

THESES OF THE DOCTORAL (PhD) DISSERTATION

EXAMINATION OF DEVELOPING OPPORTUNITIES OF “*POST-DISASTER-RECOVERY EVALUATION SYSTEM*” AFTER NATURAL DISASTERS

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1. THE BACKGROUND AND OBJECTIVES OF THE RESEARCH, INTRODUCTION OF HYPOTHESES

I started to deal with the restoration and reconstruction after natural disasters after the 2010 red mud disaster. The severity of the disaster and the seemingly hopeless situation of those who were affected at the time, highlighted the importance of scientifically examining post-disaster recovery and thus supporting its implementation. At the beginning of the research, my aim was to get to know the processes of Hungarian restoration, the situation of those involved and those affected, and to examine the potential effects of restorations and reconstructions following the biggest natural disasters in rural areas of Hungary in the last 20 years, in an approach of rural development. During the examination of the topic it became clear that due to its complexity (for example: simultaneous damage to society, environment, different areas of the economy, many organizations involved, parallel activities, state intervention, civic and charitable involvement, limited resources and timeframe, self-care, regulatory environment) During the examination of the topic it became clear that due to its complexity it is expedient to narrow down the type and number of disasters to be analysed and the subject of restorations and to deal only with those where significant restoration, on the one hand due to the size limitations of the PhD dissertation, and on the other hand because a full recovery study (following all the domestic disasters so far, in the viewpoint of different areas of society, economy and environment, state and / or civil construction) would require long-term and continuous team work.

Meanwhile, I realized that there are gaps, the scientific gaps that launched my research in the direction that it would be expedient to examine which method makes it possible to explore and evaluate the process of recovery following natural disasters; identification of aggravating factors as well as potential additional gaps to increase the effectiveness of the process.

Based on my experience and information so far, I believe that my research is quite unique in Hungary. The dissertation uses an approach that treats the development of the organization of disaster management as a concomitant of the evolutionary development of society, and in this approach as a social institution.

Societal expectations, including the need for security, have induced the institutionalization of disaster protection and, in fact, simplified the implementation of state-funded restorations. The development of social trust in these organizations plays an important role in the social assessment of the operation of these institutions. Examining how this is evolving for recovery organizations can also be an important factor in assessing the recovery.

Although financial support for post-natural disaster restorations in Hungary is not (either) a mandatory task for the state, due to social expectations, after large-scale disasters, it is almost natural for the state to provide assistance to the affected victims. This can also affect the development of trust, both for the organizations involved in the implementation and for the state as a whole. The management of the public funds of the society, in this case the efficient use of the significant state recovery support provided from the central budget, and the way of its communication for the implementation of the recovery can also be said to be an important factor in the evaluation of the society. Deciding to what extent this will prove to be a politically motivated activity is also a complex question.

Due to the complexity, intricateness of carrying out post-natural disaster restorations, there is a significant amount of data and information, the filtering of which along certain principles was unavoidable for processing. Thus, I make my input data necessary for process exploration and structuring authentic and complete with the data of two Hungarian case studies (recovery after the 2001 flood in Bereg, reconstruction and recovery after the flood in the Sajó Valley in 2010). Using these, I performed primary (empirical) and secondary analysis.

As a scientific problem related to the research on this topic, I find that the scientific assessment deals with it only a little of domestic state recovery processes following natural disasters to theory and practice. Furthermore, the need for a scientifically demanding study of the social, environmental and economic impacts on the area affected by restoration does not appear in Hungarian practice. Also, there is a lack of multidisciplinary procedures for managing complex systems typical of restorations.

In line with the above, due to the complex nature of my topic, I considered it necessary to formulate a comprehensive goal that encompasses the 5 objectives of the research and the 5 hypotheses I set up to achieve the objectives and the methods used to examine them.

The overall purpose and objectives of my research are formulated as follows:

My overall purpose: exploring the processes of domestic central restoration following natural disasters, identifying potential critical processes and development opportunities, in particular with regard to the normalisation of housing conditions, examining the development possibilities of the recovery assessment system.

Objectives of the study:

Objective 1: Analysis of the levels of development of domestic areas affected by natural disaster centralisation in the context of restoration

Objective 2: Examination of the social (institutional) trust in the organizations involved in the processes of the central recovery in Hungary after the natural disaster

Objective 3: Exploring the principles and potential monitoring activities of emergency crisis communication

Objective 4: Examining the practice of international restorations to support the processes of central domestic restoration following natural disasters

Objective 5: Process-based structuring of the current practice of domestic central restoration following natural disasters

My hypotheses related to my objectives were set up as follows:

Hypothesis 1 (H1): The complex development indicators calculated for the affected settlements are suitable for establishing the development of the Hungarian regions affected by the central restoration after the natural disaster and for the short- and medium-term monitoring after the restoration.

In setting up my Hypothesis 1 (H1), I assumed that by using the complex indicator calculation procedure described in Government Decree 105/2015. (IV. 23.), I will have the opportunity to, to identify the potential short- and medium-term social and economic impacts of post-natural disaster recovery in the affected areas examined by me, and to formulate proposals on the possibilities of incorporating the procedure into a potential recovery monitoring system.

Hypothesis 2 (H2): There is a correlation between the level of social trust in the organisations involved in the post-natural disaster process and the public involvement in the recovery.

In my Hypothesis 2 (H2), I assumed that by examining the social trust questionnaire (among other things), I would get an answer to my question, whether the quality of the work and activities performed by the organizations involved in the processes of the central recovery in Hungary following the natural disaster play a demonstrably important role in the assessment of the local society and the affected population. I thought that there was a correlation between the levels of social trust in the organizations involved in the central recovery processes in Hungary after the natural disaster and the public involvement in the recovery. Furthermore, if these two factors are related, the future relationship of the contributing organizations with the affected population (in a period of a potential next recovery), and in “any” interaction in the future with the affected population in the recovery processes, may be particularly important, because this can be an important feedback on the quality of the work done, the (public) assessment of the organization, and the (public) trust in them.

Hypothesis 3 (H3): The follow-up study of the potential effects of the crisis communication activities of the Hungarian central recovery after the natural disaster on the institutional trust of the population is not part of the crisis communication process.

