Urban Resilience in Indonesia
Assessing and Evaluating Development Strategies in Yogyakarta and Surakarta

inngeo - Innsbrucker Materialien zur Geographie Volume 17

Karl Michael Höferl and Simone Sandholz (Eds.)
A growing part of the urban population worldwide is living in areas at risk, likely to be exacerbated by environmental deterioration or climate change. Thus, enhancing urban resilience to natural hazards became a development imperative. Particularly for poorer and often more vulnerable households enhanced resilience is of great relevance: Since risk reduction strategies are often absent for informal settlers, community-based approaches to enhance resilience can have significant impacts on local livelihoods.

Indonesia is among the countries where such strategies are of utmost importance. The multi-island country is prone to various natural hazards, including earthquakes, volcanic eruptions, tsunamis, landslides and floodings. Especially on Java – the most densely populated island of the country – risk-sensitive development approaches for the fast growing urban agglomerations are crucial.

From March 2014 to June 2015 ten students within the master programme «Geography – Global Change and Regional Sustainability» at the University of Innsbruck evaluated and developed community-based strategies towards urban resilience in Indonesia. Focusing on Yogyakarta and Surakarta as study sites on Java Island, the students put a special emphasis on how local communities, municipal administrations and NGOs try to cope with existing and future stressors, shocks and change processes.
Urban Resilience in Indonesia – Assessing and Evaluating Development Strategies in Yogyakarta and Surakarta

Edited by Innsbrucker Studienkreis für Geographie, 2017
ISBN: 978-3-901182-78-5

Printed with financial support of the International Relations Office, University of Innsbruck, Austria.

Review: Christian Obermayr, Christian Steiner, Ernst Steinicke
Design and typesetting: Jana Fürstenberg, Karl Michael Höferl
Cover: Jana Fürstenberg, images by Simone Sandholz and Karl Michael Höferl
Druck: Druck.at

About inngeo - Innsbrucker Materialien zur Geographie
Edited by Innsbrucker Studienkreis für Geographie, inngeo includes edited, (partially) reviewed lecture manuscripts, excursion reports, project reports as well as short summaries of diploma and doctoral theses, which are beyond the scope of the ‘Innsbruck Geographical Studies’ series. It focuses on student readers, is digitally published and provided via the homepage of the Institute of Geography, University of Innsbruck, Austria. Volumes appear irregularly.

© Innsbrucker Studienkreis für Geographie ZVR 568774553 Innrain 52, 6020 Innsbruck
This work is licensed under a Creative Commons Attribution-ShareAlike 4.0 International License.
Urban Resilience in Indonesia
Assessing and Evaluating Development Strategies in Yogyakarta and Surakarta

Karl Michael Höferl & Simone Sandholz (Eds.)

Final Report of the elective area «Development Research»
within the master programme
«Global Change – Regional Sustainability»
Institute of Geography
University of Innsbruck, Austria

Contributing authors:
Jana Fürstenberg, Kilian Hinzpeter, Karl Michael Höferl,
Leonard Hoyos, Stefan Niederer, Simon Kranebitter,
Susanne Kubisch, Christian Obermayr, Simone Sandholz,
Fabian Sandholzer, Tim Salow, Dominik Scheuer, Nils Unthan
# Table of contents

1. Introductory remarks ........................................................................................................... 1

2. Indonesia – a geographical overview ................................................................................. 4
   2.1 Climate and vegetation ........................................................................................................ 5
   2.2 Natural hazards .................................................................................................................. 5
   2.3 History ................................................................................................................................ 6
   2.4 Structure of the state .......................................................................................................... 9
   2.5 Recent administrative policies and population development .............................................. 10
   2.6 Economy ........................................................................................................................... 12
   2.7 Urban development in Indonesia ....................................................................................... 14
      2.7.1 Historic development .................................................................................................... 14
      2.7.2 Indonesian and Javanese city models ........................................................................... 15
   2.8 Introduction to Yogyakarta and Surakarta ......................................................................... 18
      2.8.1 Yogyakarta .................................................................................................................. 18
      2.8.2 Surakarta .................................................................................................................... 20
   2.9 Bibliography ....................................................................................................................... 22

3. Coping with socio-economic transformations and natural-hazards in Yogyakarta’s Kampungs ............................................................................................................ 24
   3.1 Introduction to Yogyakarta City .......................................................................................... 24
      3.1.1 Urban hazards and risks ............................................................................................... 25
      3.1.2 Urban planning and housing policy .............................................................................. 25
         3.1.2.1 Land rights and ownership structures in Yogyakarta ................................................... 25
         3.1.2.2 Urban planning and housing regulations in Yogyakarta ........................................... 26
   3.2 Motivation .......................................................................................................................... 26
      3.2.1 Deduction of research questions ................................................................................... 27
      3.2.2 Methods ....................................................................................................................... 28
      3.2.3 Analysis and evaluation scheme ................................................................................... 29
   3.3 Theoretical background ..................................................................................................... 29
      3.3.1 The concept of resilience ............................................................................................. 29
      3.3.2 Urban resilience ............................................................................................................. 30
      3.3.3 The DPSIR Framework ................................................................................................. 31
      3.3.4 Selection of research areas (RAs) ................................................................................ 33
   3.4 Introduction to the research transect area ........................................................................... 34
      3.4.1 Introduction ................................................................................................................... 34
         3.4.1.1 Geographical situation of Code River transect ............................................................ 34
         3.4.1.2 Characterisation of Code River transect .................................................................... 37
      3.4.2 Large scale urban transformation and responses .......................................................... 38
         3.4.2.1 Influence of natural hazards on urban development in Code River transect .......... 38
         3.4.2.2 Strategies of communities to cope with natural hazards in Code River transect ....... 39
         3.4.2.3 Influences of socio-economic processes on urban development in Code River transect .......................................................................................................................... 41
         3.4.2.4 Strategies of communities to cope with socio-economic stressors and disruptions in Code River transect ................................................................................................... 44
   3.5 Assessment of Research Area 1 ........................................................................................ 45
4. Evaluating the impacts of hazard-driven relocations on local livelihoods in Surakarta

