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D4.1- Narrative storylines for future vulnerability trends in Monastir

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1 Introduction

This report provides an account of the qualitative vulnerability scenarios. It explains the objectives of these scenarios and the method used for their development. The report presents the resulting scenarios in form of their qualitative storylines.

The objective of the work towards this deliverable has been to develop a set of plausible and consistent qualitative scenarios for the characterization and assessment of possible trends in Monastir's socio-economic vulnerability towards environmental hazards until 2030. These scenarios and their narrative storylines serve two main purposes: Firstly, they provide a tool to reflect on and examine potential trajectories in the city's vulnerability and exposure in order to inform normative policy debates and technical planning processes in regards to desired pathways and the avoidance of non-desired developments. Secondly, they provide a reference frame for the operationalization and quantification of future risk trends in other components of the project, notably the modelling of the city's future scenarios of urban expansion and exposure.

2 Participatory scenario development

The development of qualitative and stakeholder-led scenarios on vulnerability trends in Monastir draws on a method created by UNU-EHS in an earlier Belmont-Forum funded project, called Transformation and Resilience in the Urban Coast (TRUC). This scenario method builds on a number of core principles: First, it features a co-design process in which scientists, policy-makers and risk practitioners jointly contribute to the transdisciplinary co-creation of knowledge. This process is facilitated through exchange during a joint workshop with participation of all the above stakeholders. This workshop was conducted in Monastir on 27 October 2018, with participation of Matthias Garschagen, Michael Hagenlocher, Mostapha Harb (all UNU) and Felicitas Bellert (IABG). Second, the method emphasizes the close relationship between overall socio-economic development trends and vulnerability trajectories. The method therefore inquires major socio-economic development trends which might happen in the future and, from there, teases out the implications for future vulnerability in a city. Third the method follows an inductive approach in which the local stakeholders in the respective city define their priorities in terms of risk dimensions and development considerations to be examined.

The method comprises three key steps. In a first step, major factors shaping vulnerability in Monastir were collected. To facilitate this process, factors identified in the earlier UD-RASP stakeholder workshop, the stakeholder interviews and the online survey were presented as a basis (see Deliverable 3.1). Based on this list, the final list of factors to be considered for the scenarios was refined and clustered into thematic fields. In the second step, the workshop participants debated and defined two axes – or continua – along which to span the scenario space. These axes were thought to represent overarching trends or crossroads in socio-economic or institutional development which bear significance for shaping future directions of the afore-identified risk drivers. A number of potential candidates for these axes were suggested and discussed in this step, from which a pair of two axes were then prioritized to span the two-dimensional scenario space with four scenarios (see Figure 1).

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The limit to two major axes results from earlier experience. Computing scenario combinations of more than two dimensions (or axes) has been shown to prove difficult for the human brain and on-the-spot discussions in a workshop situation. In the third step, the four scenarios were developed by populating the four scenario combinations them with the drivers identified in step 1. For that purpose, each of the drives has to be qualified in accordance with the assumptions of the two overall development axes in the respective scenario space (see Figure 1).

3 Results

Table 1 lists the vulnerability factors considered for the scenarios, structured in factors relating to susceptibility, lack of coping capacity and lack of long-term adaptive capacity.

Table 1: Factors identified and considered in the scenarios

Vulnerability factors		Affected by changes in economy	Affected by changes in law enforcement	Neutral
Susceptibility	Poverty & income (e.g. poverty, unemployment)	X	X	
	Dependency (e.g. age dependency ratio)			X
	Health status (e.g. disability)	X	X	
	Anarchic urban development (e.g. number of informal buildings)	X	X	
	Risk perception (e.g. awareness, perception)	X	X	
Lack of coping capacity	Early warning system (EWS) (e.g. availability of a system, communication)	X	X	
	Accessibility (e.g. evacuation & emergency response)	X	X	
	Building condition (e.g. houses with > 1 floor)	X	X	
	Financial capital (e.g. savings, access to credits)	X	X	
	Insurance (e.g. flood insurance)	X	X	
	Contingency funds (e.g. funds for emergency response)	X	X	
	Social capital (e.g. social networks)			X
	Government assistance (e.g. social protection)	X	X	
Lack of adaptive capacity	Education (e.g. post-secondary education)	X	X	
	House ownership (e.g. renters/owners)	X	X	
	Plans & strategies (e.g. disaster risk management, etc.)		X	

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In terms of the axes to span the scenario space (step 2 of the method), the workshop participants identified the following two continua as most relevant for describing overall development crossroads for the city of Monastir and the shaping of future vulnerability of its population towards environmental hazards:

