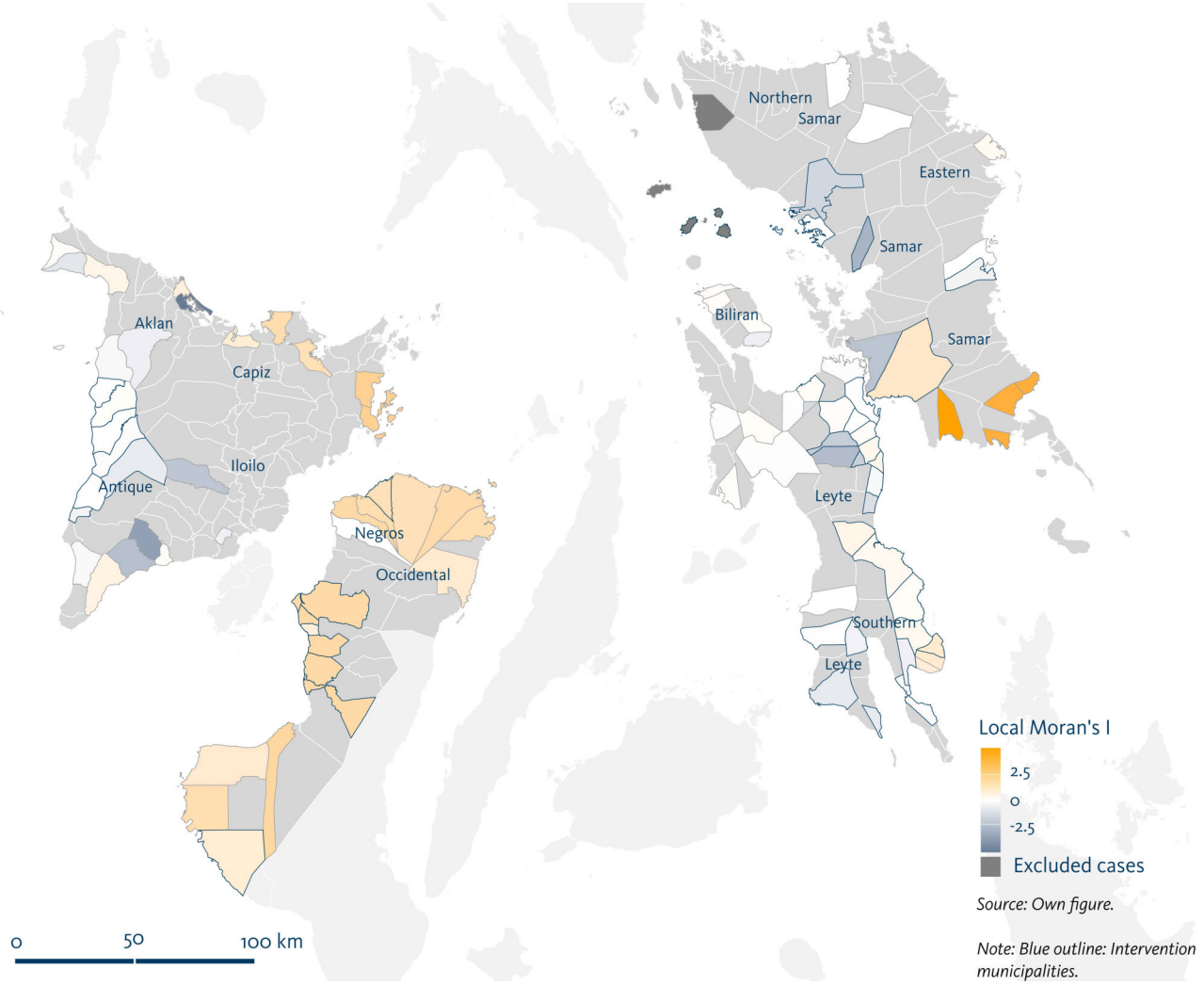
Figure 16: Moran scatterplot indicating the pattern of spatial clustering



Source: Own figure.