4.1 Introduction to Surakarta

4.2 Methodology

4.3 Impacts of the relocation on local livelihoods

4.4 Assessment of the relocation

4.5 Conclusions
Urban Resilience in Indonesia

4.5 Impacts of relocation on local livelihoods in Pucang Sawit ............................................................. 162
   4.5.1 The “old site” in Pucang Sawit .................................................................................................. 162
   4.5.2 The newly built park in Pucang Sawit ...................................................................................... 164
   4.5.3 Analysis approach ...................................................................................................................... 164
   4.5.4 Evaluation of data ...................................................................................................................... 165
       4.5.4.1 Impact on physical capital ................................................................................................. 165
       4.5.4.2 Impact on financial capital ................................................................................................. 170
       4.5.4.3 Impact on natural capital .................................................................................................. 172
       4.5.4.4 Impact on human capital .................................................................................................. 175
       4.5.4.5 Impact on social capital .................................................................................................... 177
   4.5.5 Conclusions .............................................................................................................................. 180
   4.5.6 Further outlook ......................................................................................................................... 182

4.6 Evaluation of goals ........................................................................................................................ 182
   4.6.1 Introduction .............................................................................................................................. 182
   4.6.2 Theoretical Framework ........................................................................................................... 182
   4.6.3 Interests of the involved parties ............................................................................................... 184
       4.6.3.1 Well-being of citizens ...................................................................................................... 184
       4.6.3.2 Legalisation of land tenure .............................................................................................. 185
       4.6.3.3 Cheaper protection from natural hazards ........................................................................ 185
       4.6.3.4 Navigable river ................................................................................................................. 185
   4.6.4 Positions of the involved parties .............................................................................................. 185
       4.6.4.1 Satisfaction of basic needs ............................................................................................... 186
       4.6.4.2 Conversion and re-use of riverbank area ....................................................................... 187
       4.6.4.3 Land certificates ................................................................................................................. 187
       4.6.4.4 Protection from natural hazards ......................................................................................... 188
   4.6.5 Outcomes of the evaluation ..................................................................................................... 188
       4.6.5.1 Satisfaction of basic needs ............................................................................................... 188
       4.6.5.2 Transforming the riverbank area ...................................................................................... 190
       4.6.5.3 Land certificates ................................................................................................................. 191
       4.6.5.4 Protection from natural hazards ......................................................................................... 192
   4.6.6 Conclusion ............................................................................................................................... 193

4.7 Overall conclusions ....................................................................................................................... 194
   4.7.1 Linkages between research questions ....................................................................................... 194
   4.7.2 Needs for relocation ................................................................................................................ 195
   4.7.3 Relocation benefits .................................................................................................................. 196
   4.7.4 Realisation of the relocation programme ................................................................................. 196
   4.7.5 Suggestions for improvement .................................................................................................. 196

4.8 Bibliography .................................................................................................................................... 198

4.9 List of Interviews ............................................................................................................................ 199

5. Urban Resilience in Indonesia – Discussion and conclusions .......................................................... 200
   5.1 Yogyakarta: Squaring the circle – taking chances and avoiding risks ........................................... 201
   5.2 Surakarta: Transformability in action? ......................................................................................... 202
   5.3 Final conclusions ......................................................................................................................... 203
   5.4 Bibliography .................................................................................................................................. 205

6. Appendix ........................................................................................................................................... 206
   6.1 Appendix Yogyakarta .................................................................................................................... 206
       6.1.1 Guideline for expert interviews and other key persons ...................................................... 206
6.1.2 Questionnaire for participating mapping with stakeholder.................................208
6.1.3 Household questionnaires.....................................................................................211
6.2 Appendix Surakarta ................................................................................................213
6.2.1 Questionnaire for the relocated families of Pucang Sawit..................................213
6.2.2 Evaluation and clustering of Question 22..............................................................220
6.2.3 Evaluation and clustering of Question 23..............................................................221
6.2.4 Interview guideline for authorities and administration ........................................222
6.2.5 Interview guideline for local experts....................................................................224
## Glossary