1. **Strong vs. weak economic development**
2. **Strong vs. weak law enforcement**

Resulting from these two axis is the scenario space with four scenarios indicated in Figure 1:

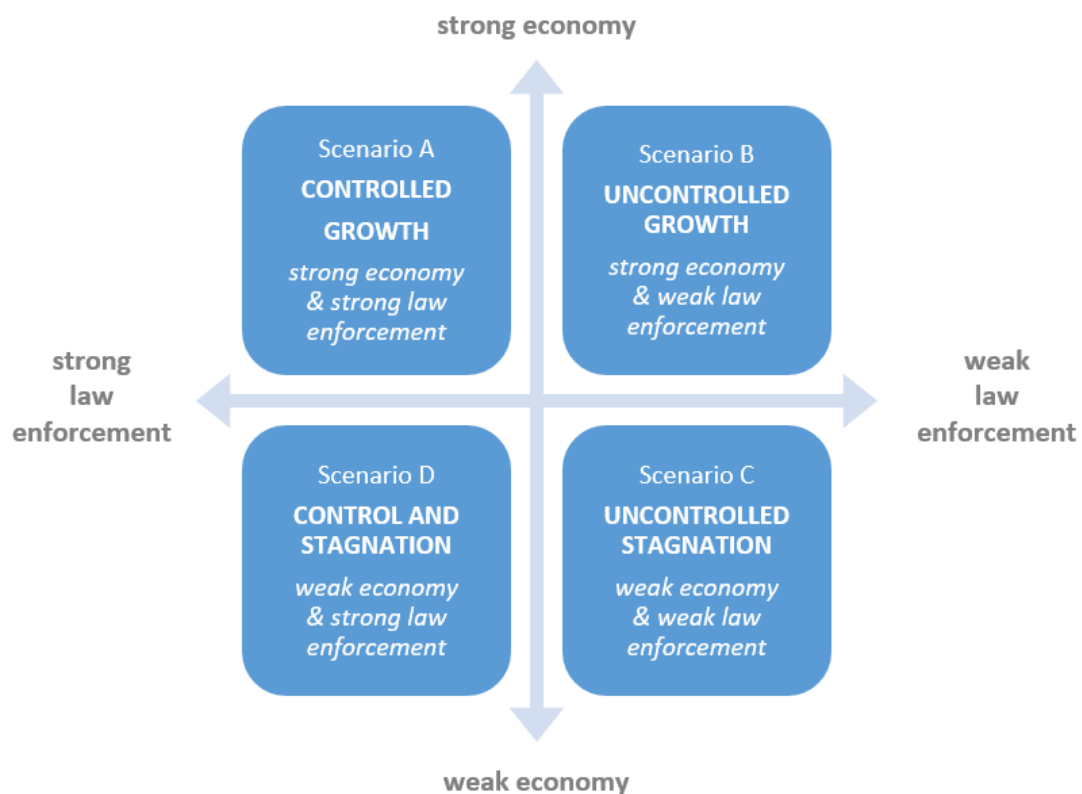


Figure 1: Four scenarios along two major axes (defined during the first scenario workshop)

Populating these four scenarios with the vulnerability factors of step 1 results in the following **four storylines** with implications in terms of social vulnerability scenarios for Monastir:

1. Controlled growth
2. Uncontrolled growth
3. Uncontrolled stagnation
4. Control and stagnation

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3.1 Controlled growth (Scenario A)

In this scenarios, the city experiences sound economic growth and strong law enforcement until 2030, which leads to comparatively favorable conditions for the reduction of social vulnerability. Economic growth in the city is driven by both a stabilization of the national economy and, at sub-national level, favorable regional economic developments in the Monastir region. The number of in-bound tourists recovers to levels seen last before the Arab spring, and expands even beyond these levels during the second half of the 2020s. Considerable growth also happens in the building sector as well as other industries and the service sector within the boundaries of the *Plan d'Amangement (PAU)*. Monastir expands its position as key regional hub for trade, industry and services (incl. tourism). Perceived security and institutional stability as well as reliability resulting from strong law enforcement are major factors contributing to this trend. The overall economic growth percolates to all layers of Monastir's society. It allows for the reduction in unemployment and poverty, and the rise in real income across all income groups. One of the most immediate effects at the household level is an increased spending on health-related assets and services, leading to a successive improvement of overall health conditions. Growing private spending is also directed towards the improvement of the existing building stock and development of new housing. Yet, strong law enforcement avoids uncontrolled and illegal sprawl of the city into areas with high future hazard exposure.