When setting up *my Hypothesis 3 (H3)* (after performing the tests of my Hypotheses 1 and 2), in the possession of the information I had gathered so far I thought that in addition to the operational activities of the coordinating organizations involved in the processes of the

central recovery in Hungary after the natural disaster, their communication activities in crisis situations could also be an important factor in building social trust. Therefore, the organisation coordinating the processes of domestic restoration, and the organisation representing the media's close relationship with it, I saw it as appropriate to examine its crisis communication activities by an interview method to answer (among other things) the question of whether the potential impact of their crisis communication activities (in particular as regards the recovery period) is being monitored by the entities concerned for population levels of trust. With the information gathered until the investigation was carried out, I considered that, as far as restorations were concerned, monitoring activities were not particularly typical, so I assumed that the organisations examined in the crisis communications interview did not monitor the potential impact of their crisis communications activities on public confidence.

Hypothesis 4 (H4): With the content analysis of the methods and results of the international literature and their controlled systematization, it is possible to develop the processes of the domestic central recovery following a natural disaster.

In formulating my ***Hypothesis 4 (H4)***, I thought that in addition to studying domestic practice, analysing the literature and practice of international restorations and collecting “good” practices in line with the supposed critical processes in Hungary, I could provide a useful basis for developing the processes of the domestic system, approaching it from other sides, and evaluating externally.

Hypothesis 5 (H5): Evaluation of the complex system of domestic central restoration following the natural disaster can be developed by means of process-based structuring.

In the initial phase of the research, when formulating ***my H5 hypothesis***, I thought that the difficulties arising from the complexity of restorations, as a set of problems, process-based structuring could be a solution. I therefore assumed that it could be developed by evaluating the complex task system for domestic central restoration following the natural disaster, with process-based structuring. In analysing this, I had an important goal to organize and contribute to the analysis of the development potential of the evaluation system through

process structuring. I would like to note that the formulation of this hypothesis (H5) (and equally my objective 5) in the research process was, in fact, at the first place. However, the examination of this hypothesis actually required the analysis of the other four hypotheses, so that in order to present my results from the examinations of my hypotheses in a logical order, this hypothesis (H5) was placed at the end of the hypothesis order.

Thus, my research topic deals with the processes of central recovery in Hungary after natural disasters, especially with the normalization of housing conditions, and with the theoretical and methodological issues of their evaluation possibilities, as well as with the development possibilities of critical processes identified during the exploration of recovery processes.

I think it is important to point out that *the paper does not criticise organisations involved in recovery, but rather tries to contribute to the evaluation and development of processes.* In this approach, *I do not aim to criticise the voluntary assistance activities of the state, but rather to help it.*

2. DATABASE AND DESCRIPTION OF APPLIED METHODS

I first present the databases and methodologies that serve the overall goal of the research and support the examination of the hypotheses in general, in their contexts, and then I write about each applied methodology separately. I mention the topicality of the examined data and applied methods in the concluding part of the chapter.

I compiled part of my input data necessary for the process exploration and structuring of the post-natural disaster recovery practice, from information obtained during the examination of two significant Hungarian post-disaster recovery practices in the form of a case study, and another part from domestic and international literature and source works.

In the light of the information I have gathered during the research of the topic, I believe that the events in Bereg in 2001 and in the Sajó Valley in 2010 are the most relevant if we want to examine the processes of modern private residential restorations and rebuildings following Hungarian natural disasters. In both cases, there was public, central restoration of private residential real estate. Both restorations were carried out on the basis of the 1999 disaster protection legislative package as the guiding legislative package. In addition to these, both restorations also had specific, ad hoc restoration legislation. After all, as I write in the “Literature Review” chapter of the dissertation, the legal regulation of restorations in Hungary, which contains specific procedures and rules, is prepared on a case-by-case basis, specific to a given event. The disasters of 2010 (floods and floods in 2010 and the red mud disaster) required particularly complex solutions from defence organizations, which increasingly urged the creation of a new package of disaster management legislation. In short, these characteristics justified me to treat these two flood events as case studies, to use the information obtained from them to explore the recovery processes.

The exploration of the two restoration processes was carried out with the help of sample settlements (from the Bereg area: Csaroda, Tákos and Hetefejércse settlements; from the Sajó valley: Felsőzsolca settlement). I have selected them from the list of settlements affected by the damage (based on the internal databases of the Ministry of the Interior's OKF and its branches, as well as the data provided by the relevant water directorates). Regarding these settlements, I performed primary and secondary data collection and data analysis. [Getting to know the Bereg restoration was also helped by a previous questionnaire survey

(autumn 2011), the results of which I will not discuss separately in the dissertation, this helped to establish the research.]

To examine the effects of the two restorations on potential regional development (in connection with the natural disasters in question), I examined all settlements affected by floods and damage, for both floods, as the basic condition for calculating the regional indicator (the indicator cannot be calculated for each settlement alone). For the empirical study (questionnaire survey of social trust), I selected the most affected settlements from the sample settlements, based on their damage data and willingness to provide data. Thus, I selected Csaroda and Tákos settlements from Bereg and Felsőzsolca settlement from the Sajó valley.

I conducted some of my investigations separately for the two restorations (during secondary data collection: legal analysis, document analysis, literature processing, development indicator calculation, process exploration; during primary data collection: empirical research: professional interviews and fieldwork), in addition, I performed data collection and data analysis in a combined manner, covering both restorations (during primary data collection: I conducted professional interviews, social trust questionnaires, crisis communication interviews; during secondary data collection: I used legal analysis, document analysis, process exploration, process concept creation). The legislation, databases and documents used for secondary data collection can be found in the “Bibliography” of the dissertation.

In parallel with the examination of the Hungarian characteristics, I also started the research of the international practice. During the secondary research, I carried out literature content analysis and document analysis, where I explored the international practice and characteristics of restorations. I reviewed case studies, framework agreements, collected good practices, and established the methodological background of my social trust questionnaire.

I show the research steps built on each other with the help of Figure 1.

