

## Planned relocation from Danube floodplains in Austria

Lessons learned from five decades of policy practice

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Figure 1: Impressions from a Danube floodplain. © Seebauer, Babicky, Kirchberger.

### INTRODUCTION

This paper discusses the procedures installed over time for planned relocation along the Danube River in Austria and lessons learned from the varying success these procedures had. The aim of the paper is twofold. First, we describe the government approach on planned relocation; that is, how the relocation programs were formally set up and implemented. Second, we examine and discuss modes of governance and household choices, which contributed to the success (or failure) of relocation schemes in Austria. Policy handbooks published by the World Bank and others<sup>1</sup> emphasize that the success of relocation programs does not just depend on the terms of home buyout payments, but that accompanying factors like risk governance, personal resources and community dynamics play an equally important role. Here, we identify lessons learned from Austrian policy implementation and how to leverage these accompanying factors for effective and fair implementation.

We draw on a mixed-method approach to reconstruct how relocation planning, decision and implementation unfolded in the 1990-2020 decades, also looking back to the predecessor of the current scheme in the 1970s/80s. The applied methods portfolio comprises semi-structured qualitative interviews with decision-makers in national, regional and local authorities; archival research of policy documents (e.g. cabinet papers, press releases, legal texts), historical maps, staff reports from national and regional authorities (e.g. water engineering and agricultural departments) and notification letters to residents; and longitudinal semi-structured qualitative interviews with former and current residents in the respective relocation areas. For methodological details and theoretical background, please refer to our articles underlying this paper.<sup>2</sup>

<sup>1</sup> Correa, E., Cortes, F.R., Sanahuja, H., Populations at Risk of Disaster: A Resettlement Guide, 2011, World Bank, Washington, D.C; UNHCR Planned Relocation, disasters and climate change: Consolidating good practices and preparing for the future, 2014, <http://www.unhcr.org/54082cc69.pdf>; Cernea, M., The risks and reconstruction model for resettling displaced populations, 1997, World Development 25 (10), pp. 1569–1587, DOI: 10.1016/S0305-750X(97)00054-5.

<sup>2</sup> Thaler, T., Seebauer, S., Schindelegger, A., Patience, Persistence and pre-signals: Policy dynamics of planned relocation in Austria, 2020, Global Environmental Change 63, DOI: 10.1016/j.gloenvcha.2020.102122.

## CASE STUDY DESCRIPTION

The Danube River crosses the federal republic Austria in its upper catchment draining a large part of the Northern Alps. The river has carved its way through old crystalline bedrock forming gorges and river basins. River regulation from the mid-19<sup>th</sup> century onwards and vast urban development along the riverbanks contributed to a drastic change in the water regime and flood dynamics. Especially the large river basins determined by agricultural use are prone to frequent and severe flooding. In the recent past large floods occurred in 1991, 2002 and 2013<sup>3</sup> causing extensive damage, economic loss and short-term displacement of affected households. For decades flood protection measures were implemented along the Danube River relying in the first place on structural measures also due to numerous valuable historical settlements along the river banks.

Relocation as a measure of managing flood risk entered the scene in the 1970s by chance. Lightning struck a farmhouse in the southern Machland basin and caused a fire which destroyed the building. The mayor of the municipality – in charge of executing building regulations – refused to allow the reconstruction. Instead, he tried to raise money to enable a relocation of the frequently flood affected farm and succeeded. This was the starting signal for planned relocation along the Danube River, yet without a comprehensive framework. As only solitary farmhouses were located in the southern Machland basin, agricultural funds were deployed for all objects in areas located barely above the river water level. For approximately a decade, the offer to receive compensation for a voluntary relocation existed for these farmers, leaving them with the choice to stay or leave. The deconstruction work was mostly done by the farmers themselves and they reused window frames, roof trusses, wooden floors, etc. when they rebuilt farmhouses in flood-safe locations. The deconstruction sometimes took several years, and in some cases, the abandoned houses were even raided. In the end, about 40 farms were relocated.<sup>4</sup>

Based on the experiences of this first wave of relocation the overall discussions whether to continue relocations for flood protection regained momentum after the 1991 flood event at the Danube River in the Machland and later in the Eferding basin (see Figure 2). Over the years a relocation framework, strongly based on governance arrangements<sup>5</sup>, was developed to ensure on the one hand the efficient use of public money and on the other hand to guarantee the identified households a transparent and fair offer.