The continued growth of the economy and tax base at national and local level increasingly allows for the consolidation of government budgets. Strong government and law enforcement further contributes to the reinvestment of funds into long-term projects from the late 2020s onwards. These include most notably an improvement of the public systems for education, health care and social protection as well as other public infrastructure. The budget consolidation successively also allows for the investment into specific risk reduction measures, such as the development of an early warning systems and the enlargement of contingency funds and training for crises prevention and response. Major effects of all these investments will only materialize after 2030. Yet the initiation of these policies during the 2020s coupled with and the increased trusts in their continued implementation due to the strengthened law-enforcement creates positive feedbacks. This is because the strengthened trust in strong institutions opens an expectation of a positive future, therewith triggering further investments by households and the private sector. Amongst them, private insurance providers increasingly offer products against damage from environmental hazards. At the same time, the risen income levels allow a growing number of Monastir's residents to purchase such insurance.

Overall, this scenario is likely to lead to **positive effects in terms of vulnerability reduction**:

- A **reduction of exposure** by reducing the number of illegally built houses in Monastir located in hazard-prone areas and through investments in public infrastructure (such as drainage systems),
- A **reduction of susceptibility** through direct impacts on poverty levels, unemployment, and the amount of informal buildings, while also increasing the feeling of security and trust in institutions. Investments in public systems might also contribute to increased health conditions, further reducing susceptibility,
- An **increase in coping capacities (of both households and institutions)** through increased savings, better access to credits and loans, investments in disaster risk management (e.g. availability of equipment, training of staff, etc.) and government assistance/social protection

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programs, as well as by enabling additional households to buy insurance premiums for risk transfer,

- An **increase in adaptive capacities** through potential positive effects on education levels and by increasing the number of households who can afford to buy a home (instead of renting) which enables them to take preventive action, such as better protecting their home against hazards (such as flash flooding).

3.2 Uncontrolled growth (Scenario B)

In this scenario, the city sees favourable conditions for economic growth whilst the plan to improve law enforcement fails to be implemented or effective. Together, these developments provide a mixed prospects for vulnerability reduction. Beneficiaries of the economic growth can drive forward their vulnerability reduction in some respects whilst the lack of law enforcement invites the increase of vulnerability in other areas and hampers a strategic public approach to its reduction. Economic growth is driven by short-term opportunities, most importantly a revived boom in the tourism sector. This boom emerges from difficulties in other global tourist destinations, notably due to security concerns and the rising costs of long-haul charter tourism (e.g. Turkey and Southeast Asia respectively), hence turning Tunisia into an attractive alternative for the European market. However, not all parts of Monastir's society benefit from this economic growth and participate in the successive rise in incomes. Weak law enforcement also means that only limited energy is invested on the implementation and further refinement of redistribution policies. This combination of trends leads to growing income disparity and a widening gap in the capacity to reduce vulnerabilities towards environmental hazards. At the same time, the lack of law enforcement in combination with continued in-migration from rural areas and the persistence of poor and marginalized strata in the city's population leads to uncontrolled sprawl of low-income housing, much of it illegal or informal, into urban wastelands with potentially high hazard exposure.

In the absence of reliable law enforcement, strong government, effective tax collection and insufficient public spending, the gains from economic growth do not lead to a reinvestment of potential gains into the public infrastructure for health care, education, social protection and the like. Also, targeted risk reduction measures such as early warning systems or contingency planning and funding remain truncated due to the lack of public spending and strong government. Long-term planning to that end is lacking. In terms of insurance coverage a much divided picture emerges: Whilst rich and better-off households can afford to purchase hazard insurance for their house and property, the large proportion of poor and marginalized lack the means for private insurance. In the absence of a strong government, subsidized insurance schemes are not available. Low trust in the reliability of institutions also means that the insurance sector is reluctant to aggressively expand.

Overall, this scenario is likely to lead to **differential effects in terms of societal vulnerability**, notably:

- A potential **increase in exposure in some parts of the city** through accelerated in-migration from rural areas, resulting in the growth of illegal or informal settlements outside of the confined boundaries of the PAU. A potential **decrease of exposure in other parts of the city** (notably those where political interests are high) through investments in drainage systems.