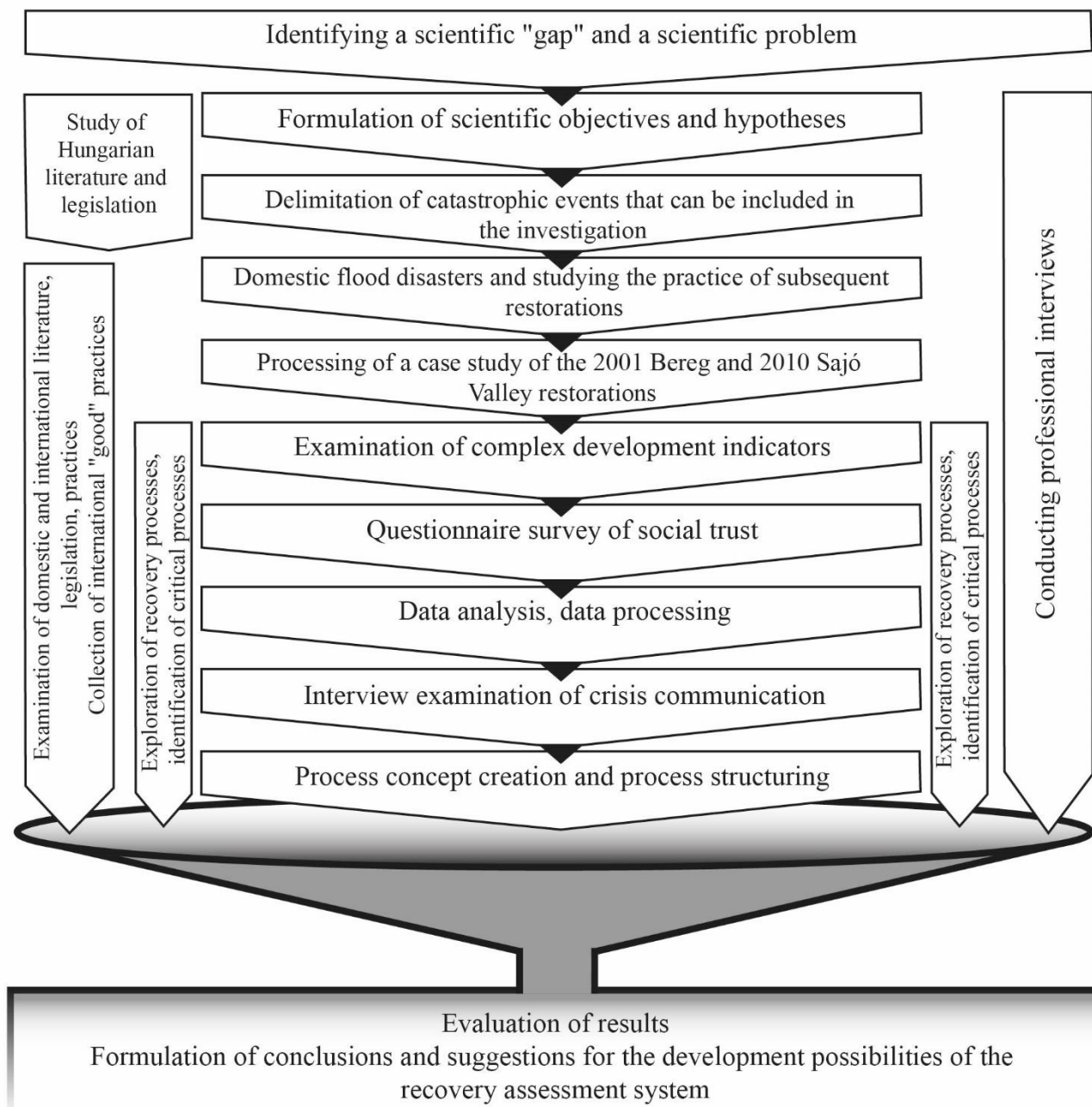


Figure 1: Diagram of the research process

Source: Own research, 2020

During the compilation of the dissertation, I also used my publications on the topic of the dissertation, which contain my most important research units. These are listed at the end of the thesis booklet, under "Papers on which the PhD dissertation is based". The list of sources referred to in the thesis booklet can be found in the "*Bibliography*" of the dissertation.

Databases, applied methodologies

Case study from Bereg and Sajó Valley, recovery process exploration: information gathering embracing the research

Due to the complexity, intricateness of carrying out post-natural disaster restorations, there is a significant amount of data and information, the filtering of which along certain principles was unavoidable for processing. Thus, I validate my input data required for process exploration, concept creation and structuring with the data of two Hungarian case studies (recovery after the 2001 flood in Bereg, reconstruction and recovery after the flood in the Sajó Valley in 2010). I selected sample settlements from the areas affected by the floods (Csaroda and Tákos settlements from Bereg, Felsőzsolca settlements from the Sajó valley), with the help of which I performed my various primary and secondary investigations.

Professional interviews: research-encompassing information gathering

The semi-structured professional interviews that accompanied my research served the purpose of getting to know the Hungarian characteristics, peculiarities and processes of restorations, as well as to validate and agree on the professional content of my questionnaire survey. A key consideration in selecting the interviewees was to interview the most competent professionals for my research topic. After several internet research works, I selected a **total of 7 people** for the professional discussion. Thus, I conducted professional interviews with **7 people**, between 2011 and 2017. (Two people from the National Disaster Management Directorate, two people from the Borsod-Abaúj-Zemplén County Disaster Management Directorate, one person from the Csaroda district notary, one person from the Vásárosnamény Civil Protection Office, and one person from the Northern Hungary Water and Environmental Protection Office.) I had several professional discussions with them to process the case studies and to explore the recovery processes. These were semi-structured professional interviews. The semi-structured nature of the interviews resulted from the fact that the topics of the pre-prepared interview outline were taken in a different direction by the thread of the conversations, supplemented by useful other information (personal experiences). This also provided an opportunity for me to learn more about the recovery

events beyond the examined in the case studies. I have been in contact with these seven people for a longer period of time (or there are some with whom I have a consultation relationship to this day).

Methodology for calculating a complex indicator: Examination of hypothesis H1

As a contribution to *exploring the potential site effects of restorations* following the selected two flood events (as this is little addressed by the profession), and to establish a potential restoration monitoring study, I *calculated regional settlement complex development indicators*. On the basis of the procedure described in the Government Decree *105/2015. (IV. 23.)*. In connection with the floods of 2001: 29 settlements affected by floods, 2001; For 2006 and 2011, with 16 indicator groups (to examine medium-term effects); in connection with the 2010 flood: for 33 settlements affected by flood damage, for 2008 and 2012 I performed calculations with 17 indicator groups of the indicator groups (for the examination of short-term effects). Here, my aim is not only to highlight the difficulties arising from the complexity of the topic (*problems of emergency planning, data collection and systematization, indicator training*), was to determine whether the results obtained *are suitable for drawing further conclusions to identify developmental effects or can be used incorporation into a potential recovery monitoring system*.

