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Synergies and trade-offs between SDGs at the sub-national scale

POLICY BRIEF

Developed by: 'Luanhe Living Lab' project team

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This document is the second of two project briefs developed as part of the ‘'Living laboratories for achieving sustainable development goals across national and sub-national scales' (known for short as the **‘Luanhe Living Lab’**) project, funded by NERC (UK), NSFC (China) and JST (Japan). The aim of the research was to provide scientifically-grounded, policy-relevant information on the synergies and trade-offs between selected sustainable development goals and targets within the Luanhe River Basin in China.

This policy brief is targeted at the international research and policy-making community.

Project Website *https://luanhelivinglab.home.blog/*

Related SDG interactive tool: *https://sdginterlinkages.iges.jp/luanhe/index.html*

Project Research Brief: *https://luanhelivinglab.home.blog/2020/12/04/lessons-learnt-from-synergies-and-trade-offs-between-sdgs-at-the-sub-national-scale-research-brief/*

Cover image: The Luanhe River, China

Source: Photograph by the Luanhe Living Lab team, October 2019.

KEY MESSAGES

Target audience: members of the international research and policy-making community, especially those who are responsible for shaping policy related to the SDGs at national and sub-national scales.

Rationale: The Sustainable Development Goals (SDGs) adopted by the General Assembly of the United Nations in September 2015 are driving most development policies globally. With 17 goals, 169 targets, and 231 unique indicators to monitor and track progress of, countries may lose sight of the synergies and trade-offs between goals and targets. To address this concern, approaches are being developed to identify and quantify synergies and trade-offs at the national level, but there has been a limited focus at the sub-national scale.

This policy brief builds upon the previous research brief[1] that set out to understand how national level policies related to the SDGs impact development at the sub-national scale. The observations were based on a case study in the Luanhe River Basin (LRB), China but are highly relevant to other river basins in China and Internationally.

Key policy recommendations:

- A series of policies **promoting afforestation** in the LRB are promising and should continue to be implemented in the future. A sustainable ecological compensation mechanism between upstream and downstream regions for increasing financial transfer payments to upstream ecological protection areas should be refined and effectively implemented.
- Water bodies play important roles in provisioning services, regulating services, cultural services and ecological integrity, particularly in terms of freshwater provision. Trans-provincial eco-compensation schemes (between Tianjin and Hebei) should be established and effectively implemented to maintain the engagement of residents and government in water sources areas to **protect water quality and quantity**.
- Built-up land areas are projected to increase under future land use scenarios. In order to minimise the negative impacts on human well-being, planning policies should aim to **balance urban expansion and ecological protection** in the LRB.
- Full-scale **flood risk assessment** should be conducted across the whole basin and embedded in the integrated development policies to minimise the flood losses and ensure long-term sustainability. Policy-makers must carefully consider the trade-offs between urban development and the potential threat from flooding, which is expected to be exacerbated by climate change.
- Climate change is expected to drier and increase the frequency of intense extreme weather events in the LRB, which may increase the water scarcity in the LRB. Thus, **sustainable water systems management policies under changing climate** must be considered and put in place to better protect people and their properties and sustain socio-economic development.
- Key infrastructure, especially large dams and reservoirs, can provide important protection to the downstream population in terms of substantially reducing the number of people at high risk of flooding. However, if a dam fails, the resulting flood may cause catastrophic consequences to downstream people and assets, which is not considered in this study. Therefore, the role of large **engineering infrastructure systems** in the basin's future development and the synergies and trade-offs between different SDGs should be carefully assessed and considered when developing long-term development strategies. It is anticipated that the synergies and trade-offs assessment tool developed through this project can be used for this purpose.

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[1] For more information about the research project, please refer to '[Research Brief: Lessons learnt from synergies and trade-offs between SDGs at the sub-national scale, published online 2020]'

Understanding the synergies and trade-offs between SDGs

The Sustainable Development Goals adopted by the General Assembly of the United Nations in September 2015 are driving many development policies globally. With 17 goals, 169 targets, and 231 unique indicators to monitor and track progress of, countries may lose sight of the synergies and trade-offs between goals and targets, a fact that is readily acknowledged (Nilsson et al., 2016; Zhou, et al., 2019). Understanding how the goals/targets interact is extremely important to:

1) minimise trade-offs and maximise synergies;
2) avoid wasting resources; and
3) ensure equitable partnerships and ultimately, equitable development internationally, at the national scale and within countries.