We identified contaminated municipalities by estimating the Local Moran's I statistic (Anselin, 1995). The Local Moran's I is a local indicator of spatial association. It is shown in Figure 16. It indicates spatial clustering for individual municipalities, thereby spatially disaggregating the Global Moran's I statistic above. We isolate those municipalities from our matching estimation, which show significant patterns of positive spatial autocorrelation and belong to the control group.

Figure 17: Local Moran's I statistic and treatment of LGUs



Source: Own figure.

Note: Blue outline: Intervention municipalities.

7.1.6 Document analysis

To take account of the varying comprehensiveness of usability of CLUPs, a document analysis was applied in both the intervention and control municipalities. In total, 84 CLUPs or CLUP-related documents were identified in 100 municipalities.[32] The evaluation team reviewed the existing municipal CLUP documents to evaluate their correctness, completeness, and integrity. The document analysis included both the plans and written documents and ordinances of the CLUP. The assessment followed a standardized procedure based on the CLUP documents:

1. *The Comprehensive Land Use Plan*, with an assessment of the current land use in municipal territory, the formulation of planning goals as well as cartographic representation of prospective land use.
2. *The Zoning Ordinance* outlines zoning principles and describes zone classification, comprises zoning maps as well as describing zone boundaries and specifies allowed, and forbidden land use. Furthermore, it comprises regulations and defines penalties for the violations of land-use regulations.

[32] *No documents were available in 10 control municipalities and in 6 in intervention municipalities (of those were 2 non-disclosed cases in intervention municipalities).*

3. *Sectoral and Special Area Studies* is a comprehensive report on several sectoral topics relevant to the municipality enhanced by statistical data and further thematic maps.

We consider a plan to be qualitatively good if the planning documents fulfil the minimal criteria for completeness based on the land-use planning guidelines of the HLURB (possess the necessary plans and documentation in each volume) as well as if information and representation allow a trained user easy access and understanding of the topics presented. Furthermore, information on the coverage of various sectoral topics such as disaster risk management was assessed. The results of the CLUP document analysis were fed into the quantitative data analysis on the municipal level and used in the impact assessment on the outcome level of the intervention.

7.1.7 Matching conditioning on lagged outcomes in comparison to DID-matching

The econometric model applied in the impact evaluation is a matching approach conditional on lagged outcomes. This approach is comparable to the difference-in-differences (DID) approach in combination with matching, which is often applied in the literature. However, matching conditional on lagged outcomes has the advantage of not relying on the common trends assumption and of fully exploiting the panel nature of the data. The following explains and compares both approaches.

Matching conditioning on lagged outcomes

The idea of matching conditional of lagged outcomes builds on the approach of regression on lagged outcomes under the assumption of unconfoundedness. This approach uses a linear regression to determine the treatment effect and directly exploits the panel nature of the data by including lagged outcomes in the regression. It assumes unconfoundedness given lagged outcomes ("What makes them special is their outcome pre-treatment") and assumes linearity. Put differently, the model assumes that adding a lagged outcome as predictor removes biases from the comparison of treatment and control group.

$$Y_{i1} - Y_{i0} = \gamma + \delta(G_i) + \beta Y_{i0} + \varepsilon_i \quad (1)$$

where Y_{i0} and Y_{i1} are the outcomes of units under treatment and control, respectively.

Based on this assumption of unconfoundedness given lagged outcomes (but not requiring the assumption of linearity), Lechner (2011) describes a matching estimation conditional on pre-intervention outcomes as a strategy for the estimation of treatment effects. Lechner (2011) sees this possibility as a strong advantage of panel data: including the pre-intervention outcome variable improves the fit of the control group, as differences in pre-treatment outcome influence post-treatment outcomes.