Questionnaire examination of social trust: examination of hypothesis H2

A brief presentation of sample settlements and their relevance

In the processes of restorations following natural disasters, the population's sense of security, trust in the organizations, institutions and communities involved in the processes, can play an important role in confirming the performance of the state and civil sphere (mainly quality). It can also help identify critical points in recovery processes. Therefore, I considered that it is important to examine the trust of the population, the organizations and institutions involved in the restoration. Thus, in order to examine the correlations of the restorations with social trust, I conducted a questionnaire survey from the selected two restorations (case studies of 2001 Bereg and 2010 Sajó Valley) with the help of sample

settlements - Csaroda and Tákos settlements from Bereg and Felsőzsolca settlement from Sajó Valley.

On average, 88% of the residential properties in Csaroda and Tákos were affected by restoration. In Felsőzsolca, the proportions did not have such an impact, but in terms of the damage data of the region (Sajó Valley and county BAZ), the settlement represented a significant proportion (84.5% of the residential properties in Sajó Valley affected by restoration, while 56% of the counties), as well as the number of residential properties involved was also significant here.

Methodology for questionnaire survey of social trust

Sample selection

My questionnaire survey on the topic of social trust, based on a personal survey, took place in May 2016, in the named 3 sample settlements (Tákos, Csaroda, Felsőzsolca). Sample selection was based on the principles read in the work of SHARP et al., 2013 and KAZUYA - OZAKI, 2014. When compiling the sample, I tried to achieve representativeness: in terms of gender, age groups and population involvement with recovery (directed: 75% affected; 25% not affected), where I applied the principle of quota sampling (HUZSVAI - VINCZE, 2012). I asked a total of 218 people (Csaroda: 73 people, Tákos: 90 people, Felsőzsolca: 55 people). For selected sample settlements, the number to be queried per settlement was calculated using the population data of the 2011 census database.

Topics surveyed

The questionnaire examines several dimensions simultaneously, from which, to test my hypothesis H2, I included the results of two analysis in the dissertation:

First, I searched the answer to the question of whether there could be a connection between the public involvement in restoration and the levels of trust in the organizations and communities involved in each restoration activity. That is, whether there could be a relationship in the development of involvement and higher or lower levels of trust in the three settlements examined together. (Questionnaires 5 and 8)

Complementing the results of this, I was also curious whether the public involvement with the restoration could be related to the assessment of the importance of the factors (processes) involved in building trust, also examining the three settlements together. (Questionnaires 5 and 14)

In the case of all three sample settlements, I used questionnaires with the same content, in which the content of the questions was also assisted by experts from the National University Of Public Service and the National Directorate General for Disaster Management of the Ministry of the Interior. The scale-type questions of the questionnaire (trust, evaluation, satisfaction, judgment, security levels) were measured on a 5-point scale, based on the method of KAZUYA - OZAKI (2014) and SZABÓ (2014), and since BARTHA - BODA (2016) also confirmed that the five-point scale (analogous to school grades) is most often used in Hungarian data surveys.

Analytical methods used

To evaluate the results of the questionnaires (covering the above two issues), Based on an article by KEHL (2011) Mann-Whitney probes, and principal component analysis based SZŰCS (2015) were performed in the dissertation. Data were analysed using IBM SPSS Statistics® in the fall of 2016 and spring of 2020.

Interview examination of crisis communication: examination of hypothesis H3

In addition to the operational activities of those involved in recovery, their communication activities in crisis situations can also be an important factor in building social trust. Therefore, after the questionnaire survey of social trust, the next step of the research was to explore the crisis communication activities of the restoration coordinating group, the National Directorate General for Disaster Management. This is how I selected my interviewees who are currently working as spokesman and who have been working as a spokesman for many years in the previous period (representing the 2001 and 2010 flood periods). I also considered it important to examine the topic from the point of view of the media, as the communication activity they carry out reaches an extremely wide range of the population. Thus, as a publicly credible source, I also asked an expert from the Hungarian Telegraph Office in the field of disaster management communication with the National

Directorate General for Disaster Management. In total, I interviewed 3 people during the study of the topic. These interviews, like the professional interviews, were semi-structured interviews (BABBIE, 2001). I conducted the semi-structured interviews in the spring of 2017.

Inventory preparation of international “good” practices: examination of hypothesis H4

To collect and summarize international “good” practices, I performed a secondary literature review and processing with the help of several international publication databases. To explore the international practice of restorations examined at the international level, I used a seven-round search procedure (on a principle similar to the method of YI - YANG, 2014) in the period between 2011 and 2020. When collecting the articles, I used the base year 2005 in the first and second search rounds, then I performed searches without a base year in the other search rounds. I illustrate the process of the research with the help of Figure 2.