<table>
<thead>
<tr>
<th>Abbreviation/term</th>
<th>Definition</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bantul</td>
<td>District in the province of Yogyakarta</td>
</tr>
<tr>
<td>BPS</td>
<td><em>Badan Pusat Statistik</em> – Statistics Indonesia</td>
</tr>
<tr>
<td>Desa</td>
<td>Village</td>
</tr>
<tr>
<td>DRR</td>
<td>Disaster Risk Reduction</td>
</tr>
<tr>
<td>GDP</td>
<td>Gross domestic product</td>
</tr>
<tr>
<td>Kampung</td>
<td>Traditional urban or rural residential area, sometimes also used as a synonym for an Indonesian slum settlement</td>
</tr>
<tr>
<td>Kecamatan</td>
<td>Sub-district of an Indonesian city</td>
</tr>
<tr>
<td>Kelurahan</td>
<td>Quarter of an Indonesian city</td>
</tr>
<tr>
<td>Kota</td>
<td>City</td>
</tr>
<tr>
<td>Kraton</td>
<td>Seat of the Sultan, Sultan’s palace</td>
</tr>
<tr>
<td>Merapi</td>
<td>Volcano in Java</td>
</tr>
<tr>
<td>PAREANOM</td>
<td>Bottom-up community with focus on early warning regarding disasters</td>
</tr>
<tr>
<td>Pokja</td>
<td>Working group, often temporary established to fulfil a given task</td>
</tr>
<tr>
<td>PDI-P</td>
<td><em>Partai Demokrasi Indonesia Perjuangan</em> - Indonesian Democratic Party of Struggle</td>
</tr>
<tr>
<td>RT</td>
<td><em>Rukun Tetangga</em> – ‘neighbourhood’ (smallest administrative unit), consist of 10 up to 50 households</td>
</tr>
<tr>
<td>RW</td>
<td><em>Rukun Warga</em> – ‘community unit’ (second smallest administrative unit), consists of 5 up to 10 RTs</td>
</tr>
<tr>
<td>Sleman</td>
<td>District in the province of Yogyakarta</td>
</tr>
<tr>
<td>Transmigrasi</td>
<td>Resettlement programme; mainly for landless Javanese farmers and unemployed city dwellers</td>
</tr>
<tr>
<td>UGM</td>
<td><em>Universitas Gadjah Mada</em> – University in Yogyakarta</td>
</tr>
<tr>
<td>Ulu-Ulu</td>
<td>Informal group, which monitors the river Code; especially providing information about water levels</td>
</tr>
<tr>
<td>UNS</td>
<td><em>Universitas Sebelas Maret</em> – University in Surakarta</td>
</tr>
<tr>
<td>VOC</td>
<td><em>Vereenigde Oostindische Compagnie</em> - Dutch East India Company</td>
</tr>
<tr>
<td>Warung</td>
<td>Traditional Indonesian takeaway</td>
</tr>
</tbody>
</table>
List of Tables

Table 1: Schedule of field work in Indonesia ................................................................................. 3
Table 2: Evaluation of strategies in RA 1 ....................................................................................... 61
Table 3: Evaluation of strategies in RA 2 ....................................................................................... 80
Table 4: Evaluation of strategies in RA 3 ....................................................................................... 91
Table 5: Exposure to natural hazards in RAs 1 to 3 ...................................................................... 98
Table 6: Resilience check for RAs 1 to 3........................................................................................ 110
Table 7: Interviews conducted in Yogykarta .................................................................................. 116
Table 8: Relation between expenditures and incomes .................................................................... 143
Table 9: Overview on impacts and effects on different forms of capital ........................................ 145
Table 10: Clustering of Q22: “Why are you satisfied or non-satisfied?” ........................................ 149
Table 11: Linkage between inclusion in planning process and personal satisfaction ................. 151
Table 12: Linkage between being able to make requests in matter of the resettlement and personal satisfaction ........................................................................................................... 151
Table 13: Final clustering of answers to Q23: “Is there anything you would improve in the relocation process?” ................................................................. 152
Table 14: Perspectives of experts and resettlers on the relocation process ....................................... 160
Table 15: Positive, indifferent and negative effects on physical capital ........................................ 169
Table 16: Positive effects on financial capital .................................................................................. 171
Table 17: Positive and negative effects on natural capital .............................................................. 174
Table 18: Positive and negative effects on human capital ............................................................. 176
Table 19: Positive and negative effects on social capital .............................................................. 179
Table 20: Comparison of interests of affected households and municipal administration ........................................................................................................................................................................ 184
Table 21: Overview on interviews conducted in Surakarta ............................................................. 199
List of Figures