To address this concern, approaches are being developed to identify and quantify synergies and trade-offs at the national level, but there has been limited focus at the sub-national scale. Within large countries, sub-national considerations are important as climatic, ecosystem, land-use and political sub-divisions are rarely coincident leading to interactions between the goals that may be quite different from those observed at national scale.

The rationale

Land use and land use change are anthropogenic drivers influencing climate change, aquatic and terrestrial ecosystems, disaster risk, livelihoods, human settlement, economic growth (in particular productive agriculture) and social systems (agriculture and non-agriculture employment, tenure system, etc.) in terms of both temporal and spatial scales. These drivers can cause wider and long-term indirect impacts: for example, loss in livelihoods can drive persistent poverty. Sustainable land use and planning is therefore an essential basis for achieving SDGs 1 (No Poverty), 2 (Zero Hunger), 5 (Gender Equality), 6 (Clean Water and Sanitation), 7 (Affordable and Clean Energy), 8 (Decent Work and Economic Growth), 11 (Sustainable Cities and Communities), 13 (Climate Action) and 15 (Life on Land). Achieving one purpose of land use may undermine achieving other purposes. Also, land use and land use change in one region may impact on other regions. For example, forest clearance for agricultural farming in the upstream can adversely impact on freshwater use in the downstream areas and exacerbate landslide and flood risks locally and flood risk along downstream parts of the catchment.

In addition, national policy for addressing a specific issue, such as conservation of river sources by designating protected areas for selected major rivers, will constrain land use and associated development in the upstream water source areas. Without proper compensatory policies in place, such as for example, payment for ecosystems services through collection of water tariffs in the downstream areas, upstream areas will suffer from the trade-offs from the national policy implementation.

Key findings of the study[2]

The aim of this study was to provide scientifically-grounded, policy-relevant information on the synergies and trade-offs between selected sustainable development goals and targets at the sub-national level. It is hypothesised that trade-offs between SDG goals and targets at the sub-national scale create inequalities between segments of society when attempting to achieve the SDGs at the national level. We worked in China's Luanhe River Basin (LRB) (see Figure 1) as a sub-national level case study to investigate how land use and land use change impact on flood risk and ecosystem services and disservices and more broadly at SDGs 6, 7, 11 and 13, with potential additional relevance to Goals 1, 2, 8 and 15.