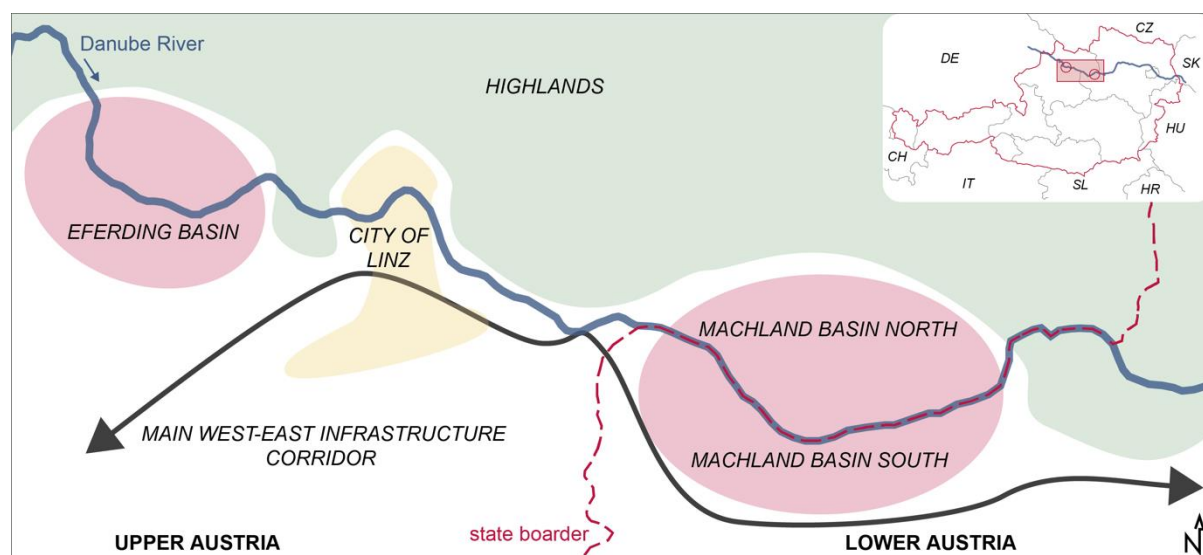


Figure 2: Location of Machland and Eferding basin along the Danube River (adapted from Thaler et al., 2020).

<sup>3</sup> Information about Danube River floods from ICPDR: <https://www.icpdr.org/main/issues/floods>.

<sup>4</sup> Schindelegger, A., Relocation as a planning instrument: Managed retreat for natural hazard prevention from a planning perspective, 2019, PhD thesis. Technical University of Vienna, Vienna.

<sup>5</sup> Schindelegger, A., Relocation for Flood Retention in Austria, in: Opportunities and Constraints of Land Management in Local and Regional Development, Hepperle, E., Paulsson, J., Maliene, V., Mansberger, R., Lisec, A., Guelton, S. (Eds.), 2018, vdf Hochschulverlag, Zürich, pp. 111-120.

The developed scheme (see Figure 3) includes the national, regional and local of government in administering and financing it. Households that decide to relocate will receive an instalment-based compensation payment. This ensures that it is financially possible to actually move somewhere else and pay for the deconstruction of buildings. The scheme compensates 80 % of the fair value as well as 80 % of estimated costs for deconstruction. The plots remain with their owners who have to declare a waiver concerning any further construction activity. The 80 % rule is based on the principle of sharing costs for flood protection. The federal state accounts for 50 %, the state for 30 % and the beneficiary for 20 % of the estimated costs. As affected households are considered beneficiaries of the scheme, they have to carry a share of the relocation costs.