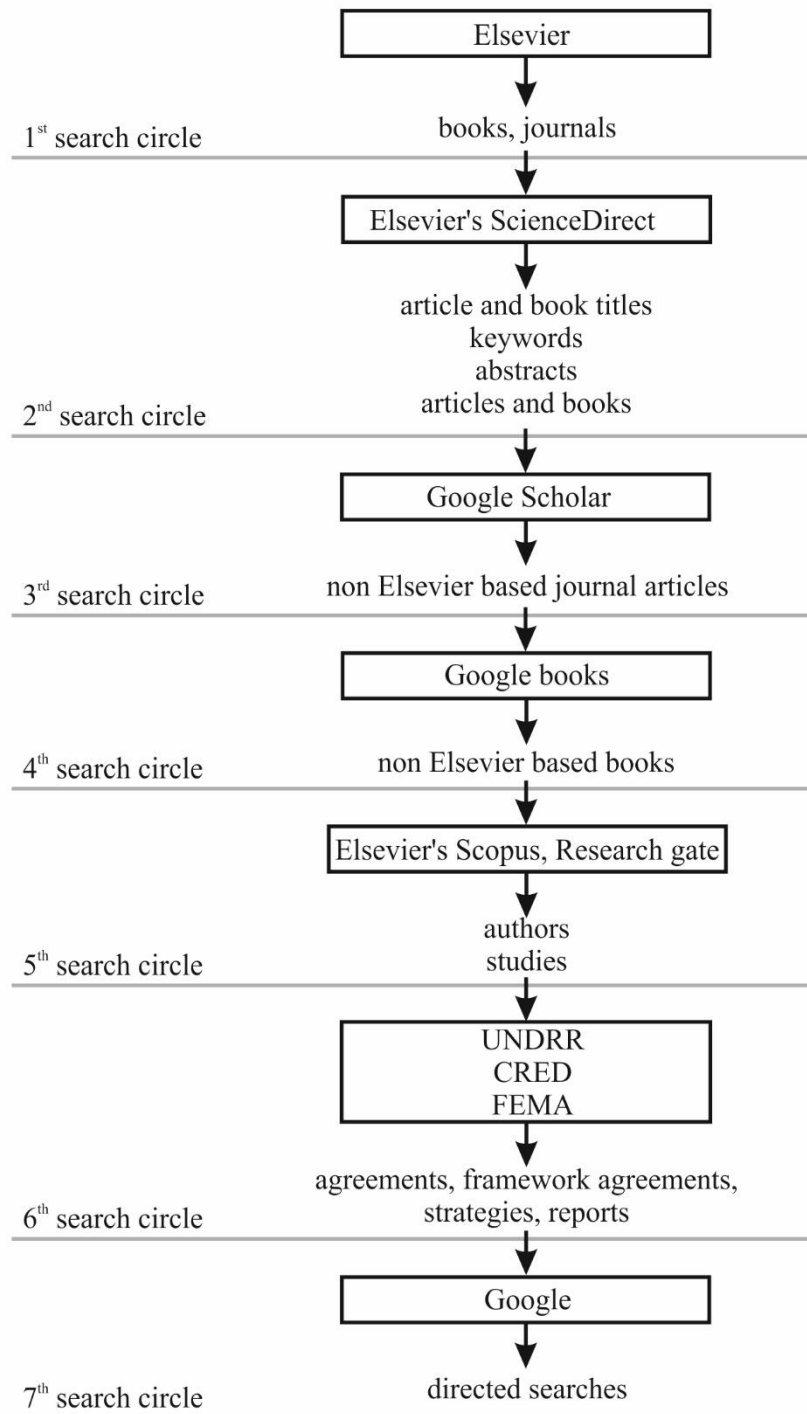


Figure 2: The process of collecting international “good” practices

Source: Own research, 2020

Out of the more than 200 publications collected and processed, I included 45 publications in the chapter “International “good” practices” (because these authors and organizations carried out significant publication and / or practical activities on the topic, so the practices and approaches they used I consider it as a guideline).

Logic of process concept creation: examination of hypothesis H5

The results obtained during the exploration of the source works collected during my research and used and systematized in the dissertation, as well as the practice of two Hungarian flood restorations examined in the form of a case study in my research, furthermore, on the basis of my empirically collected data, I examined the possibilities of process management-based development of the Hungarian recovery assessment system following natural disasters..

I structured the recovery processes, sub-processes and activities mainly on the basis of IFUA Horváth & Partners' (2006) process management concept guidelines and the public service process management recommendations (FEHÉR, 2008; BUDAI, 2008; RÓNAI, 2014; VARGA-POLYÁK, 2014; FARKAS, 2017). In addition, the recommendations described in the chapters “International “good” practices” and “International outlook” played an important role in identifying the sub-processes and activities to be developed. Over and above, during the creation of the process concept and the structuring of the processes, sub-processes and activities, the following - relevant for the examination of domestic restorations – legislations and practices were used: Fundamental law of Hungary (04.25.2011.), the XLIII. law of 2010, the CXIII. law of 2011., the CXXVIII law of 2011., the (II. 15.) government decree of 9/2011. (II. 15.), the 62/2011. (XII. 29.) decree of the ministry of the interior, the 234/2011. (XI. 10.) government decree, the 1150/2012. (V. 15.) government decision, the 9/2018. (X. 4.) instruction of the ministry of the interior and the National Directorate General for Disaster Management, and the practices used in the Bereg and Sajó Valley case studies.

The actuality of the studies and databases

The range of studies performed and databases used in three cases (years of flood events, year of social confidence questionnaire survey, and years of calculation of the complex indicator) needs to be explained. Thus, in the following, I will briefly present them.

In the possession of the information gathered during the research of the topic, in my opinion the events of Bereg in 2001 and Sajó Valley in 2010 are the most relevant if we want to study the process of restorations and rebuildings of private residential real estate following modern natural disasters in Hungary. This is supported in both cases by the number of

people involved, the extent of the restoration and the media coverage of the events. Although a long time has passed since the mentioned catastrophic events, there has been no similarly significant restoration and reconstruction of private residential property in Hungary since then. Consequently, I consider the two events processed as case studies to be relevant to date. The 9 years that elapsed between the two flood disasters caused difficulties for the investigation on the one hand, and opportunities on the other. The difficulties were mainly related to the collection of central databases and the compilation of the questionnaire methodology. However, the long-time that elapsed between the research years also created an opportunity to explore the similarities and differences between the regulation and implementation of the two restorations.

I started my PhD research on the topic in 2012, in which the need for a questionnaire survey was realized in 2015. I finalized the methodology of the questionnaire in 2016, and then the queries were conducted in 2016 as well. However, I still consider my results to be novel to this day, because, to the best of my knowledge, a population survey similar to my own, examining the development of social trust in the context of the 2001 and 2010 flood restorations, has not been conducted since. The content of the databases of the two restorations and the data of the 2011 census (which I used to calculate the number of individuals to be queried in the settlements) are unchanged to this day, compared to 2016. Thus, I consider my results from the 2016 questionnaire survey to be novel results to date.

In the calculation of the complex indicator measuring the socio-economic and infrastructural development of the settlements, in connection with the Bereg case study, I examined the data of 2001; 2006 and 2011. The base year of the study was 2001, because before that, the data sets available from the public database, which ensure the execution of the analysis, were not available. The ideal base year would have been the year 2000, however, in view of the above, I unfortunately did not have the opportunity to examine the settlement data of the previous period. As the disaster occurred long enough ago, I had the opportunity to analyse the medium-term periods (years 5 and 10 after the flood). In this case, my aim was to investigate the identifiability of potential medium-term effects.