DID-matching

Matching conditional on lagged outcomes is an alternative approach to the often used DID approach in combination with matching. The DID approach applies a "before–after" design. A matching conducted before DID reduced imbalances in observed pre-intervention covariates and therefore supports the common trend assumption. The treatment effect is, in simple terms, calculated as difference in outcomes between intervention and control group at the time of the initial survey (before the intervention) minus the difference in outcomes at the endline (after the intervention). While this approach allows the control of unobserved characteristics, causal inference is based on the assumption of common trends (time invariant selection bias) in outcomes in both groups in the absence of intervention (Angrist and Pischke, 2009).

The difference-in-differences model can be calculated with repeated cross-sectional data. Individual i belongs to a group, $G_i \in \{0,1\}$ (where group 1 is the intervention group and 0 the control group), and is observed at two points in time: $T_i \in \{0,1\}$. X_i is a vector of covariates.

In the DID model, the population average difference over time in the control group ($G_i = 0$) is subtracted from the population average difference over time in the intervention group ($G_i = 0$) to remove biases associated with a common time trend unrelated to the intervention.

The treatment effect (on the treated) can be estimated using OLS, as described by the reduced form regression as follows (notation following Cerulli (2015), adapted from Imbens and Wooldridge (2009)).

$$Y_i = \mu + \beta G_i + \gamma T_i + \alpha D_i + \beta X_i + \varepsilon_i \quad (2)$$

Where the treatment effect on the treated (ATT) is estimated as coefficient α of the interaction term $D_i = G_i * T_i$.

With panel data, different possibilities of calculating a DID exist. The DID can be calculated as pooled OLS (as in (1)), or as Fixed Effects/First Differences Model (2). Both models result in the same estimand for the ATT.

$$\Delta Y_{it} = \Delta\gamma_t + \alpha D_{it} + \beta\Delta X_{it} + \Delta\varepsilon_{it} \quad (3)$$

Where ΔY_{it} is the difference in the outcome variable between t_1 and t_2, D_{it} indicates intervention, ΔX_{it} describes a vector of time-variant covariates, which enters the regression as difference between 2012 and 2016. The coefficient α describes the ATT. As both estimations (2) and (3) result in the same estimand for the ATT, this method does not directly exploit the panel nature of the data (Imbens and Wooldridge, 2009: 68)).

Comparison of DID-approaches and PSM-based approaches

DID and matching conditional on past outcome variables impose different restrictions on the data. The advantage of DID is that it controls for time-constant-omitted variables. Its disadvantage is the assumption of common trends. In contrast, matching does not rely on the common trends assumption, but assumes, that – conditional on the pre-intervention outcome – there are no confounding unobservables that influence the post-intervention outcome. One might argue, however, that including the pre-intervention outcome already controls for part of possibly confounding unobservables.

Which assumptions hold depends on the selection mechanism and has to be decided case by case (Lechner, 2011: 191). If the estimated coefficient of the lagged outcome variable is close to zero, there will be little difference between the models. This is also true if intervention and control groups have similar average outcomes in the pre-intervention period (Imbens and Wooldridge, 2009), which is the goal of an additional matching before DID.

The literature is undecided on which model to prefer. Imbens and Wooldridge (2009: 70) come to the general conclusion that matching is preferable to DID if panel data are available: "It is difficult to see how making treated and control units comparable on lagged outcomes will make the causal interpretation of their difference less credible, as suggested by the DID assumptions." Chabré-Ferret (2015) compares results from DID and matching conditioning on pre-intervention outcomes, and finds that DID performs well – as long as individuals do not change their behaviour pre-intervention in anticipation of the intervention. For the households in our case this was unlikely. He finds matching conditioning on pre-intervention outcomes to be biased, but that the bias shrinks with an increase in covariates included in the matching. In a review of studies from Heckman et al. (1997) as well as Smith and Todd (2005), Chabré-Ferret (2015) finds additional support for the superiority of DID matching (under certain conditions) over matching conditioning on pre-intervention outcomes.