The developed relocation program along the Danube River is based on sharing responsibilities in administration. The state administration manages the overall process, identifies the households for relocation and commissions expert opinions on the fair value if requested. The fair value assessment is checked by the Ministry of Finance to ensure its accuracy. All relevant planning decisions and the execution of the building law lie with the municipalities. They have to enact building bans in relocation areas, re-zone building land if necessary and issue the permits for deconstruction. Due to the different administrative actors usually a coordinating board, consisting of political representatives and experts, is established to ensure good coordination. The affected households can decide voluntarily, if they would like to relocate and have to sign a contract to receive the compensation payment. However, the relocation scheme does not necessarily offer any psychological support or help with the search for a new place to settle unless municipalities take over a responsibility for it.<sup>6</sup>

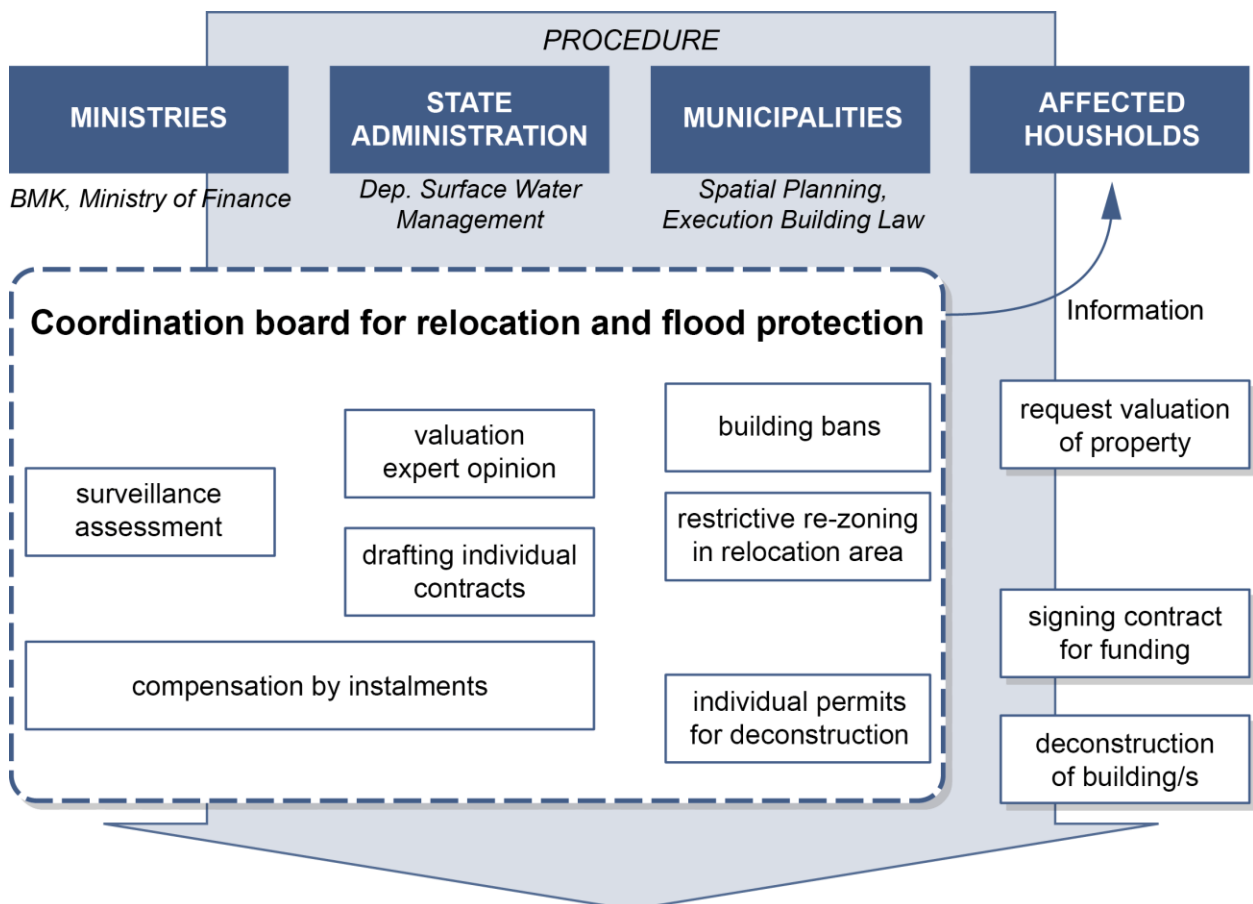


Figure 3: Formal scheme for planned relocation in Austria, adapted from Schindelegger, 2018.<sup>7</sup>

<sup>6</sup> Ibid.

<sup>7</sup> Schindelegger, A., 2018.

Overall, around 500 households along the Danube River have been relocated over the past 50 years. This implies that the developed scheme has been successful in terms of flood risk reduction. Nevertheless, conducting such interventions challenges governance arrangements and has wide-ranging implications for affected households we explore in the following sections.

## MODES OF GOVERNANCE

Governance plays a crucial role in the design, management and implementation of planned relocation as a response to flood hazards. The Austrian flood risk management is characterized by a range of conflicting regulations, funding schemes and policy directions.<sup>8</sup> Main reasons are different objectives in flood risk management (prevention, emergency response, recovery), but also the federal system of the republic. Therefore, some responsibilities lie with the federal state, others with the single states; the local level has a strong executive role.<sup>9</sup> As a consequence, there is a large number of different actors and stakeholders involved in Austria's flood risk management with different legal foundations, interests and objectives.<sup>10</sup>