With regard to the Sajó Valley case study, as this event was already a closer event to the present time (2010), and as a result, the methodology of central data collection and the disclosure of the resulting data was also much more complete, so I had the opportunity to

examine the 2 years before and 2 years after the flood, to analyse the potential short-term effects. Here it was no longer necessary to include the year of the flood (2010) among the study years (this was not the goal in the case of the Bereg case study either, but rather to fill the data gap), because it turned out to be solvable to calculate the settlement development indicators from these two years (2008 and 2012). Here, my goal was to analyse the identifiability of potential short-term effects.

3. MAIN CONCLUSION OF THE RESEARCH

My 1st hypothesis (H1): “*The complex development indicators calculated for the affected settlements are suitable for establishing the development of the Hungarian regions affected by the central restoration after the natural disaster and for the short- and medium-term monitoring after the restoration*” Based on the results of the study, I believe that in the affected areas examined by me, in order to identify the potential short- and medium-term social and economic impacts of the central recovery after the natural disaster on the areas, the exclusive application of the complex indicator calculation procedure described in Government Decree 105/2015. (IV. 23.) did not prove to be sufficient. With regard to the examined years and settlements, I could not identify clear effects that could be related to the restoration, using only this indicator. In other words, the said procedure, for incorporation into a potential recovery monitoring system, should be supplemented according to my recommendations in my proposals, and then the proposed ones should be performed and tested I would like to note that I have carried out the calculation of the complex indicators for the two domestic case studies analysed, so that overgeneralisation should be avoided, but I consider the studies turned out to be useful because their results have made it possible to identify further future directions for research and thus to start a process in establishing the recovery monitoring system..

I consider the results of the H1 hypothesis study to be relevant to the “Preparation for Potential Recovery” sub-process in the process concept and process structure prepared during the study of the H5 hypothesis, so I have included the “methodological development of the monitoring of complex development indicators” in that sub-process.

Taking the above into account, I interpret my hypothesis H1 in the first Thesis (T1) as follows:

1st thesis (T1): In order to establish the basis for the examination of the short- and medium-term monitoring of the development of the Hungarian regions affected by the central restoration after the natural disaster, the complex development indicators according to the procedure described in Government Decree 105/2015. (IV. 23.), are not suitable in themselves.

My 2nd hypothesis (H2): “There is a correlation between the level of social trust in the organisations involved in the post-natural disaster process and the public involvement in the recovery.” Based on the results of my study, I believe that in order to answer the question I asked when formulating Hypothesis H2, - whether the local society can be proved to play an important role in the assessment of the affected population, the quality of work and activities performed by the organizations involved in the domestic central recovery processes after the natural disaster - the analysis of the primary and additional correlation studies were suitable.

My assumption made when performing the primary correlation analysis, – that there is a correlation between the levels of social trust in the organizations involved in the central recovery processes in Hungary following a natural disaster and the public involvement in the recovery, – by treating the studied settlements together, it was confirmed for 8 (out of the 12 examined organizations) organizations involved in restoration, (*Disaster Management, Domestic Army, Police, Water Management, Local Government, Insurance, Non-Governmental Organizations, Scientific Institutions*)) according to the applied Mann-Whitney test. In other words, in the case of these organizations, the quality of the work and activity performed by them plays a proven important role in the assessment of the local society and population in the 3 settlements examined. Furthermore, I believe that in the case of these 8 organizations, the future (in a period of a potential next recovery) relationship of the contributing organizations with the affected population may be particularly important, so the future “any” interaction with the affected population in the recovery processes, as the development of the trust levels of the affected population can be an important feedback on the quality of the work performed, the (public) assessment of the organization, the (public) trust in them.

Complementing the results of this, when conducting the analysis of the additional correlation analysis, I was also curious whether the public involvement in the restoration could be related to the assessment of the importance of the factors (processes) involved in building trust. As part of the analysis - reducing the number of 7 categories (recovery process) included in the analysis - the main component obtained as a result of the principal component analysis was further examined as “main component of assessment of restoration activities” and its correlation with population restoration involvement. Based on the Mann-

Whitney test, however, there was no significant difference between the studied variables. So, there is presumably no correlation between the variables examined.

From the point of view of evaluating the results of hypothesis H2, I think that the duality is not a problem, that in the first case there was a correlation for 8 organizations, and in the additional study there was no correlation for the examined variables. As the latter hypothesis only examined the trust relationships of the importance of recovery processes. My primary goal was to explore the relationship between levels of social trust and public involvement in recovery, which was accomplished through the primary correlation research.

However, the results of the additional correlation study may also suggest that the affected population “links” institutional trust with the intermediary organizations (in this case 8 organizations) rather than with the restoration processes. (However, this is only a further thought, no specific analysis has been made for the proof.) In this case, however, it is presumably even more important for the identified organizations to pay attention to their direct contact with the population, as it seems that from the point of view of the population, this may be the determining factor rather than the individual process elements. It may be more important who carries out the process and not the process itself.

The validity of researches: In the case of the primary correlation study, the correlation was confirmed in 8 cases based on the combined data of the three settlements examined (here in 8 cases there was a proven correlation with respect to the examined variables), in the additional correlation study, also based on the combined data of the three detectable (there was demonstrably no correlation here for the variables examined), but the evidentiary procedures were valid. The tested samples (variables) in both cases were suitable for performing the procedures and their evaluation. However, I consider it appropriate to take into account the factors that distort / complicate the analysis in all cases.

I consider it relevant to incorporate the results of Hypothesis H2 into the process concept and process structure prepared during the examination of Hypothesis H5 with regard to the sub-process “Preparing for Potential Recovery”, thus the activity “Development of the methodology of the questionnaire survey examining institutional trust” was included in the sub-process.

Taking the above into account, I interpret my hypothesis H2 in my second Thesis (T2) as follows:

2nd thesis (T2): There is a correlation between the public involvement in domestic central recovery after a natural disaster and the level of social trust in communities involved in the implementation of domestic central recovery processes following a natural disaster (Disaster management, Domestic Army, Police, Water management, Local government, Insurance, Non-governmental organizations, Scientific institutions) in relation to the settlements examined.