A combination of DID and matching on pre-intervention outcomes (such as including pre-intervention outcomes as covariates) is identical to matching, as taking the difference, while keeping the pre-intervention difference constant, results in ignoring the differences – and therefore requires the unconfoundedness assumption (Lechner, 2011: 191).

7.2 Annex: Index creation

7.2.1 Approach to creating indices

Indices used as outcome variable or in the matching are computed using different approaches:

Aggregative indices are calculated using mean-value scales of two or more variables; missing variables are excluded. Additive indices are calculated using simple additive indices of individual variables; missing variables are treated as missing. Latent constructs (for instance *trust*) are calculated using factor analysis with unrotated factor matrix; indices calculated using factor analysis are standardized to a range from 0 – 1 or to a range from -1 – +1.

7.2.2 Indices used in Impact field 1

Name of Index	Included Variables	Computation	Cronbach's Alpha
CLUP - usability	1) Comprehensibility of information: Vision and Mission Statement (1 – low; 10 high) 2) Ease of finding information about hazards in your barangay (1 – low; 10 high) 3) Ease of finding information about building requirements for residential development (1 – low; 10 high) 4) Ease of finding information about zones for commercial and non-agricultural buildings (1 – low; 10 high)	Aggregative index calculation based on equally weighted sub-indicators (1 – low; 10 high)	α = 0.885
CLUP – Vol.1 comprehensiveness	1) Status quo assessment of land use (1 – Yes; 0 – No) 2) Description of future land use (1 – Yes; 0 – No) 3) Description of goals for future land use (1 – Yes; 0 – No) 4) Current land-use map (1 – Yes; 0 – No) 5) Planned land-use map (1 – Yes; 0 – No)	Additive index. Scores 1 if all answers are ticked with "yes; otherwise 0.	α = 0.905
CLUP – Vol.2 comprehensiveness	1) Description of general zoning principle (1 – Yes; 0 – No) 2) Definition of terms (1 – Yes; 0 – No) 3) Divisions of zones into districts (1 – Yes; 0 – No) 4) Zoning map (1 – Yes; 0 – No) 5) Zone boundary description (1 – Yes; 0 – No) 6) Land-use regulation (1 – Yes; 0 – No) 7) Penalties for violations (1 – Yes; 0 – No) 8) Zoning maps of barangays (1 – Yes; 0 – No)	Additive index. Scores 1 if all answers are ticked with "yes; otherwise 0.	α = 0.982
CLUP – Vol.3 comprehensiveness	1) Demography (1 – Yes; 0 – No) 2) Physical environment (1 – Yes; 0 – No) 3) Housing (1 – Yes; 0 – No) 4) Health (1 – Yes; 0 – No) 5) Education (1 – Yes; 0 – No) 6) Protective services (1 – Yes; 0 – No) 7) Social welfare (1 – Yes; 0 – No) 8) Industry (1 – Yes; 0 – No) 9) Commerce and trade (1 – Yes; 0 – No) 10) Transportation (1 – Yes; 0 – No) 11) Power (1 – Yes; 0 – No) 12) Water (1 – Yes; 0 – No) 13) Communication (1 – Yes; 0 – No) 14) Solid waste management (1 – Yes; 0 – No)	Additive index. Scores 1 if all answers are ticked with "yes; otherwise 0.	α = 0.989