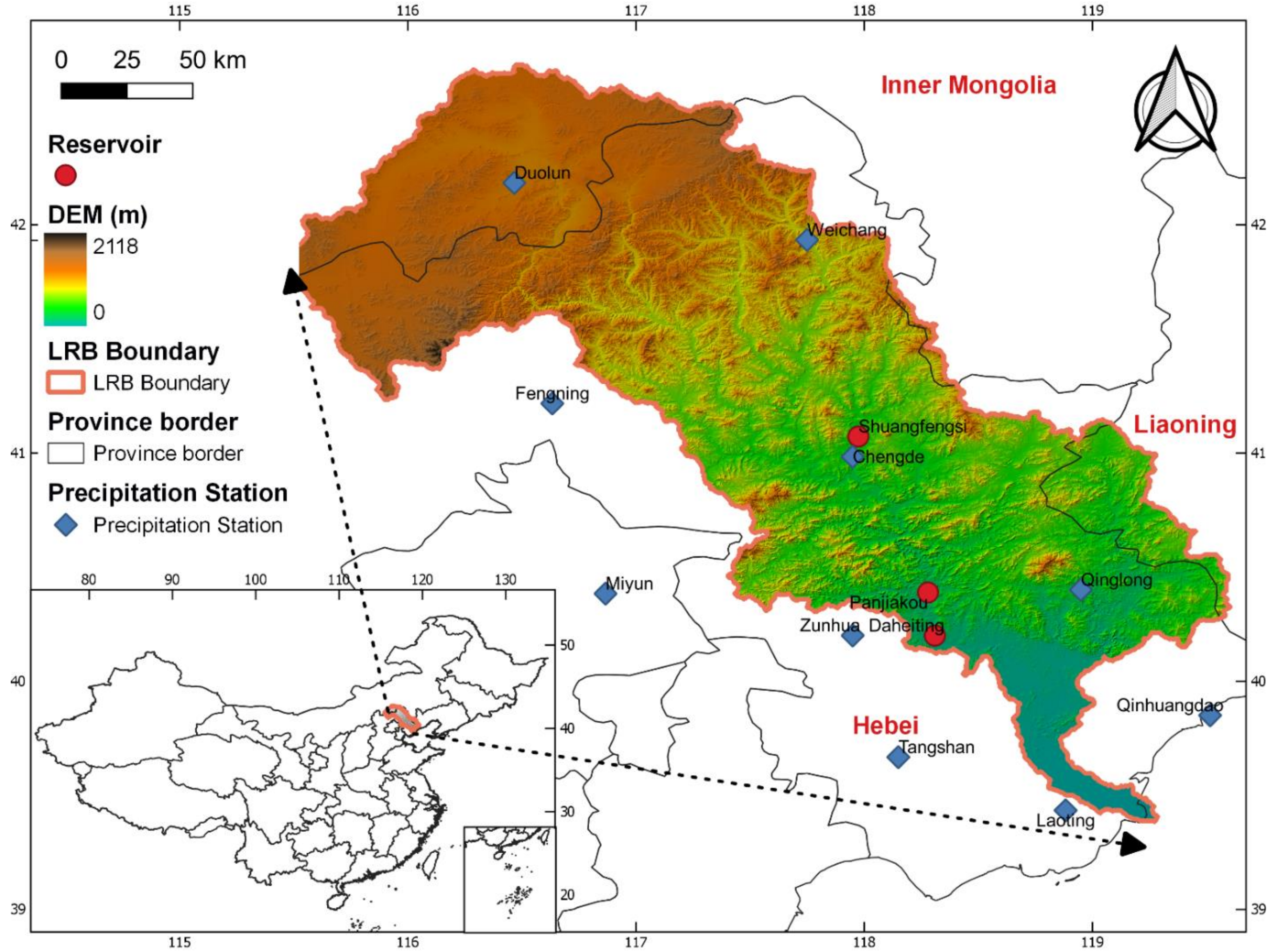

Figure 1: Overview map of the LRB

To test the research aim, four specific objectives were addressed.

1) **Future land-use change scenarios** were developed for the LRB (see Table 1). This component was participatory by engaging with different levels of stakeholders, ranging from regional leaders to representatives of national authorities, supplemented by analysis of historical land-use changes in the basin as influenced by past and current policies.

[2] Research Brief: Lessons learnt from synergies and trade‐offs between SDGs at the sub-national scale (2020)

Table. 1. The four land use change scenarios

	Scenarios	Description
A	*Trend*	Business as usual
B	*Expansion*	High-speed economic development. Marking the upper end of the scenario literature in fossil fuel use, food demand, energy use and greenhouse gas emissions.
C	*Sustainability*	Emphasis on economic growth shifts towards a broader emphasis on human well-being.
D	*Conservation*	The socioeconomic context of the *Sustainability* scenario was used as a baseline for the *Conservation* scenario and extended by the implementation of the ecological restoration and protection policy targets (e.g. afforestation).

2) Future flood risk was predicted and assessed for the different land use and climate change scenarios. The **modelling specifically accounts for the effects of rapid urbanisation in the basin as well as aspects of reservoir operation**. Model outputs were used to analyse and quantify the impact on future flood risk, and water quality, and therefore supports the identification of trade-offs between different SDGs.
3) **Ecosystem services and disservices for different land uses and land use change scenarios** have been analysed for the entire basin. This analysis used participatory approaches, notably expert panels. Changes in ecosystem services have been estimated for the different scenarios.
4) The **SDG Interlinkages Tool**, has been extended to operationalise it at the basin scale and visualise the synergies and trade-offs between selected SDGs across various counties in the LRB.

The main findings of the study (which are elaborated upon in the Research Brief) are:

- The **implementation of future ecological restoration projects and protection policies** could be an important component of climate change mitigation strategies for the attainment of the SDGs and thus should receive greater attention.
- A series of **policies promoting afforestation in the LRB for biodiversity conservation and sand fixation**, are promising and should continue to be implemented in the future, or even the formulation of more ambitious greening or afforestation policies could be considered in the future. However, **a sustainable development trade-off needs to be preserved to maintain other provisioning services such as food** which remains important given the rapid urban expansion taking place.
- Attention to **environmental management and sustainable management of land systems** should be directed to **reducing water pollution and encouraging water conservation** to achieve SDGs.
- Careful consideration should be given to **balance socio-economic development and the variation of flood risk in the future,** minimising flood-related losses to ensure sustainable development of LRB.
- Planning policies that aim to **balance urban expansion and ecological protection** in the LRB should be implemented.
- A comprehensive policy package including reasonable water distribution, eco-compensation and coordinated protection measures was suggested to **address the trade-offs with constrained economic growth and unemployment caused by national land-use planning for the protection of water resources and associated restrictions for development activities** in the mid-and upstream.
- **Working with local stakeholders** has helped the team to evaluate and validate the usability of project outputs (i.e. policy briefs, maps, guidance) to ensure they are appropriate for adoption by local stakeholders.