Figure 1: The research team................................................................................................................. 2
Figure 2: Overview of Indonesia and neighbouring states................................................................. 4
Figure 3: Administrative structure of Indonesia .................................................................................. 10
Figure 4: Population Growth Rate (in %) in Indonesia and Java from 1980 to 2015
and projection for 2015 to 2035........................................................................................................ 11
Figure 5: Population density in Indonesia (2010) .................................................................................. 11
Figure 6: GDP growth rate (in %) of MINT-states and industrialised countries ....................... 13
Figure 7: Entrance of a Kampung along Malioboro Street in Yogyakarta .................................... 15
Figure 8: A model of Indonesian city structure .................................................................................... 16
Figure 9: Spatial division of a Javanese palace city ............................................................................ 17
Figure 10: Location of Surakarta and Yogyakarta .............................................................................. 18
Figure 11: Textile market in Yogyakarta.............................................................................................. 20
Figure 12: Adaptive governance within the DPSIR framework............................................................ 31
Figure 13: Adaptive governance within the DPSIR framework in detail ........................................... 32
Figure 14: Touristic services at Malioboro Street .............................................................................. 35
Figure 15: Surrounding area - Code River transect .......................................................................... 36
Figure 16: New hotel building in the East of RA 3 ............................................................................ 38
Figure 17: Broken wall embankment in RA 3 ...................................................................................... 41
Figure 18: Brownfield area near to RA 3 ............................................................................................ 42
Figure 19: Current development processes in Code River transect .................................................. 43
Figure 20: View towards north on RA1 - RW 06 in front ................................................................... 45
Figure 21: Bazar between RW 05 and RW 06...................................................................................... 47
Figure 22: Location and basic facilities of RA1 .................................................................................. 47
Figure 23: Flood prone areas in RA 1 .................................................................................................. 49
Figure 24: Wall embankment in RW 04............................................................................................... 50
Figure 25: Evacuation maps of RW 04 and RW 05 ............................................................................ 51
Figure 26: Brownfield in the southwest area of RA 06 ..................................................................... 53
Figure 27: Small Business for daily needs in RW 04 ......................................................................... 55
Figure 28: Weathered gabion, affected by last rain in RW 05 ............................................................ 57
Figure 29: Implemented strategies inside RA 1 .................................................................................. 58
Figure 30: On left side continuous wall embankment of RW 03;
    RW 13 behind bridge ..................................................................................................................... 63
Figure 31: Vertical housing in the west;
    slope-stabilising structure of RW 14 in the east ......................................................................... 63
Figure 32: Location and basic facilities of RA 2 ............................................................................... 65
Figure 33: Wall embankment in RW 02 .............................................................................................. 67
Figure 34: Flood prone areas in RA 2 .................................................................................................. 68
Figure 35: Destroyed pedestrian bridge in RW 14 ............................................................................ 69
Figure 36: Prepared sandbags in RW 03 ............................................................................................ 70
Figure 37: Slope-stabilising structure in RW 14 ............................................................................... 71
Figure 38: Implemented strategies inside RA 2 .................................................................................. 76
Figure 39: Dense settlement structures of RW 01 ................................................................. 81
Figure 40: Hotel PUTRA SABAR in RW 01 ........................................................................... 82
Figure 41: Location and basic infrastructure of RA 3 .......................................................... 84
Figure 42: Flood prone areas in RA 3 .................................................................................. 85
Figure 43: Traditional early warning Instruments ............................................................... 86
Figure 44: Wall embankment in RW 02 ................................................................................ 87
Figure 45: Implemented strategies inside RA 3 .................................................................... 89
Figure 46: Percentage of newcomers and local people (all RAs)......................................... 92
Figure 47: Duration of being in business (all RAs) .............................................................. 93
Figure 48: Typical Indonesian general store ......................................................................... 93
Figure 49: Branches of trade in RA 1 ................................................................................... 94
Figure 50: Branches of trade in RA 3 ................................................................................... 94
Figure 51: Number of employees (all RAs) ....................................................................... 95
Figure 52: Correlation between kind of business and number of workers (all RAs) .......... 95
Figure 53: Perceived satisfaction with business success (all RAs) ..................................... 96
Figure 54: Perceived satisfaction with business success in RA 2 ....................................... 96
Figure 55: Perceived exposure to natural hazards (all RAs) .............................................. 97
Figure 56: Necessity of protection against natural hazards (all RAs) ................................ 98
Figure 57: Correlation between commercial success and different natural hazards (all RAs) ................................................................................................................................................. 100
Figure 58: Correlation between commercial success and arrangements for protection (all RAs) ................................................................................................................................................. 101
Figure 59: Correlation between commercial success and years of being in business (all RAs) ................................................................................................................................................. 101
Figure 60: Correlation between kind of business and years of being in (all RAs) ............. 102
Figure 61: In- and outbound migration in Surakarta .......................................................... 118
Figure 62: Population Density in Surakarta (2012) .............................................................. 119
Figure 63: Areas in Solo threatened by Flooding .................................................................. 121
Figure 64: Schematic presentation of the relocation process ............................................ 122
Figure 65: Old settlement and relocation area in Surakarta .............................................. 123
Figure 66: Aerial view of Pucang Sawit (2008 and 2014) .................................................. 125
Figure 67: Aerial view of Mojosongo (2008 and 2014) ...................................................... 126
Figure 68: Overview of parties involved in the relocation process and their tasks .......... 127
Figure 69: The sustainable livelihoods framework ............................................................ 130
Figure 70: Perceived access to medical care in comparison .............................................. 133
Figure 71: Perceived access to educational institutions in comparison ............................ 133
Figure 72: Household based businesses ............................................................................. 134
Figure 73: Comparing social networks between Pucang Sawit and Mojosongo .............. 135
Figure 74: Areas used for gardening in Mojosongo ............................................................ 136
Figure 75: Landfill area with chicken shacks (right-hand foreground) .............................. 137
Figure 76: Modifications to houses since moving in ........................................................... 138
Figure 77: “Other” types of modifications ........................................................................... 138
Figure 78: Unmodified house in Mojosongo ...................................................................... 139
Figure 79: Modified two-storied building with balcony in Mojosongo ............................ 139
Figure 80: Comparison of housing quality ................................................................. 140
Figure 81: Comparison of basic infrastructure .......................................................... 141
Figure 82: Change of the monthly household income due to relocation ...................... 142
Figure 83: Changes in monthly household expenditures due to relocation .................. 142
Figure 84: Interview with a relocated woman in Mojosongo ....................................... 146
Figure 85: Satisfaction with the relocation process .................................................... 148
Figure 86: General reasons for being satisfied with the relocation process .................... 149
Figure 87: Most prominent reasons for being satisfied with the relocation process ....... 150
Figure 88: Areas of improvement regarding the outcomes of the relocation process ...... 153
Figure 89: Different states of house improvements in Mojosongo .............................. 153
Figure 90: Starting points to improve the relocation process .................................... 154
Figure 91: Remaining settlement in Pucang Sawit with dyke on the right hand side ...... 157
Figure 92: Interview at the Office for Land Title Authorities ..................................... 158
Figure 93: Assessment of the relocation process by relocated families and local experts ............................................................... 161
Figure 94: The riverbank in Pucang Sawit (2006) ....................................................... 163
Figure 95: The riverbank in Pucang Sawit (2013) ......................................................... 163
Figure 96: Land use of Pucang Sawit riverbank .......................................................... 164
Figure 97: Schematic procedure of analysis ............................................................... 165
Figure 98: A waste burning hole in the newly built park ............................................. 167
Figure 99: Newly installed early warning system on the dyke .................................... 167
Figure 100: The riverbank of Pucang Sawit during Perahu Gethek Bengawan festival .... 168
Figure 101: The chain of effects regarding physical capital ........................................ 169
Figure 102: Mango field situated in the east of the newly built park ............................ 170
Figure 103: The chain of effects regarding financial capital ........................................ 171
Figure 104: The new riverside park in Pucang Sawit .................................................... 172
Figure 105: Waste oil storage on the Pucang Sawit riverbank ..................................... 174
Figure 106: The chain of effects regarding natural capital .......................................... 175
Figure 107: The chain of effects regarding human capital .......................................... 177
Figure 108: Vandalised meeting point in the Pucang Sawit riverside park ..................... 178
Figure 109: The chain of effects regarding social capital ............................................ 180
Figure 110: Exemplary connection between parties, interests, positions and an issue at stake ..................................................................................................................... 183
Figure 111: Interests and the positions in context of the resettlement ............................ 186
Figure 112: Subpositions of governmental agencies to provide households with basic needs ....................................................................................................................... 190
Figure 113: Subpositions of resettled households ....................................................... 190
Figure 114: View through the valley-shaped settlement of Mojosongo ........................ 193
Figure 115: Fulfillment of governmental and household interests ............................... 194
Figure 116: Connections between the four research questions ................................... 195
1. Introductory remarks