7.2.3 Indices used in Impact field 3

Name of Index	Included Variables	Computation	Cronbach's Alpha	Factor loading
Planning and infrastructural DRM	1) Permanent relocation of vulnerable population (1 – Yes; 0 – No) 2) Created ease ways and cleared flood-prone areas (1 – Yes; 0 – No) 3) Established new "no-build" zones (1 – Yes; 0 – No) 4) Improved LGU infrastructure to withstand natural disasters (1 – Yes; 0 – No) 5) Changed construction requirements for buildings in the LGU (1 – Yes; 0 – No)	Latent index based on factor analysis with unrotated factor matrix	α = 0.668	1) 0.541 2) 0.672 3) 0.589 4) 0.764 5) 0.748
Immediate shock response	1) Established early warning systems (1 – Yes; 0 – No) 2) Improved information of population about natural hazards (1 – Yes; 0 – No) 3) Established quick disaster response measures (1 – Yes; 0 – No) 4) Established LGU-wide buffer sticks of vital goods (1 – Yes; 0 – No)	Latent index based on factor analysis with unrotated factor matrix	α = 0.468	1) 0.391 2) 0.403 3) 0.371 4) -0.058
HH / community shock reduction / mitigation	1) Implemented drills and trainings for the case of disasters (1 – Yes; 0 – No) 2) Supported or initiated community initiatives for disaster preparedness (1 – Yes; 0 – No) 3) Financial incentives for HHs to invest in disaster / emergency preparedness (1 – Yes; 0 – No) 4) Set up disaster relief funds for HH in case of future (1 – Yes; 0 – No) 5) Built new shelters for temporary relocation (1 – Yes; 0 – No)	Latent index based on factor analysis with unrotated factor matrix	α = 0.883	1) 0.269 2) 0.280 3) 0.164 4) 0.274 5) 0.201
HH DRM strategies: reduction	HH DRM Index: Social risk management strategies directed at reduction of risks or shock extent (standardized between 0-1). 1) Improvements to the roof, wall or floor of house 2) Improvements to the house with elevation, stilts, flood walls, balcony or higher floor 3) Relocation of entire household or household members (in anticipation of hazards) 4) Other activities since 2012 to prepare for hazards 5) Information of household head and household members what to do in case of hazards 6) Measures taken to better protect assets of household in case of hazards 7) Preparation for potential evacuation (e.g. prepared bags, transport)	Latent index based on factor analysis with unrotated factor matrix	α = 0.7127	1) 0.7326 2) 0.5469 3) 0.4189 4) 0.4473 5) 0.6619 6) 0.6730 7) 0.7345
HH DRM strategies: diversification	HH DRM Index: Social risk management strategies directed at diversification of risks (standardized between 0-1). 1) Diversification of household income sources 2) Membership in risk-sharing group(s)	Latent index based on factor analysis with unrotated factor matrix	α = 0.5335	1) 0.4635 2) 0.8330

Name of Index	Included Variables	Computation	Cronbach's Alpha	Factor loading
	3) Intensified ties with other households, families in preparation of shocks			3) 0.8366
Community DRM strategies	Community DRM Index: Households supporting community risk management strategies (standardized between 0-1). 1) Helped to improve community infrastructure to be better prepared for hazards 2) Helped to improve community early warning procedures and systems 3) Helped in building or improving evacuation centres 4) Helped in community activities improving emergency, rescue and evacuation 5) Participation in community planning activities how to cope with potential shocks	Latent index based on factor analysis with unrotated factor matrix	α = 0.8897	1) 0.8553 2) 0.8304 3) 0.8402 4) 0.8534 5) 0.7904
HH DRM strategies: expenditure	Expenditure for DRM strategies (Philippine Pesos) 1) Improved roof, wall, floor of house 2) Improved house with elevation, stilts, flood walls, higher balcony for DRM 3) Improved hazard protection of agricultural land 4) Improved protection of household assets 5) Insurance expenditure (property, production insurance) 6) Insurance expenditure for personal insurance (life, health, accident)	Total expenditure aggregate		