Policy recommendations

The LRB plays a significant role in storing and capturing carbon and mitigating carbon emissions. Our simulation demonstrates that the large areas of forests in the LRB continue to be the largest carbon storages in both the vegetation and the soil in the future. The forests not only play the most important carbon storage in the LRB, but also represent hotspots for almost all other ecosystem services, meaning that forests should be the land use type of greatest concern in the land management of the LRB. The upper part of the LRB was defined as an important 'windbreak and sand-fixing area' of Beijing and Tianjin (see Figure 2).

1) A series of **policies promoting afforestation** which have been implemented since 2015 in the LRB for sand fixation and biodiversity conservation, such as 'National Forest Management Planning (2016-2050)', 'Land greening planning of Hebei Province (2018-2035)', 'Implementation plan of afforestation in Zhangjiakou city and Chengde Bashang area of Hebei Province' are promising and should continue to be implemented in the future; more ambitious greening or afforestation policies could also be considered in the future. However, for **promoting afforestation and protecting downstream regions from wind and sandstorm, animal husbandry, agriculture activities, and the mining industry in upstream regions have to be reduced**. This inevitably has an impact on the livelihood pattern of farmers and herdsmen, and as a result, affects the economic development of upstream regions. A trade-off needs to be preserved to maintain key provisioning services such as food which remains important given the rapid urban extension taking place in the region. **A sustainable ecological compensation mechanism between upstream and downstream regions for increasing financial transfer payments to upstream ecological protection areas should be established and effectively implemented; potentially offering alternative livelihoods through participatory interactions with the communities.**

Figure 2: Qiansongba Artificial Forest Project in Fengning county in the LRB (photo by Jiren Xu)

2) Water bodies play important roles in provisioning services, regulating services, cultural services and ecological integrity, particularly in terms of freshwater provision. Since the 1960s, the LRB has become the 'water source' of Beijing and Tianjin through water storage and diversion projects. However, ecological compensation has not been fully implemented. Chengde city and Qianxi County of Tangshan city have sacrificed local economies for providing water (e.g. ban on cage fish

in Panjiakou and Daheiting reservoirs), but they only received limited compensation from Tianjin (due to higher water use charges). The mechanics of **trans-provincial eco-compensation schemes between Tianjin and Hebei should be established and effectively implemented to maintain the engagement of residents and government in water sources areas to protect the water quality and quantity**.

3) The built-up land areas, which correspond to ecosystem disservice hotspots, are projected to increase under future land use scenarios. In order to minimise the negative impacts on human well-being, **planning policies should aim to balance urban expansion and ecological protection in the LRB**. For example, increasing the surface area of land under nature reserves in urban and peri-urban areas should be considered.

4) The basin-wide inundation areas are predicted to be similar under different land use change scenarios reflecting different future development strategies since for extreme events it is the rainfall processes and basin topography more predominantly determining the inundation rather than the land use. On the other hand, the inundation areas of individual land use types may vary significantly, indicating the change of exposure to flood risk under the different future development strategies. **Results on the diversified flood risks under different land use change scenarios suggest that full-scale flood risk assessment (considering climate change) should be integrated into development planning to minimise the losses from flood and ensure long-term resilience.**

5) The number of people at high risk of flooding is closely linked to the expansion of built-up areas usually occupied by dense population. These built-up areas are more commonly distributed in low-lying areas and floodplains that are vulnerable to flooding (Figure 3). The development strategy following the current trend will see the most substantial expansion of built-up areas, which subsequently puts the largest population at high risk of flooding. Therefore, **policy-makers must carefully consider the trade-offs between urban development and the potential threat from flooding, which is expected to be exacerbated by climate change.**