The instrument of planned relocation developed in a similar process over the past years. Since the 1970s, several planned relocation projects have been conducted along the Danube River. It is possible to distinguish between three phases: the first phase includes relocation in the 1970s/1980s in the southern Machland basin (Machland South in the state of Lower Austria); the second phase covers the years between 1991 and mid-2010s with a focus on the northern Machland basin (Machland North in the state of Upper Austria); and finally, the third phase including planned relocation projects since the 2013 flood (esp. Eferdinger basin in the state of Upper Austria). This evolutionary process included a change in regulations, in terms of compensation as well as involved actors and responsibilities (see table 1).<sup>11</sup>

The first phase (1970s to 1980s) was based on a strong local bottom-up engagement. The relocation process in Machland South had some legal and policy guidance, but it provided a wide range of flexibility in terms of implementation but also with unintended results, such as abandoned buildings left to decay. Main actors were the local mayors of the affected municipalities as well as the state of Lower Austria providing the funds. The policy and legal framework evolved with the second large scale planned relocation in Machland North and the continuation in Machland South.

Machland North (1991 to mid-2010s) was mainly organized, planned and implemented by national and regional authorities. The national authority (the Federal Ministry for Transport, Innovation and Technology, BMVIT<sup>12</sup>) was pushing for a consistent framework for the relocation process and provided up to 50% of the estimated costs of relocation. Secondly, the regional authority was a key player in the implementation process, in terms of communication and negotiation with the private landowners. Thirdly, the local authorities (in contrast to Machland South) were in charge of planning decisions (building bans, re-zoning), execution of building regulations and if possible, for supporting the search for alternative building plots for the relocating households.

The current third relocation phase includes a shift in the responsibility for coordination and leadership towards the regional authority. The regional authority takes over the responsibility in planning and managing the overall process of planned relocation including the public communication. The federal administration now only has a supervisory function and provides funds. In contrast, the role of local authorities has not changed.<sup>13</sup>

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<sup>8</sup> Rauter, M., Schindelegger, A., Fuchs, S., Thaler, T., Deconstructing the legal framework for flood protection in Austria: individual and state responsibilities from a planning perspective, 2019, Water International. DOI: 10.1080/02508060.2019.1627641.