My 3rd hypothesis (H3): *“The follow-up study of the potential effects of the crisis communication activities of the Hungarian central recovery after the natural disaster on the institutional trust of the population is not part of the crisis communication process.”* Based on the results of my study, I believe that the method of semi-structured professional interview proved to be suitable for the analysis of the issue, and that the three professionals involved in the interview adequately cover the professional and practical “requirements” needed to present domestic conditions. To explore the crisis communication activities of emergencies, based on the responses to the interview, I created a process summary diagram, adapted to the processes of disaster management, of the main crisis communication principles, the activities to be implemented and the critical points. Based on this, I was able to identify which activities may have the potential to improve the crisis communication sub-process of recovery processes. When asked whether the potential effects of their crisis communication activities (especially during the recovery period) on public confidence levels are monitored by organizations “represented” by the interviewees, I was told that this activity unfortunately does not take place, and are not expected to be planned in the near future, for the organizations examined (the National Disaster Management Directorate of the Ministry of the Interior and the Hungarian Telegraph Office). The interviewees answered independently, the separate nature of the interviews did not give an opportunity to potentially influence each other. That is, my assumption which has been made when setting up my hypothesis was confirmed in this case. The critical activity, in the case of both examined organizations, was the “external monitoring”, that is the lack of follow-up examination of the levels of public confidence. However, in the processes of central

recovery in Hungary after a natural disaster, in the possession of the information I have gathered, I believe that in addition to the operational activities of the participating, coordinating organizations, their communication activities in crisis situations can be important factors in building social trust. However, I would mention that the results I obtained during the examination of my hypothesis H3 represent the period of conducting the interviews. Although an initiative in this direction could be launched in the spring of 2017 at the examined organizations, its implementation and testing, in the lack of a large-scale domestic central restoration, could not be realized. That is, I consider the results obtained during the examination of my hypothesis H3, until the day of submitting the dissertation, to be justified.

I consider that it is relevant to build in the results of Hypothesis H3 into the process concept and process structure prepared during the examination of Hypothesis H5 with regard to the subprocess of “Preparing for Potential Recovery”. Thus, the activity of “Development of the methodology of the questionnaire survey examining the social effects of communications (communication messages)” was included in the named sub-process.

Taking the above into account, I interpret my hypothesis H3 in my third Thesis (T3) as follows:

3rd thesis (T3): Follow-up study of the potential effects of the crisis communication activities of the domestic central recovery after natural disasters on the institutional trust of the population is not a part of the crisis communication activities of the organizations involved in the interview.

My **4th hypothesis (H4)**: *“With the content analysis of the methods and results of the international literature and their controlled systematization, it is possible to develop the processes of the domestic central recovery following a natural disasters.”* based on the results of my study, I believe that my supposition was formulated when setting up my hypothesis – according to which, by analysing the content of the literature and practice of international restorations, and by collecting “good” practices in line with the supposedly critical processes in Hungary, I will be able to provide a useful basis for developing, approaching and externally evaluating the processes of the domestic restoration system –

has been certified. Because, after all, a structured international collection similar to my own has not been made in Hungary so far. The 7-search approach (similar method to what YI - YANG, 2014 uses) that I have used to research the literature proved to be suitable for collecting and organizing “good” practices. My secondary data collection during the examination of Hypothesis H4 proved to be sufficient to highlighted the procedures, approaches, critical decision situations, adaptations to be considered at the domestic level, which have already been examined at the international level and come from relevant sources and also have results and conclusions. From the international “good” practices and the international outlook, I identified 5 “good” practices, benchlearning bases for the development of the domestic recovery process, for which I also indicated the proposed authors. And I put the identified “good” practices into the recovery process structure. The aim of examining the hypothesis was achieved, because with the content analysis I was able to identify recovery practices in international articles, strategies, framework agreements that can help the development of the domestic implementation and can be used as its benchlearning. Not forgetting, of course, that the literature on disaster recovery is expanding quite rapidly at the international level (so it is likely that the number of potential domestic good practices may increase over time), for as much as the time and source limitations of the dissertation, I think , that the obtained results can be utilized in the sub-processes and activities I have defined in order to optimize the currently applied domestic practice.

I consider it relevant to build in the results of Hypothesis H4 in the process concept and process structure prepared during the examination of Hypothesis H5: “Preparing for Potential Recovery”; “Coordination (Continuous Monitoring)” and “Monitoring the Social, Economic and Environmental Impacts of Restoration”, thus, the activities assigned to them were also included in the named subprocesses.

Taking the above into account, I interpret my hypothesis H4 in my fourth Thesis (T4) as follows:

4th thesis (T4): “*With the content analysis of the methods and the results of the international literature and their controlled systematization, it is possible to develop the specific processes of the domestic central recovery after natural disasters.*”

My 5th hypothesis (H5): *“Evaluation of the complex system of domestic central restoration following the natural disaster can be developed by means of process-based structuring.”*

Based on the results of my research, I believe that my assumption made in the initial phase of the research, - according to which the process-based structuring can be a solution for the management of the complex system of restorations - largely proved, however, due to the size and complexity of the topic and the extent and time limitations of the dissertation, the conceptual process concept and process structure that I created cannot explore or structure category of levels below the activity. My other assumption, – according to which the evaluation of the complex task system of the central recovery in Hungary after a natural disaster can be developed with the help of process-based structuring – was also partially verified, due to the limitations of time and extent, the research no longer provided an opportunity for the actual evaluation and testing of the identified process elements. In the period of testing Hypothesis H5, (in the period covering my research) process-based exploration and structuring of recovery after domestic natural disasters is a completely new approach in Hungary thus, in the lack of a “starting point”, my research was able to explore the development possibilities of the evaluation system, and was able to contribute to the creation of a theoretical concept, and to formulate “recommendations”. In other words, during the analysis of Hypothesis H5, in order to support the evaluation of the recovery processes (to improve a recovery assessment system) after natural disasters (in particular the normalization of housing conditions). I explored the international and domestic literature, legal and practical features (through case studies and professional interviews), the processes, sub-processes, activities and basic indicators of the domestic restoration to be examined, and I performed recovery-specific analysis (calculation of a complex indicator, analysis of social trust and crisis communication). Along these lines, I suggested new sub-processes, activities, indicators, measurement and data collection periods, and future research directions. The results of the examination of Hypothesis H5 contribute to the development of the recovery evaluation system by the development of a process-based conceptual structure and the identification of further, future research directions. In my opinion the academic process concept and process structure I have developed can support both the future evaluation work of practitioners and the analytical work of scientific need. However, like all theoretical frameworks, this system has its limitations, which can

influence its implementation and applicability. I will discuss these in detail in the part of the dissertation that presents the process structure creation, and I recommend the application of the mentioned process concept and process structure, taking into account of the limitations. In connection with the studies of my hypothesis H5, I highlight that these studies embrace my entire research, such as H1; H2; H3; H4, these results of my hypotheses are also built into the test results of H5. That is, I also used the results of these in the process concept and process structure (the results of the H1; H2; H3; H4 tests are also used among the results of H5).