The diverse processes of global change, ongoing urbanisation and subsequent far-reaching changes of societal and spatial structures are major challenges global population has to face. Urban growth is among the major challenges that particularly developing countries have to deal with. A growing part of urban population is living in areas at risk, likely to be exacerbated by environmental deterioration or climate change impacts. Questions of enhancing urban resilience to natural hazards are therefore gaining importance. This is particularly for poorer and therefore often more vulnerable households of relevance: Since formal risk reduction strategies are often absent for informal settlers community-based approaches to enhance resilience can have a significant impact.

Indonesia is among the countries where such strategies are of utmost importance. The multi-island country is prone to different natural hazards, in particular earthquakes, volcanic eruptions and tsunamis, as well as landslides and floodings. It ranks number four on a global scale in terms of population, with the island of Java as the most densely populated part of the country. Here, risk-sensitive development of the still growing urban agglomerations is crucial as a large share of the population is prone to multiple risks.

As a science intrinsically linked to space, geography seeks to document and analyse such problems to come up with integrated development strategies. This publication presents the outcomes of such a process, created by ten students of the Master degree programme ‘Global change – regional sustainability’ at the Institute of Geography, University of Innsbruck.

Within this programme students have to select two out of four elective areas, depending on their research interests. This report presents the results of the three-semester elective area ‘Development research’. It was compiled by ten Master students who have worked on it throughout three semesters, supervised by Martin Coy, Karl Michael Höferl and Simone Sandholz at the Institute of Geography. The report is based on the results of a field research which the group has carried out in the cities of Yogyakarta and Surakarta, on the island of Java, Indonesia.

Both cities are exposed to natural hazards and have developed different coping strategies. Therefore, two case studies were selected. In Yogyakarta (c.f. Figure 10) riverine communities are prone to flooding and lahar floods from Merapi Volcano. At the same time urban growth and economic development have led to high urban density and a lack of building plots. The research therefore tried to investigate how local communities deal with natural hazards and socio-economic processes influencing local development. Three communities along a Code River transact were chosen as case studies. The major aim for the field research was to identify, analyse and compare endogenous potentials of these communities to cope with socio-economic development processes and natural hazards.

In Surakarta (also known as Solo, c.f. Figure 10) a hazard-driven community relocation programme was evaluated within the field research approach ‘EvalAdapt – Evaluating
adaptive Governance’. In recent years, Surakarta gained recognition for its resettlement programmes to relocate informal settlements affected by natural hazards, particularly floods. Therefore research aimed to evaluate the influence of the relocation on resettled households and communities still living around the former settlement area.