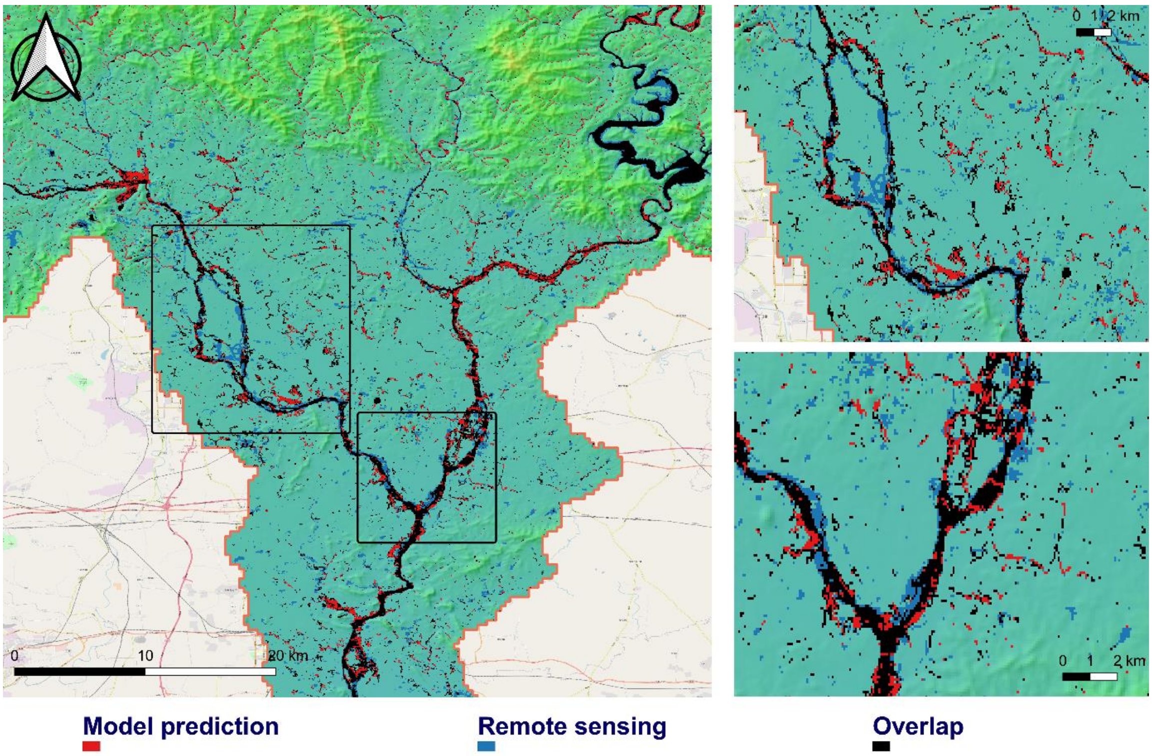

Figure 3: Comparison between the predicted and observed flood extents in the 2012 flood event: the zoomed-in areas located at downstream of Panjiakou reservoir (left); Qianan city (upper right); and Lulong county (lower right).

6) Climate change is expected to increase the frequency and intensity of rainfall in the LRB, which may increase water resources and help mitigate water scarcity in the LRB. However, the more frequent extreme rainfall will increase the risk of water pollution and flooding, and hence, may lead to impoverishment due to the property and life losses as a result of water-related hazards. In future development, **sustainable water resource management policies should take account of climate change and resilience building with the protection of people's life and their properties at the centre of decision-making.**

7) Key infrastructure, especially large dams and reservoirs, can provide important protection to the downstream population in terms of substantially reducing the number of people at high risk of flooding. However, whilst these large infrastructures can create benefits in flood control and provide water resources and hydro-power, they may also impose adverse impacts on the environment and increase the risk of catastrophic flood events due to dam breaks (e.g., Yixun river in the LRB). Reduced velocity and sediment carrying capacity of the flow may lead to the deposit of sediment in the reservoir, gradually reducing its storage capacity and consequently its function of flood control and hydropower generation (Figure 4). Therefore, **the role of these large engineering infrastructure systems in the basin's future development as well as the synergies and trade-offs with different SDGs should be carefully assessed and considered when developing long-term development strategies.**

Figure 4: Miaogong Reservoir, which has entirely lost its capacity and function due to serious sediment deposition (photo by Jiaheng Zhao).

Potential synergies and trade-offs between the SDGs for this study

Water scarcity in the LRB

The Beijing-Tianjin-Hebei (BTH) region is the region in China most severely affected by water scarcity. Although the new South-to-North Water Transfer Project could mitigate part of the water-scarcity issue in the BTH region, the LRB currently still plays an important water supply function for Tianjin city, a key metropolis of the BTH region. The land system changes under future scenarios in the LRB indicate the challenge to achieve the SDG target 6.1 (drinking water for all), target 6.3 (water quality), target 6.4 (address water scarcity), and SDG11 (sustainable cities) in sub-national regions such as BTH.