<sup>9</sup> Thaler, T., Priest, S.J., Fuchs, S., Evolving inter-regional co-operation in flood risk management: distances and types of partnership approaches in Austria, 2016, Regional Environmental Change 16, pp. 841-853, DOI: 10.1007/s10113-015-0796-z; Schindelegger, 2019.

<sup>10</sup> Rauter et al., 2019.

<sup>11</sup> Thaler et al., 2020.

<sup>12</sup> In course of the last government formation the Ministry was renamed in 2020 and has now the acronym BMK, <https://www.bmk.gv.at/en.html> but is still in charge of flood protection along the Danube River.

<sup>13</sup> Thaler et al., 2020.

So, what were the main adjustments between the three phases? First of all, planned relocation included additional legal regulations (financing within the scheme of flood protection projects). Secondly, over time there have been changes within the administrative practice (guidelines for the administrative process to ensure a consistent framework) and the number of actors involved. Over the years, there has been the inclusion of additional administrative actors (such as the Ministry of Finance who is now responsible for monitoring the property valuation). Consequently, planned relocation has become less flexible in the overall process while improving the procedural consistency. Especially representatives of national authorities acted as policy entrepreneurs to advocate planned relocation and direct the discourse; in contrast, local stakeholders and residents played a mostly passive role.<sup>14</sup>

CASE SITES	MAIN ACTORS	MAIN TASKS
Machland South, State of Lower Austria (1970s/80s)	Local authorities	Organization of the overall planned relocation process
	State level (Department for Rural and Agricultural Development)	Providing the funds for compensation
Machland North, State of Upper Austria (as of 2002)	National level (Federal Ministry for Transport, Innovation and Technology, Ministry of Finance)	Organization of the overall planned relocation process as well as providing major share of the necessary funds.
	State level (Regional government secretaries, Department for Surface Water Management)	Negotiation with private landowners and contribution to the compensation payments.
	Local authorities	Provision of alternative building plots and main point of contact for general concerns and questions of affected households.
Eferdinger basin, State of Upper Austria (as of 2013)	National level (Federal Ministry for Transport, Innovation, Technology and Ministry of Finance)	Provision of financial funds and supervision of valuation of the concerned buildings. Administrative role only.
	State level (Regional government secretaries, Department for Surface Water Management)	Overall organization of relocation process. Main point of contact for information and in control of the public communication. Provision of financial funds and negotiations with households.
	Local authorities	Provision of alternative building plots. Obligated to execute the instructions from the regional level once they decide to support the relocations.

Table 1: Key actors within the Austrian planned relocation framework for three case study sites in the three phases.

<sup>14</sup> Ibid.



## PRE-SIGNALS AND TIMING

The implementation of planned relocation is mainly defined by the aspect of pre-signals and question of timing. Usually, extreme flood events, such as the latest Danube floods in 2002 and 2013, can be seen as a trigger moment in the decision-making process to promote planned relocation. The flood events represent as a window of opportunity at the national and regional policy level. However, an extreme flood event does not necessarily translate into successful implementation. Planned relocation can be successful if the scheme is initiated directly after a recent flood event before reconstruction starts. This window is leveraged best in communities with a risk management discourse preceding the flood event, since they may move directly from strategy to action. This applies to the Machland North case. The planned relocation scheme had already been discussed since 1991 (after the 1991 Danube flood event) for more than a decade until the flood event in 2002 triggered the actual large-scale implementation of relocation. The exposure as well as the negotiated policy framework were well known among the affected households.<sup>15</sup>

A different development could be witnessed in the Eferdinger basin in 2013. Here, a pre-prepared plan for a comprehensive flood protection scheme, combining relocation and technical measures, already existed before the flood event in 2013. The pre-prepared plan was on the basis of technical expertise, which disclosed the Eferdinger basin as the last large-scale planned relocation site within the country. The plans were swiftly put in practice by regional authorities while local authorities and residents were still overwhelmed by the 2013 flood event and coping with the impacts. Consequently, residents and decision-makers (at local level) opposed the planned relocation. Main reasons were: (1) affected householders already started to apply for funds from the disaster relief fund and started to repair their building and (2) mayors expected the implementation of a flood protection scheme based on dams and levees instead of planned relocation. Consequently, the Eferdinger basin missed the pre-signals in comparison to the Machland North case.