The research approaches and methodologies were elaborated by the students themselves. After gaining an overview on Indonesia – including history, natural environment and hazards as well as sociocultural and economic aspects in general – the urban- and socio-economic development of Yogyakarta and Surakarta was discussed in detail. Based on these profound insights, a research methodology was developed. For both case studies students developed a detailed research design discussed it with their supervisors in Innsbruck and with Indonesian experts that supported the field research. In the second of three semesters a three-week field research took place, from 16th September to 5th October 2014 (c.f. Table 1).

The students worked independently and self-organised, together with students from local universities, using a mix of qualitative and quantitative methods. Necessary adjustments and further steps were discussed during daily group meetings. In Yogyakarta field work was conducted in close cooperation with the Faculty of Geography of Universitas Gadjah Mada (UGM), a long-term university cooperation partner of the University of Innsbruck. As part of their UGM Geography Master Programme ten Indonesian students carried out the field work together with the Austrian students. Thanks to the excellent support and supervision of Dr. Dr. Dyah Rahmawati Hizbaron and M.Sc. Surani Hasanati, and the kindness of Prof. Dr. Aris Marfai, Dr. Djati Mardiatno, long-standing friends of UIBK Prof. Dr. Junun Sartohadi, Dr. Anggrí Setiawan and their team to share their expert knowledge, many data could be collected by the Austrian-Indonesian student team.
<table>
<thead>
<tr>
<th>Timeframe</th>
<th>Action</th>
<th>Location</th>
</tr>
</thead>
<tbody>
<tr>
<td>16. - 17. Sep. 2014</td>
<td>arrival, final preparation of the field work, initial meeting with Indonesian students and lecturers, first visit of research areas and group distribution</td>
<td>Yogyakarta</td>
</tr>
<tr>
<td>18. - 20. Sep. 2014</td>
<td>field work in subgroups, in-depth analysis of research areas including own surveys, questionnaires and interviews, daily group meetings to reflect and adjust field work</td>
<td>Yogyakarta</td>
</tr>
<tr>
<td>25. Sep. 2014</td>
<td>presentation of preliminary results at UGM, done jointly with Indonesian students, feedback round and outlook on data analysis</td>
<td>Yogyakarta</td>
</tr>
<tr>
<td>26. Sep. 2014</td>
<td>travel to Surakarta, visit of research area, pre-test of questionnaire for community members</td>
<td>Surakarta</td>
</tr>
<tr>
<td>27. Sep. - 1. Oct. 2014</td>
<td>field work, site visits and questionnaires, expert interviews, daily group meetings to reflect and adjust field work, evaluation of preliminary results</td>
<td>Surakarta</td>
</tr>
<tr>
<td>2. Oct. 2014</td>
<td>presentation of preliminary research results at UNS, podium discussion, travel back to Yogyakarta</td>
<td>Surakarta/ Yogyakarta</td>
</tr>
<tr>
<td>3. Oct. 2014</td>
<td>excursion to Merapi Volcano, visit of Lahar sites and sand mining activities</td>
<td>Yogyakarta</td>
</tr>
<tr>
<td>4. - 5. Oct. 2014</td>
<td>wrap-up, outlook and farewell</td>
<td>Yogyakarta</td>
</tr>
</tbody>
</table>

Table 1: Schedule of field work in Indonesia  
(own table, 2015)

After presenting the preliminary research results and necessary further steps, the ‘Team-Innsbruck’ (c.f. Figure 1) moved on to the city of Surakarta (Solo). Here the field work was supported by staff and students of Universitas Sebelas Maret (UNS), with particular support of Dr. Nurhadi, MA Yosafat Hermawan Trinugraha, Dr. Winny Astuti and Dr. Gamal Ridarjono. Again, a final presentation of preliminary results was done, this time in form of a podium discussion, before concluding the field research. Data analysis and final reporting was done after having returned to Austria.

The next chapters present the outcomes of this three-semester elective area ‘Development research’, starting with a general overview on Indonesia. Subsequently, both case studies – Yogyakarta and Surakarta – and their outcomes will be presented in detail.

Finally, the authors would like to express their deepest gratitude to all Indonesian students, lecturers and experts that have supported their fieldwork. This elective area ‘Development research’ was a truly unique, demanding but also enjoyable experience for all involved, establishing friendships on top of academic cooperation and research.
2. Indonesia – a geographical overview

The Republic of Indonesia is a sovereign state in Southeast Asia which is situated between the Indian Ocean and the Pacific Ocean. The equatorial archipelago is the biggest archipelago in the world with an area of 1.9 million km². Indonesia consists of 17,508 islands and about 6,000 of them are inhabited (CIA Factbook 2014). The major islands are Bali, Flores, Java, Kalimantan, Lombok, New Guinea, Sulawesi, Sumatra and Timor. Indonesia is stretched out over about 1,800 kilometres north to south whereas the west-east expansion is about 5,100 kilometres. The border countries of Indonesia are Malaysia (border line of 1,881 kilometres on Kalimantan), Papua New Guinea (border line of 824 kilometres on Papua) and Timor-Leste (border line of 253 kilometres on Timor).