- Water scarcity in the LRB is likely to increase in the near future. On the one hand, providing sufficient food, increasing productivity and production (SDG target 2.1 and 2.4), and substantially increasing the number of cities and human settlements (SDG target 11.b) will lead to an increase in the water demand in the LRB due to the growth of human population, crop cultivation and grazing, and rapidly changing diets, including greater consumption of animal source foods. However, due to rainfall reduction, land-use change and construction of many small check dams for soil and water conservation, the average annual runoff had decreased by approximately 30 % since the 1980s. By 2040, the sustainable water supply in the LRB will be more challenging due to the warmer and drier climate and more intense extreme weather events.
- On the other hand, nonpoint-source pollution due to anthropogenic activities such as land use is the main factor affecting surface water quality, impacting upon the achievement of target 6.3 (water quality). All future scenarios indicate a significant increase in intensively managed cropland and grassland systems in the LRB. However, the intensive cropping practices (e.g. mechanization) and improved nutrient management (e.g. high agrochemical inputs) for increasing crop and grass yield frequently will result in negative impacts on water quality, including runoff of sediments and agrochemicals to surface waters, as well as biodiversity loss and reductions in cultural services.
- Overall, the results show that the LRB will suffer more from both quantity- and quality-induced water scarcity problems in the future, it is therefore of importance to address the changes in water scarcity under the effect of rapid urbanization, agricultural intensification and the increase in chemical fertilisers. Special attention to environmental management and sustainable land system design must be directed towards reducing water pollution and encouraging water conservation for minimizing the trade-off between SDG 2 (zero hunger), SDG 6 (water), SDG 11 (sustainable cities), and maximizing their synergies.

Flood risk in the LRB

Effective management of flood risk, or disaster risk reduction (DRR) in general, is directly or indirectly embedded in the SDG framework and is a critical aspect to be considered when evaluating the impacts of national and regional development strategies on SDGs. Based on our studies, whilst different development strategies (reflected in land use change) may not lead to substantial changes in the total flooded area across the basin, as this is more directly determined by the basin's hydrology, landscape and topography, the inundated areas of different land use types can be significantly changed. It is therefore necessary to analyse in detail the flood impact on different land use types to better understand the complex relationships between flood risk and socio-economic development and how it subsequently impacts the synergies and trade-offs between SGDs.

- The "Trend" development strategy is predicted to see rapid socio-economic development and substantial expansion of built-up areas. This may positively contribute to SDG 8 in terms of promoting economic growth and providing full and productive employment and decent work for all, and is therefore related to **SDG 1** (No Poverty). However, this will inevitably increase flood inundation of built-up areas and pose higher flood risk to people, properties and business, which will in turn trade-off the achievements of many other SDGs.

- Climate change may increase the frequency and intensity of extreme rainfall, and hence flood risk. Particularly, climate change may substantially increase the number of people affected by high and extremely high risk from flooding, especially the low-income population who are commonly more vulnerable to natural hazards. This may directly affect the realisation of **SDG 1** (e.g., Target 1.5 on building resilience to disasters), **SDG 11** (e.g., Target 11.5 on reducing the adverse effects of disasters), **SDG 13** (e.g., Target 13.1 on strengthening resilience and capacity to climate-related hazards and disasters), among others.
- Meanwhile, different development strategies may influence or intensify climate change to different levels. Construction of key infrastructure, e.g., dams and reservoirs, may help better regulate water resources and protect the downstream people from the flooding damage, but it may also exert negative impacts on the environment and increase the risk of dam-break floods. All these will further complicate the issues and create challenges in evaluating the relationship between development strategies and SDG attainment, as well as the linkages between SDGs.

SDG interlinkages model for the LRB

To reveal the human-environment interactions for achieving the SDGs at the river basin scale, the Driver-State-Impact-Response (DSIR) framework was used to build an SDG interlinkages model to analyse and visualise the cause-effect relationships among human activities, the hydrological cycle and policy responses. The results were validated based on the expert judgement from the project team and customised to the Luanhe River Basin through stakeholder consultations (see Figure 5).