7.2.4 Indices used in Impact field 4

Name of Index	Included Variables	Computation	Cronbach's Alpha	Factor loading
Index of barangay participation in LGU planning*	Index of barangay participation in LGU planning based on several items measuring barangay participation 1) LGU asked for Barangay Development Plan 2) LGU asked about needs of barangay 3) LGU invited barangay captain to municipal planning and development board (MPDB) 4) LGU involved barangay captain in sectoral studies 5) LGU involved other people from barangay in sectoral studies 6) LGU involved barangay captain in drafting parts of the CLUP	Latent index based on factor analysis with unrotated factor matrix, standardized 0-1	α = 0.8969	1) 0.7265 2) 0.7583 3) 0.8036 4) 0.8433 5) 0.8504 6) 0.7594
Participation of HH in planning activities	Index of participation of households in planning activities (planning, implementation, monitoring, evaluation) 1) Participation in planning 2) Participation in implementation 3) Participation in monitoring 4) Participation in evaluation	Latent index based on factor analysis with unrotated factor matrix, standardized 0-1	α = 0.9520	1) 0.9027 2) 0.9382 3) 0.9528 4) 0.9497

Name of Index	Included Variables	Computation	Cronbach's Alpha	Factor loading
Disclosure of planning and project information improved+	Index of perception of households that disclosure of planning and project information has improved 1) Change in disclosure of planning information 2) Change in disclosure of project information (municipal projects)	Latent index based on factor analysis with unrotated factor matrix, standardized 0-1	α = 0.8424	1) 0.9294 2) 0.9294
Index of enforcement of zoning ordinance / principles+	Index of enforcement of zoning ordinance and zoning principles at municipal level 1) Not giving new permissions for constructions 2) Advises resettlement 3) Enforces resettlement 4) Advises change of land use 5) Enforces change of land use	Latent index based on factor analysis with unrotated factor matrix, standardized 0-1	α = 0.782	1) 0.6488 2) 0.6272 3) 0.6979 4) 0.7394 5) 0.7657
Index of functioning of local government officials	Index of functioning of local government officials (responsiveness and performance of three levels of LGU officials), perception at barangay level 1) Performance of mayor 2) Performance of vice mayor 3) Performance of konsehal sa munisipyo (as a whole) 4) Responsiveness of mayor 5) Responsiveness of vice mayor 6) Responsiveness of konsehal sa munisipyo (as a whole)	Latent index based on factor analysis with unrotated factor matrix, standardized 0-1	α = 0.9185	1) 0.8520 2) 0.8527 3) 0.8318 4) 0.8488 5) 0.8556 6) 0.8134
Index of functioning of local government officials	Index of functioning of local government officials (responsiveness and performance of three levels of LGU officials), perception at household level 1) Performance of mayor 2) Performance of vice mayor 3) Performance of konsehal sa munisipyo (as a whole) 4) Responsiveness of mayor 5) Responsiveness of vice mayor 6) Responsiveness of konsehal sa munisipyo (as a whole)	Latent index based on factor analysis with unrotated factor matrix, standardized 0-1	α = 0.9368	1) 0.8590 2) 0.8763 3) 0.8655 4) 0.8675 5) 0.8952 6) 0.8718
Quality of barangay processes	Index of ratings concerning the quality of barangay processes (sample based on only those households who had participated in any barangay consultation), perception at household level 1) Attendance 2) People 3) Time management 4) Consensus-making	Latent index based on factor analysis with unrotated factor matrix, standardized 0-1	α = 0.8487	1) 0.8062 2) 0.8635 3) 0.8177 4) 0.8329
Trust index+	Trust index consisting of willingness and unwillingness to fulfil functions, and general trust, perception at household level 1) Trust in willingness of local government unit 2) Trust in willingness of local government unit (inverted, as it asked for vested interest) 3) General trust in local government unit	Latent index based on factor analysis with unrotated factor matrix, standardized 0-1	α = 0.6082	1) 0.8221 2) 0.6044 3) 0.8291