Figure 4: From deconstruction to rebuilding – examples from the Eferdinger basin in the years 2015-2018, © Seebauer, Babicky.

<sup>15</sup> Ibid.

## HOUSEHOLD CHOICES AND REACTIONS

### Decision to stay or leave

In the Austrian planned relocation for flood prone areas, the individual decision to stay or leave does not hinge on economic considerations alone.<sup>16</sup> Relocating residents struggle with multiple impacts, such as: overcoming emotional attachment to the previous residence; coping with financial burdens and dealing with recurrent traumatic memories of the flood event. These impacts often exceed the economic costs and benefits and contributes pivotal weight in private decisions. Age appears as an important background variable, as life stage and physical frailty play into economic considerations and a lifelong personal bond to the area manifests as a strong feeling of belonging.<sup>17</sup>

In the initial stage of the decision process, buyout sum, income and savings are compared to the costs of a new home.<sup>18</sup> However, if relocation seems financially feasible, more important factors come to the fore: fear of the next flood event and place identity are strong emotional drivers; risk appraisal is coloured by personal experiences and mental strategies for dealing with uncertainty and taking the step to stay or leave is governed by efficacy beliefs about flood preparedness or building construction, respectively.

### Temporal aspects in deciding to stay or leave

Whether residents accept the compensation payments and relocate depends crucially on social learning (observing others successfully concluding their move) and on coincidence with personal circumstances and biographical stages (absence of other personal crises, empty nest after children move out).<sup>19</sup> This highlights the critical issue of the relocation timeframe. Keeping the relocation policy window open for a long time makes it more likely that the offer coincides with a household situation that favours relocation. In the Eferding basin program, residents had to commit to relocation within just five years. However, few households entered appropriate circumstances within this short timeframe, which may have contributed to lower acceptance compared to the decades-long policy window in the Machland schemes.

Those who postpone the decision to stay or leave experience feelings of being left behind on their own, as their surroundings depopulate, neighbourhood support diminishes and communal infrastructure is gradually reduced (e.g., by reducing the frequency of service at bus stops or garbage collection sites).<sup>20</sup> Eventually, this encourages them to abandon the area at risk too as soon as their personal circumstances or life stage suggest a change of their residential situation.

### Coping with staying or leaving

The majority of residents who accepted the relocation offer eventually returned to previous levels of personal wellbeing within five years.<sup>21</sup> These coping outcomes refer to the case of a voluntary relocation program providing substantial compensation payments; therefore, the results should be transferred to other cases of compulsory, unplanned, or non-compensated resettlement with caution. The relocation stressor plays a minor role for overall quality of life and wellbeing compared with family, job, health, and partnership, unless the relocation coincides with a personal crisis (e.g., divorce, loss of a close relative, chronic illness) that already overstretches coping capacities.

Main coping strategies employed by residents in order to mentally deal with the personal upheaval of relocation are cognitive restructuring, opposition, problem solving, rumination and escape/avoidance.<sup>22</sup> Coping strategies depend on the life circumstances; for example, people who had moved to the relocation

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<sup>16</sup> Seebauer, S., Winkler, C., Should I stay or should I go? Factors in household decisions for or against relocation from a flood risk area, 2020a, *Global Environmental Change*, 60, pp. 1-14, DOI: 10.1016/j.gloenvcha.2019.102018.

<sup>17</sup> Thaler et al., 2020.

<sup>18</sup> Seebauer & Winkler, 2020a.

<sup>19</sup> Thaler et al., 2020.