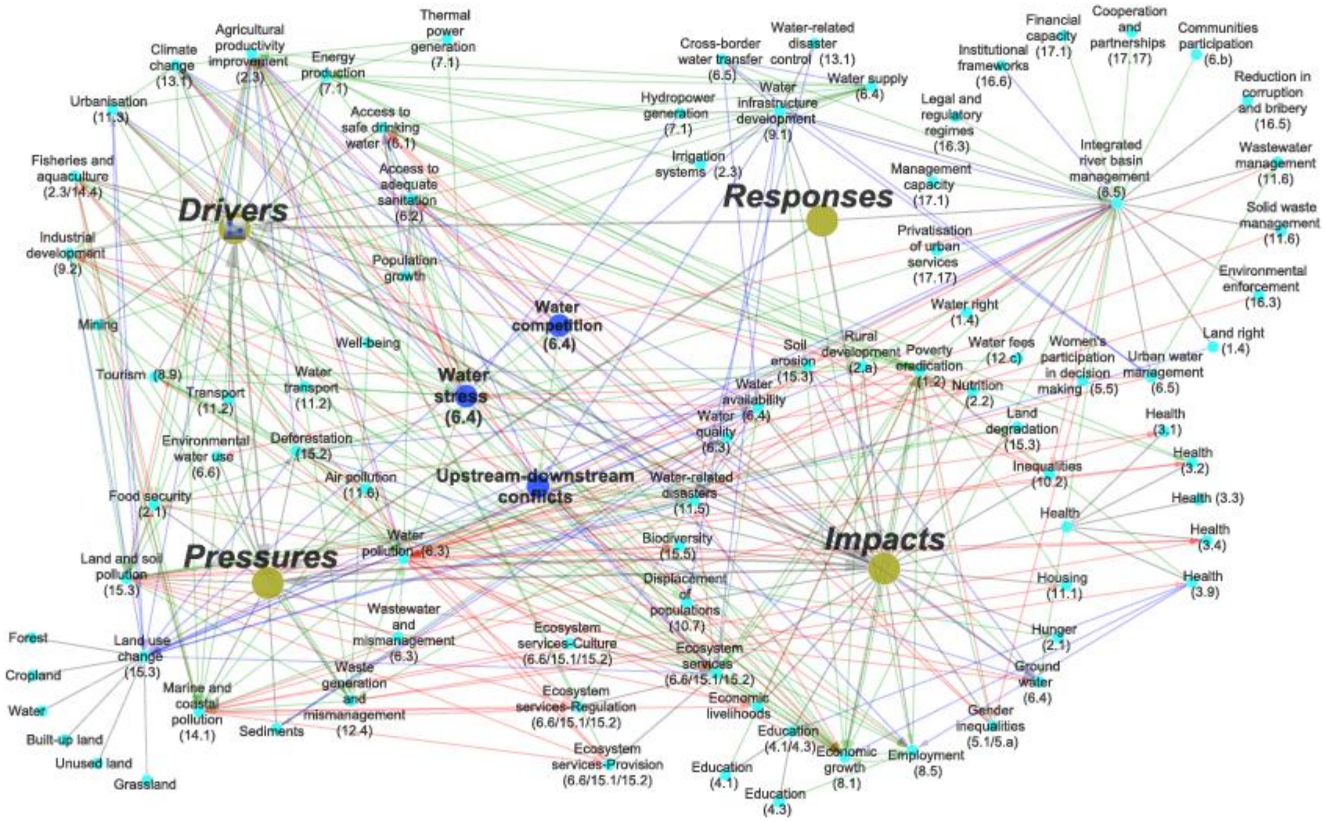

Figure 5: SDG interlinkages model in network graph.

Note: Arrow – indicates the causal relationship between the pair targets; Green links: synergies (positive links); red links: trade-offs (negative links); blue links: either positive or negative based on the conditions and context.

For a river basin, the key drivers to the changes in the hydrological cycle and water resources include climate change (**Target 13.1**) and anthropogenic factors including population growth, economic growth (**Target 8.1**), urbanisation (**Target 11.3**) and increased demand for water from agriculture (**Target 2.3**), industry (**Target 9.2**), energy supply (**Target 7.1**) and domestic sector (related to **Targets 6.1 and 6.2**). These drivers have benefited social and economic development, such as poverty reduction (**Targets 1.1 and 1.2**), job creation (**Targets 8.5 and 8.6**), food security enhancement (**Target 2.1**), hunger and malnutrition elimination (**Target 2.2**) and rural development (**Targets 2.a and 11.a**).

However, they also have influenced the water cycle and placed pressures on the water environment, water resources and associated ecosystems. The pressures and the resulting changes in the state of the environment include: water pollution (**Target 6,3**), deforestation (**Targets 15.1 and 15.2**), and soil erosion and land degradation (**Target 15.3**). These changes further affect the hydrological cycle by changing the quantity and quality of water resources which result in the changes of water availability (**Target 6.4**) and may increase water-related disaster risks (**Target 11.5**). Reduced water availability, together with increased water demand, will intensify water stress which may tense the water competition among users and induce water conflicts between the upstream and the downstream. Furthermore, intensified water stress will impact on the ecological water use and water requirements for maintaining the ecological integrity of the river basin, causing hydrological debt and long-term detriment of human development.