Name of Index	Included Variables	Computation	Cronbach's Alpha	Factor loading
Index: Public services/infrastructure improved (perception)+	Index of perception that several public services/social services/infrastructure have improved (perception at barangay level) 1) Environmental quality (e.g. pollution, sewage, solid waste, air quality) 2) Social services 3) Infrastructure 4) Health care services 5) Protection from natural hazards	Latent index based on factor analysis with unrotated factor matrix, scale -1 to 1	α = 0.6577	1) 0.4832 2) 0.8135 3) 0.6496 4) 0.7643 5) 0.6053
Index: Public services/infrastructure improved (perception)+	Index of perception that several public services/social services/infrastructure have improved (perception at household level) 1) Change in condition and services of barangay hall 2) Change in condition and services of rural health centre (BHU or BHS) 3) Change in condition and services of day care centre 4) Change in condition and services of primary or elementary school 5) Change in overall condition of road to market 6) Change in overall road condition of the roads in this LGU 7) Change in agricultural extension services by LGU 8) Change in solid waste disposal services by LGU 9) Change in provision of drinking water by LGU 10) Change in electricity infrastructure in the LGU	Latent index based on factor analysis with unrotated factor matrix, scale -1 to 1	α = 0.7706	1) 0.5686 2) 0.5634 3) 0.6177 4) 0.4866 5) 0.5715 6) 0.5640 7) 0.6211 8) 0.5785 9) 0.5655 10) 0.5939

Note: Indices marked with + are calculated using only endline information.

7.2.5 Indices used in Impact field 5

Name of Index	Included Variables	Computation
Income	Comparable aggregate, available for 2012 and 2016 data. 1) Gross agricultural and business income 2) Wage income (private, public employment, casual labour) 3) Transfer income (remittances, pensions) 4) Other income (rent, interest, other)	Additive index, outlier (median + 3 SD) cleaned and replaced by component. Per year, PPP-$
Consumption	Aggregate only available for 2016 data. 1) Food consumption (expenditure + in kind) 2) Non-food consumption (incl. education, transportation, communication)	Additive index, outlier (median + 3 SD) cleaned and replaced by component. Per year, PPP-$
Asset index	Asset index incl. durable assets and infrastructure, based on panel data available for 2012 and 2016, following World Bank definition. 1) Variables on house quality and access to improved water source 2) Land ownership 3) Durable household assets: Computer, refrigerator, electric fan, stove, air-condition, washing machine, motor vehicle, mobile phone.	Multiple correspondence analysis (MCA) with categorized items and dummy variables. Standardized between 0-1.

Name of Index	Included Variables	Computation
Improved sanitation	Based on UNICEF definition	
Access to improved water	Based on UNICEF definition	
Poverty headcount	Based on regional poverty line. Poverty lines per capita and day (PPP-$): 2012: Region 6: 2.80; Region 8: 2.81. 2016: Region 6: 3.33; Region 8: 3.37 (Data from Philippine Statistical Office). Welfare measure is income, weighted at household level.	

Note: Monetary values converted to constant 2011 international Dollar (PPP-$). Conversion rates Philippine Pesos, PHP to PPP-$ based on World Bank data: 2012:17.8841, 2016: 18.2107.

7.3 Annex: Overview of land-use planning interventions by GIZ

	Country / Region	Duration	Level of implementation	Main Intervention Goals	ICD	T&M	TCD	CSP	SRC	HIS
Land Management / Cadaster, Serbia	Serbia	2003 – 2009	National Municipal	Improvement of national land management system with the National Geodetic Authority. Improve data usage of local level. Implement GIS usage at local planning administrations.		✓	✓		✓	
Strengthening Municipal Land Management	Serbia	2015 - 2015	National Municipal	Improve planning techniques (participatory / smart growth / land valuation), urban development. Strengthening rural development and rural land management (2013 – 2015).		✓	✓			
Land Administration Project (LAP)	Bosnia and Herzegovina	2006 - 2011	National	Unification of previous projects cadaster and land registry and World Bank land registration. Support of effective and efficient land administration. Harmonization of cadaster and land registry.		✓	✓			✓
Municipal Land Management Montenegro	Montenegro	2004 - 2012	National Municipal	Improvement of legal security of real estate and land-use resources in municipal planning and administration tasks. Improve municipal tax collection. Standardization of spatial plans.			✓			
Land Management Georgia	Georgia	2000 - 2007	National Municipal	Upscaling of previous land use and urban planning interventions in Tbilisi to whole Georgia. Develop cadaster, land title register and registration. Improve spatial and urban planning based on cadaster. Improve legal security on real estate property in Georgia.		✓				✓
Promotion d'une Politique Foncière Responsable au Bénin (ProPFR)	Benin	2016 – 2019	National Municipal Village	Improvement of tenure security and access to land for marginalized groups. Improve institutional framework conditions with ministries and public institutions & private investors.	✓			✓		
Improvement of Land Governance in Uganda to increase the productivity of small-scale farmers in private Mailo land (IGLU) Responsible Land Policy in Uganda (RELAPU)	Uganda	2017 - 2020	National Municipal Village	Improvement of tenure security and access to land for marginalized groups.	✓			✓		