Concerning geological age, the Indonesian archipelago is a young region. Most of the islands were formed in Tertiary by orogenic movements, whereas the oldest parts of Indonesia were formed during the Perm (Zimmermann 2003: 12). These movements were caused by subduction of the Indo-Australian plate and the Pacific plate under the Eurasian plate, so
huge rock masses were uplifted. The highest mountain ranges are situated in Sumatra (Barisan mountains), Kalimantan (Capua mountains) and New Guinea (Maoke mountains). The Puncak Jaya, which is the biggest mountain in Indonesia, is situated in the Maoke mountains and has about 4,884 metres. Due to the fact that Indonesia is part of the pacific ring of fire (also called as the circum‐pacific seismic belt) and the region is still tectonically active, the mountain ranges (and the archipelago as well) consist of numerous volcanoes. Of the three hundred volcanoes that are known, 129 of them are active (Glaser & Kremb 2007: 227). The most popular volcanoes are Merapi (Java), Krakatoa (on the islands Krakatoa) and Tambora (Sumbawa).

2.1 Climate and vegetation
Indonesia is situated close to the equator, therefore most of the archipelago is influenced by the so‐called ‘Af climate’ (equatorial rainforest, fully humid). Characteristics of an ‘Af Climate’ are the month medium temperature (above 18 °C), all months have an average precipitation of at least 60 millimetres and there is a big change in temperature between night and day (bigger than the average change in temperature within a year) (Kottek et al. 2006: 260; Zimmermann 2003: 6). The monsoon also has an impact on the country. There are two seasons: rainy season and dry season. Some parts of south Sulawesi, Java and Papua are located in the ‘Am climate’ (equatorial monsoon), which means that the driest month has less than 60 millimetres, but more than 25 millimetres. (Kottek et al. 2006: 260p.). Yogyakarta and Surakarta, which are situated in Central Java, are located in the ‘Am climate’ as well. Eastern Java, Bali, Lombok, Flores, Sumbawa, Timor and the southern parts of Papua are influenced by the ‘Aw climate’ (equatorial savannah with winter dry).

The lowlands of Indonesia, which are located within the ‘Af Climate’, are dominated by Evergreen rainforests. They are also indicated by high biodiversity (Schultz 2008: 329). In some coastal areas of Sumatra, Kalimantan, Papua, Sulawesi and Java mangrove forests can be found. At the transition from the lowlands to cloud forest, not only chestnut forests can be found, but also oak forests and laurel plants (Zimmermann 2003: 20p.). The alpine zone, which can be found in the Maoke Mountains, can be identified by knee timber as well as bogs and lichens. The ‘Af Climate’ is mostly characterised by Ferralsol and Acrisol (Schultz 2008: 324). In the case Indonesia the soils prevailing are dominated by Acrisol. Due to intense chemical weathering, the soils are nutrient‐poor. This procedure is accelerated not only by high temperature, but also by soil acidity and soil moisture penetration. The weathering decreases with increasing altitude. Because of the prevailing volcanoism, soils are fertile in Indonesia due to the accumulation of ash by volcanic eruptions, what is beneficial for agriculture.

2.2 Natural hazards
As a result of the geodynamic and geomorphologic processes, Indonesia is vulnerable to natural hazards. The most dangerous natural hazards are volcanic eruptions, earthquakes, floods, landslides and tsunamis. From 2004 to 2009 about 3.5 million buildings have been damaged or destroyed (World Bank 2012: 21). Approximately 70% of the buildings were affected by earthquakes or tsunamis, whereas about 25% of the buildings were affected by floods or landslides in this period. This chapter discusses natural hazards closer. A few selected natural phenomena will be discussed as well, which should show their impact on Indonesia.

Due to climatic conditions, heavy rains are likely to at short notice. The annual precipitation sum of the islands is about 2,000 to 4,000 millimetres; 50 millimetres per day are possible and rain showers are short and intense (Schultz 2008: 321). The rest of the archipelago is influenced by the monsoon, so they have a dry season and a rainy season. Yogyakarta and Surakarta are also located within the area of influence of the monsoon. During the rainy
season the precipitation sum is about 500 to 1,500 millimetres (Schultz 2008: 293p.). Because of these influences, floods and inundations can occur during heavy rains. As a consequence of heavy rainfall, rivers can overflow their banks and compromise the settlements which are located near. If the ground is not able to absorb the whole precipitation, surface runoff is likely to happen. Due to heavy rains the soil also can become unstable. This instability can lead to mudslides and landslides. Settlements, which are located near slopes, are particularly vulnerable due to heavy rains.

Geodynamic processes pose another danger for Indonesia’s inhabitants. As mentioned before, Indonesia is surrounded by the pacific ring of fire. Due to this situation, earthquakes, tsunamis and volcanic eruptions are very likely to happen. One of the most active volcanoes is the Merapi which is situated in Central Java close to the cities Yogyakarta and Surakarta. In the last 450 years the Merapi erupted on average every seven years (Glaser & Kremb 2007: 228). Not only pyroclastic flows, but also lahars caused by heavy rainfall can be a threat to the people who live near Merapi. The latest eruption took place in 2010. About 367 people were killed during the eruption and 277 were injured. Because of the intensive observation and modern monitoring methods about 10,000-20,000 lives have been saved (Surono et al. 2010: 123). Volcanic eruptions also can have a big influence on regions that are far away from the volcano. The Tambora, which is situated on the island Sumbawa, erupted in 1815. It was the world’s greatest ash eruption since the end of the last Ice Age (Stother 1984: 1191). About 80,000 people died from direct or indirect effects in Indonesia. In 1816 it also had an impact on the Europeans and North Americans as well. This year is also known as a ‘year without a summer’ (Stother 1984: 1196). In some parts of the northern hemisphere, this global climatic change led to crop failure and the mortality amongst farm animals increased too. The eruption in 1815 caused the biggest hunger crisis in the 19th century.