The negative effects on the environment will entail harmful social and economic impacts. These include: adverse impacts on agricultural (**Target 2.3**) and industrial (**Target 9.2**) productivity, economic losses (**Target 8.1**), food insecurity (**Target 2.1**), disproportionate impacts on the poor by depriving access to safe drinking water and sanitation (**Targets 6.1 and 6.2**), impacts on health and well-being (**Targets 3.3, 3.4 and 3.9**), increased malnutrition (**Target 2.2**), enlarged gender (**Targets 5.1 and 5.a**) and other social inequalities (**Target 10.2**). Responses include management approaches, mainly through integrated water resource management (**Target 6.5**), improved governance (**Targets 6.b, 16.3, 16.5, 16.6 and 17.7**), engineering solutions such as development of water-related infrastructure (Target 9.1) and improvement in relevant services (**Target 11.6**). The policy responses, however, may also bring a certain cost to water users and may affect the low-income group disproportionately.

For the LRB, the established SDG interlinkages model was applied to an empirical analysis for three selected cases, namely Fengning Manchu Autonomous County, Chengde County and Luanzhou City (a county level city) which are located in the upper, middle and downstream of the LRB, respectively. All three counties have experienced slowed economic growth (**Target 8.1**), which linked with decreased employment (**Target 8.5**) in the urban areas and increased poverty in the rural areas in Fengning and in both rural and urban areas in Chengde County (**Target 1.2**).

In terms of land-use/cover, cropland and unused land have decreased but built-up land and water-related areas have increased in all three countries. Forest land has decreased in Fengning and Chengde county but increased in Luanzhou City. In contrast, grassland has increased in Fengning and Chengde county but decreased in Luanzhou City. Common drivers for land-use/cover in the three counties include economic development (**Target 8.1**), industrial growth (**Target 9.2**) and rural infrastructure development (**Target 1.a**). Land-use/cover has negatively affected associated ecosystem services (**Target 15.5**), including the provisioning and regulating services in three counties and the cultural services in the upstream (Fengning) and the midstream (Chengde County). In addition, with reduced cropland but increased crop production, this implies intensified agriculture practices which associate with increased fertilizer inputs in the upstream and downstream (**Target 2.4**). This implies intensified pressure on water pollution (**Target 6.3**).

In the midstream Chengde County, increased sown area but decreased agricultural productivity (**Target 2.3**) indicates the practice has become more extensive. This has resulted in less fertiliser inputs (**Target 2.4**). In terms of water quality (**Target 6.3**), the chemical oxygen demand in wastewater discharge has decreased, mainly due to stricter industrial water pollution control (**Target 6.3**) and improved sewage treatment (**Target 11.6**). However, the ammonia nitrogen discharge has increased. Due to less fertiliser inputs, the increase in ammonia nitrogen discharge may have resulted from cage fishing.

In the LRB, the flourishing cage aquaculture in the midstream reservoirs has brought economic benefits (**Target 8.1**) to local populations but also caused serious water pollution (**Target 6.3**), such as suspended solids, oxygen depletion substances, nitrogen and phosphorus. Water quality degradation has influenced the supply of safe water (**Target 6.1**) to downstream areas, including Tianjin Metropolitan. To address this urgent issue, the Central Government issued a ban on cage fishing in Panjiakou reservoir in early 2019 and forced the removal of all cages within a few months. The ban aimed at protecting the water environment (**Target 6.5**) and ensuring access to safe drinking water (**Target 6.1**) in downstream cities; however, it also had a sudden impact on the economic development (**Target 8.1**) and livelihoods of aquaculture farmers in the midstream. This case demonstrated the off-site trade-offs associated with economic development and governmental policies.

Reflections on undertaking analysis at the sub-national scale

Our study demonstrates that local context is very important because environmental, social and political factors vary and co-vary across the catchment. Accordingly, national policies may not necessarily serve the interests at the subnational level and may cause unforeseen trade-offs. Therefore, it is important to recognise that sustainable development trade-offs will need to be considered so that specific needs within, and across regions, can be addressed to ensure that important provisioning services (such as food and water) are maintained. Working with local stakeholders has therefore helped the team to evaluate and validate the usability of project outputs (i.e. policy briefs, maps and guidance) to ensure that they are not only appropriate for adoption by the local stakeholders but also sustainable interventions in the long-term.

The tool we have developed in this project can be used by relevant stakeholders to determine which SDG synergies can be increased and which trade-offs can be minimized thus providing win-win situations across national and subnational scales.

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Project Website https://luanhelivinglab.home.blog/

Related SDG interactive tool: https://sdginterlinkages.iges.jp/luanhe/index.html