<sup>20</sup> Ibid.

<sup>21</sup> Seebauer, S., Winkler, C., Coping strategies and trajectories of life satisfaction among households in a voluntary planned program of relocation from a flood risk area, 2020b, *Climatic Change*, 162(4), pp. 2219-2239, DOI: 10.1007/s10584-020-02796-1.

<sup>22</sup> Ibid.

areas shortly before the flood event and who decide to leave cognitively restructure the relocation as a means of taking back control after being a flood victim, or on the contrary families who live in the region for generations and who opt to stay most likely will ruminate about a gradual decline in neighbourhood structures. Coping strategies also depend on the relocation phase; for example, rumination is integral to the initial phases of coping but dissipates once residents settle into their new environment.

Many households report critical turning points in their personal coping process that mark phase transitions in the relocation process.<sup>23</sup> After making the binding decision for or against relocation, households feel relieved and start pursuing optimistic and self-determined perspectives for their future. When implementing the planning and construction steps for their new home, wellbeing tends to decline. In particular, households experience the demolition of their own or their neighbours' old houses very emotionally, as it symbolizes the irretrievable abandonment of the old life situation. For households that leave, the moment of moving their belongings to the new dwelling indicates a new start in their lives.

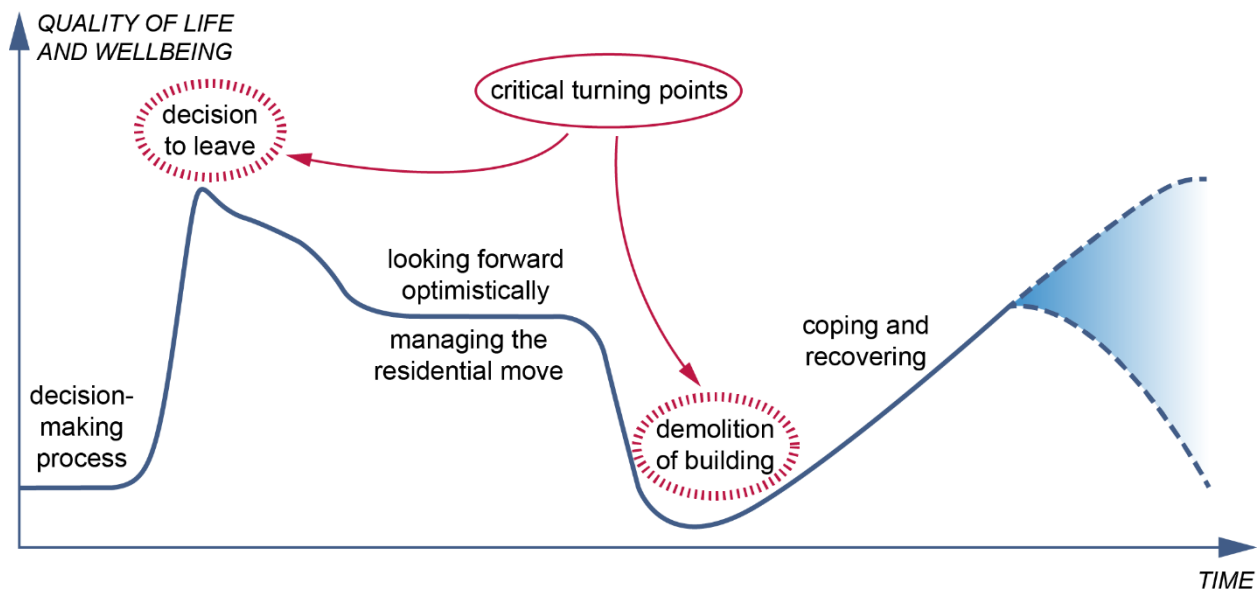


Figure 5: Prototypical coping process of those who leave, adapted from Seebauer et al., 2018<sup>24</sup>

## POLICY RECOMMENDATIONS

### Recommendations for support of affected households and residents

Encouraging the formation of early and structured planning could promote constructive problem-solving,<sup>25</sup> however, overly optimistic plans should be avoided, as the frustration when these ambitions fall short of the real options may delay recovery among households who leave. Personal planning should sketch out and schedule the incremental steps to take (bringing to mind personal circumstances, setting personal goals, comparing offers, etc.); residents could be encouraged to develop an annotated timeline explaining the stages of their personal relocation process.