The aim of the examination of my hypothesis H5 was realized in general, because I systematized the domestic central recovery processes into a theoretical framework with the help of process structuring and thus I believe that I contributed to the analysis of the development possibilities of the evaluation system.

Taking the above into account, I interpret my hypothesis H5 in my fifth Thesis (T5) as follows:

5th thesis (T5): Development of the Hungarian central recovery assessment system following natural disasters can be supported with the help of process-based structuring.

4. NEW RESULTS AND NOVELTIES OF THE RESEARCH

I consider it as a novel result, that I contributed to establish the development of short-term and medium-term monitoring after the recovery of the Hungarian regions affected by the central recovery after a natural disaster, and to the advance planning of preparations for recovery following a potential natural disaster, by calculating complex development indicators for the areas studied in the research, and by formulating proposals based on their results.

I also consider it as a novel result, that I examined the correlations between the levels of social trust in the organizations involved in the central recovery processes in Hungary after the natural disaster and the public involvement in the recovery with regard to the sample settlements, and with my results and suggestions I contributed to the development of the methodological basis of a potential new questionnaire survey examining social trust.

As well as, I consider it as a novel result, that as a result of an interview exploratory examination of the emergency crisis communication activity on the topic of disaster management, I created a process summary diagram, adapted to the processes of disaster management, about the main crisis communication principles, activities to be implemented and critical points. Based on this, I was able to identify which activities may have the potential to improve the crisis communication sub-process of recovery processes for the two organizations examined.

In addition, I consider it as a novel result, that by analysing the content of the methods and results of the international literature on disaster recovery and their controlled systematization, summarizing “good” practices regarding specific processes of central disaster recovery in Hungary, I have identified adaptation benchlearning opportunities to be considered at the domestic level.

I consider it as a new result, that in order to support the evaluation of the processes of recovery after natural disasters (especially the normalization of housing conditions) (to develop a recovery evaluation system), I explored the international and domestic literature, legislation, practical features (with the help of case studies and professional interviews), the processes and sub-processes, activities, basic indicators, as well as recovery - specific analysis (calculation of a complex indicator, analysis of social trust and crisis

communication). As well as suggesting new sub-processes, activities, indicators, measurement and data collection periods, and future research directions along these.

Overall, *I realize the novelty of the dissertation* in the fact that I have not encountered a scientific researches for a process-based exploration of central restorations following natural disasters, similar to my own, in the period of my research (September 2012 to June 2020), with regard to Hungary.

5. APPLICATION OF RESULTS IN PRACTICE

In the aftermath of a disaster, it is also a social expectation and an economic interest to rescue, to implement human and material property without delay, and to return to normalcy before the disaster. Implementing the efficient distribution of funds collected from state and other places (e.g.: NGOs, private sector donations) for disaster relief in confusing situations in an emergency is an equally important, open task for the state and society (author's own publication: KISS, 2013a). In my view, in the light of these, research to support the work of professionals coordinating and performing security tasks is becoming increasingly important. All the more, that the post-disaster decision-making is a poorly understood activity. Under the pressure of time, the decisive factor in making decisions is that we are mentally forced to return to normal everyday life, to the normal flow. In general, there is no time for participants to record how decisions were made, what information is available and what is missing, and what results it brings in terms of recovery, speed, quality, or resilience (ALEXANDER, 2002). Considering all the difficulties, the disaster management's decision-making proves to be almost impossible (BOIN - HART, 2003).

Numerous international, foreign studies deal with the post-disaster recovery of areas affected by natural disasters, however, there is no integrated, uniformly accepted methodology for examining these processes, which makes it difficult to accurately analyse the potential social and economic impacts on the affected areas. According to SMITH - WENGER (2006), post-disaster recovery is considered by both the research community and practitioners to be one of the least understood areas of emergency management, requiring a multidisciplinary approach, which is one of its main difficulties.

Over the years, several publications have been published in Hungary, which have analysed the system of flood protection, restoration and reconstruction in various aspects, but more and more on the basis of technical, architectural and tourist, as well as sociological aspects. The Hungarian professional and scientific environment deals less with the process-based approach to restorations. Emphasizing that there is no globally consistent approach and thinking in the field of post-disaster recovery (taking into account that international scientific researches have also examined the topic from different perspectives, with different methodologies) contributing to the creation of a mature procedure, I believe that it can help

professionals a lot in eliminating chaotic states, contributing to the implementation of effective and measurable recovery projects, also in Hungary. There is a serious difference in scale between the magnitude of catastrophes in Hungary and the size of catastrophe events appearing in international scientific research, journals and databases. The majority of international researches examining the topic are about significant events even in the international level, which, on the whole, have a much larger population involvement and damage data than the Hungarian ones. However, this does not mean that domestic scientific research should have little emphasis on examining the topic. On the contrary, as we have already faced several numbers of significant natural disasters in our country, and due to climate change, we will probably have to fight more and more (the author's own publication: KISS, 2015b).

As described above, I believe that it is necessary to involve approaches such as my own in domestic practice, which reflect a multidisciplinary, holistic and long-term approach. In my opinion, my work has succeeded in contributing to the partial filling of the scientific “gap” which I formulated in the initial phase of the research. During the analysis of which, with the involvement of the social sciences, in a multidisciplinary approach, through process-based exploration and structuring of the practice of domestic central recovery after a natural disaster, I tested methods, identified critical processes, collected international “good” practices, proposed new activities and complicating factors, and also explored aggravating factors and made recommendations for complementing the methods used and future directions for research development. I tried to do all this with the approach that when closing a significant phase of the research (in this case when submitting the PhD dissertation), the knowledge that I composed can be useful, and can be used by practitioners and by the scientific community also.

I recommend my results, conclusions and suggestions to all researchers and professionals who are planning to deal with the processes of the Hungarian recovery system.

6. PUBLICATIONS RELATED TO THE STUDY



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Registry number: DEENK/126/2020.PL
Subject: PhD Publikációs Lista

Candidate: Alida Kiss
Neptun ID: L98A2B
Doctoral School: Károly Ihrig Doctoral School of Management and Business
MTMT ID: 10029934

List of publications related to the dissertation

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