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- A **reduction of susceptibility in some parts of the city** through direct impacts on poverty levels and unemployment, while **susceptibility might remain high or even increase in the informal parts of the city** – further fuelled by expected growth of income disparities.
- **No major changes or even a decrease in coping and adaptive capacities (of both households and institutions)** due to the lack of reinvestment of potential gains into the public infrastructure for health care, education, social protection and disaster risk management (prevention, preparedness and response capacities)

3.3 Uncontrolled stagnation (Scenario C)

In this scenario, the city experiences weak economic development, coupled with weak law enforcement. This combination results in very unfavourable conditions for vulnerability reduction. Political instability and government ineffectiveness continue to hamper the potential for endogenous economic growth. Extern growth stimuli are also lacking due to a stagnation in the world economy and a continued bust of inbound tourism to Tunisia and Monastir. As a result, income levels stagnate or even decline across all levels of Monastir's population. Unemployment is growing and public (incl. touristic) infrastructure is not properly maintained due to the lack of private resources and public support for maintenance further decreasing the attractiveness of Monastir as a destination for international tourists. Household spending is in decline, especially into areas such as health care, resulting in stagnating or even deteriorating health conditions of the city's population. Further, illegal housing developments with sub-standard quality can be observed in urban wastelands with potentially high hazard exposure.

Public spending for education, health care and other infrastructure is in decline, thereby cementing a long-term downwards pathway and limiting the opportunities for building adaptive capacity in the future. The government also lacks funds as well as will and rigor to engage in targeted risk reduction and adaptation measures. Early warning systems for environmental hazards are therefore not built and maintained. Likewise, no considerable investment is made into the design and implementation of contingency planning, training and management, neither into public awareness raising campaigns. Insurance solutions against the growing threat of environmental hazards are not affordable to the great majority of citizens and re-insurers might be deterred by the lack of law enforcement. Neither are government-subsidized insurances available.

Overall, this scenario is likely to lead to **an increase of societal vulnerability**, notably:

- An **increase in exposure** through continued in-migration from rural areas and the growth of illegal or informal settlements outside of the confined boundaries of the PAU, combined with the lack of investments in public infrastructure such as drainage systems.
- An **increase in susceptibility** through direct negative impacts on poverty levels, unemployment, and informal settlements, while public spending cuts lead to a further **decrease in coping and adaptive capacities (of both households and institutions)**.

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3.4 Control and stagnation (Scenario D)

In this scenario, strong law enforcement is achieved at national and city level whilst other economic conditions remain poor, resulting in a weak economy. This provides a mixed picture for the prospects of vulnerability reduction. Strong law enforcement helps to build trust in the government. Yet this institutional security alone cannot sufficiently lift the economy as the external economic situation in terms of the world economy and the overall situation in the Maghreb and Tunisia remains bleak. However, the growing trust in the government and in law enforcement provides a basis for the economy to pick-up quickly as soon as the external situation clears up. As this does not happen until the late 2020s, however, the economy in Monastir remains in a bust, especially its tourism sector. As a result, household income is in decline across all strata of Monastir's population. Private spending on health care is sliding, leading to stagnation or even a steady decline in overall health conditions. Similarly, private investment into the maintenance of the housing stock is in decline.

The government tries to keep-up public spending as a much as possible but runs out of reserves towards the second half of the 2020s. As a result, public infrastructure for education, health care and other services starts to degrade. Further, spending on social protection stagnates and is prioritized to only the most vulnerable parts of society. However, the government still manages effectively to maintain low-cost risk reduction measures such as contingency planning amongst the different of the city administration and public awareness campaigns (e.g. drills) of the existing police and fire-fighter forces. The city government also manages to prevent the sprawl of informal and illegal settlements into potentially hazard prone non-urban lands. The trust in institutions also means that private insurance providers are in principle ready to supply insurance products. The decline in private spending, however, means that only a very small part of Monastir's population has resources available to purchase insurance against loss and damage from environmental hazards. The government also does not have the budget to engage in a long-term cross-subsidization of insurance solutions.

Overall, this scenario is likely to lead to **differential effects in terms of societal vulnerability reduction**, both **within the city** as well as **over time**, notably:

- A **stagnation in exposure** through reduced in-migration from rural areas and reduced sprawl of informal and illegal settlements into potentially hazard prone areas. Exposure patterns, however, might also change with changing climatic conditions which is not taken into account in this scenario.
- An **increase of susceptibility, coping and adaptive capacities over the next years** through direct impacts of economic stagnation on poverty levels, unemployment and public investment, with the **potential that economic growth – and positive impacts in terms of vulnerability reduction – might be boosted by the strong law enforcement in the long-term.**

4 Conclusions

This report provides an account of the qualitative vulnerability scenarios until the year 2030 which were co-designed and developed during a dedicated scenario workshop in close collaboration with relevant local actors. The here presented narrative storylines can be used as an input for the development of spatial vulnerability scenarios.