Opposition, protest and denial are legitimate coping strategies for venting and emotionally distancing oneself temporarily from the burden of the relocation program. Relocation program managers could meet residents' opposition by engaging with the community in a transparent and inclusive manner. Giving citizens a voice in program design would also prevent continued fruitless opposition, which holds the risk of a delayed recovery process among households who stay and who cannot let go of perceptions of injustice.

<sup>23</sup> Ibid.

<sup>24</sup> Seebauer, S., Winkler, C., Thaler, T., Babicky, P., Negotiating planned flood relocations: A longitudinal case study on the Eferding Basin, Austria, 2018, presentation at the 25th International Association of People-Environment Studies Conference, July 8-13, 2018, Rome.

<sup>25</sup> Ibid.



Program managers could present role model households which successfully concluded the relocation process.<sup>26</sup> These may be households from the same region, or from a similar/neighbouring region that already completed a relocation program at an earlier time. A handful of early relocators may demonstrate to those who are undecided that establishing a new or even better livelihood is feasible within the current property market constraints.

A central contact point could offer personal counselling, compile information on legal and financial procedures, facilitate access to construction companies and tradespeople, assist in resolving intergenerational or bureaucratic conflicts, coordinate households with similar interests, and act as a mouthpiece between residents and political actors.<sup>27</sup> This contact point should be allocated in and maintained by the institutions responsible for the relocation program in order to have unrestrained access to process information and governance actors. This contact point should have a clear and transparent mandate whether they aim to convince residents to leave, or whether they aim to support households in making their choices, no matter the outcome.

Recurrent rumination on the lost old home, particularly affects long-term residents who leave and retain a strong sense of belonging to their former place of living. Symbolic actions, such as erecting a memorial stone or reusing roof beams and foundation stones of the old home in the construction of the new home, might help these households to integrate their memories in their new place of living. Moreover, reusing constructional parts from the old home may alleviate the construction costs for the new home.

Finally, program managers can be advised not to forget those who stay: in a voluntary scheme, some residents decide to leave, whereas others stay. Those who stay, justify special support, as they face unmitigated risk and possibly less governmental willingness to provide flood protection or emergency help.

### Recommendations for governance arrangements

Overall, the role of pre-signals is important: repeated flood events gradually advanced planned relocation on the political agenda. However, an extreme flood event does not by itself ensure a successful implementation. There is a need for extensive engagement with the community already before floods occur. Consequently, planned relocation needs a long-term perspective of introducing the scheme to a community and familiarising it with the relocation specifics, benefits and drawbacks. Planned relocation needs time to be processed for policy makers and residents. A clear point is that planned relocation should not be seen within a technical project-based approach (e.g., financial compensation only available for a very short time period). The population in relocation areas is typically heterogeneous; relocation programs need to address the different needs and capacities of individuals/households. For example, in Austrian rural riverside settlements, there is a divided structure of traditional farmhouses inhabited by long-established families versus recently erected detached houses inhabited by newcomers.

Financial incentives act as door opener and pull-strategy. However, economic reasons are not solely assessed with regards to personal welfare, but judged in the light of the children's future prospects. Finally, the decision on who should be given the possibility to move should not be based exclusively on a cost-benefit analysis from a structural protection perspective. Such an analysis should account for the scope of household reactions including multiple psychosocial, intangible, and non-monetary impacts.

## ACKNOWLEDGEMENTS

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<sup>26</sup> Thaler et al., 2020.

<sup>27</sup> Seebauer & Winkler, 2020a.

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