	Country / Region	Duration	Level of imple-menta-tion	Main Intervention Goals	ICD	T&M	TCD	CSP	SRC	HIS
Enhancement of Land Tenure Security (ELTeS) Land Management and Decen-tralized Planning (LMDP)	Lao PDR	2015 - 2017	National Province Municipal Village	Establish a system for systematic land registration. Establish land-use planning on different administrative level. Establish binding zoning principles. Mediate conflicts between rivalling land users (for instance private land investors).	✓	✓	✓	✓		
Support to Land Reform	Namibia	2017 - 2020	National Municipal Village	Implementing land reform strategy: Improvement of land registration. Improvement of land use and regional planning. Improvement of sectoral plan integration and bottom-up par-ticipatory planning.	✓	✓	✓			
Reconstruction and Disaster Risk Management	Guatemala	2007 -	National Municipal Village	Participatory Disaster Risk Management Development of Hazard maps in cooperation with national DRM authorities. Community-based DRM project implementation.			✓	✓		
Mapping Resource Uses and Community Strength to En-sure Sustainable Use of Re-sources within Conservation Areas	Peru		National Village	Implementing village-based management plan to harmonize environmental protection and ensuring rural livelihoods.			✓	✓		
Land-Use Planning in Bolivia: Combining Watershed Man-agement, Disaster Risk Man-agement and Food Security	Bolivia		National Village	Reduction of vulnerability to natural hazards by enhancing self-help capacity of local farming communities.			✓	✓		
Climate Change Adaptation by Participatory Planning	Tonga		Village	Increase resilience of households against impacts of climate change by GIS-mapping.				✓		
Land-Use Planning in Mali	Mali		Province Municipal Village	Solve and prevent land-use conflicts at communal, inter-com-munal level through cooperation.			✓	✓		
Land-Use Planning in Cambo-dia	Cambodia		Different levels	Improve Planning Capacities at different administrative levels. Improve land allocation. Implement GIS and data manage-ment Enhance work on thematic hotspots (e.g. post-conflict / envi-ronment).	✓	✓	✓	✓		

	Country / Region	Duration	Level of imple-menta-tion	Main Intervention Goals	ICD	T&M	TCD	CSP	SRC	HIS
Stärkung der Beratungskapazi-täten für Landpolitik in Afrika – SLGA (Part of Sonderinitia-tive: „Eine Welt ohne Hunger“ (SEWOH))	Africa		National	Implement human capacity development capacities Implement scientific network of excellence for land policy in Africa. Support the African Union in its implementation of the land agenda. Conduct applied research projects.	✓				✓	

Note: ICD = Institutional Capacity Development, T&M = Staff training and mentoring, TCD = Technical Capacity Development, CSP = Civil-society Participation, SRC = Science and Research Cooperation, HIS = Harmonizing different Intervention schemes.

8. DIGITAL ANNEX: FURTHER DOCUMENTATION

Further documentation can be found in the digital annex of the evaluation:
http://www.deval.org/en/impact-diffusion-and-scaling-up-of-a-comprehensive-land-use-planning-approach-in-the-philippines.html

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