Indonesia is mostly situated on the Eurasian plate, whereas the island Papua is situated on the Australian plate. Due to the fact that the plates, which surround Indonesia, are converging, heavy earthquakes are probable.

One of the strongest earthquakes took place on 26th December, 2004 off the coast of Sumatra. The hypocentre of the earthquake was located about 30 kilometres off Sumatra’s North coast. The magnitude was about 9.2 according to the Richter scale. That strength correlates with more than 1,800 megatons TNT (Grotzinger et al. 2008: 341). The rapid movement at the seafloor, caused by an earthquake, brings forth a water wave which led to a tsunami. The wave grew in shallow coastal regions. The maximum height of the wave was about 15 metres at the beaches, but when the tsunami hit the emerged land the height of the wave rose from 25 to 35 metres (Grotzinger et al. 2008: 352). The tsunami also destroyed most of the buildings and a bigger part of the vegetation 2 kilometres inland. Indonesia was not the only country affected by the disaster. After the earthquake it took the tsunami two hours to reach the coasts of Sri Lanka and Thailand, three hours to India, four to the Maldives and nine hours to the coast of Somalia (Grotzinger et al. 2008: 352). Due to the reason that there was no early warning system a lot of people died in these countries. Altogether the tsunami took the life of 280,000 people.

2.3 History

The islands Sumatra, Java and Kalimantan belonged together 500,000 years ago. Before the sea level began to rise during the Holocene, it was possible to reach the Sunda region – including Malay Peninsula, Sumatra, Java and Kalimantan – overland (Zimmermann 2003: 15p.). The first humanoid beings reached Java about 1.5 million years ago. They also reached the island Flores which was never connected with the Sunda region (Taylor 2003: 5; Zimmermann 2003: 30).

When the first human societies arose in Indonesia about 40,000 to 60,000 BC, their main activities were hunting, manufacturing objects and they also started agriculture (Dahm 1979:}
The first agrarian societies were probably cultivating millet. The first immigrants came from South China between 2,000 and 2,500 BC and brought rice to the region (Zimmermann 2003: 32; Taylor 2003: 7). The mountainous regions between 400 and 1,000 metres altitude were particularly preferred because of the fertile soil which was suitable for agriculture. When the sea level began to rise during the Holocene, the people were forced to use boats to reach the islands. The regions around the Strait of Malacca and the islands Bali and Java became commercial centres in the 1st century BC (Zimmermann 2003: 37). Spices like nutmeg, clove and pepper, but also fruits, wild honey, gold jewellery and pearls were very popular among Chinese and Indian sailor-traders (Dahm 1979: 68; Zimmermann 37).

In the 5th century AD the relationship between India and the archipelago intensified. Hinduism spread in Sumatra, Kalimantan, West-Java, Bali and Sulawesi (Dahm 1979: 69; Taylor 2003: 15-21; Zimmermann 2003: 38). The kingdom Srivijaya, which was situated in the Southern part of Sumatra, became the strongest power and controlled the maritime trade. Meanwhile in Central Java the Sailendra dynasty began to rise. In contrast to Srivijaya, they were influenced by Buddhism. During their leadership, the temple Borobudur was built near the present city of Yogyakarta. In parallel the Hindu-kingdom Mataram existed in Central Java. To honour their Hindu gods, they built the temple Prambanan which is also situated near Yogyakarta (Dahm 1979: 71; Zimmermann 2003: 41p.). Both kingdoms were replaced by the kingdom Majapahit which stretched from Sumatra and the Malacca peninsula to Papua.

The political system of the Javanese kings was structurally unstable, so it was easy for peripheral regions to separate from the kingdom (Zimmermann 2003: 51). At the beginning of the maritime trade Arabian and Persian traders were involved and they brought the Islam to the North of Sumatra. The Islam spread over Indonesia gradually. The kingdom Majapahit was afraid to lose control of the region, because their leader believed in Hinduism. Finally, in the 15th century they lost control of the region, so the Sultanate of Malacca became the biggest power in the archipelago. In 1511, after the change in leadership, the Portuguese discovered and conquered the region (Dahm 1979: 78; Taylor 2003: 116; Zimmermann 2003: 57). At the end of the 16th century the Chinese, Arabian, Indian and Japanese built emporia. The Dutch were the next colonial power who arrived in 1596 in Banten in Western Java. They signed a friendship treaty with the Sultan of Banten. In order to extend their influence in the trade, the Dutch founded the VOC (Vereenigde Oostindische Compagnie - Dutch East India Company). Their first base was situated in Ambon at the Maluku islands, which were conquered in 1605. The Dutch expelled the other Europeans with brutal methods of the archipelago, locals were mistreated and massacred (Dahm 1979: 79; Zimmermann 2003: 60).

The VOC relocated their headquarters to Batavia (which is nowadays known as Jakarta), and they also extended their influence to Sri Lanka, the peninsula Malacca and Japan. The Dutch began to interfere in local politics in order to get many estates in Java. Meanwhile Batavia became a reloading point for spices (e.g. pepper, clove, nutmeg, and cinnamon from Sri Lanka), Chinese tea, silk, cotton, porcelain and copper from Japan. Coffee also became an important product of the region which was cultivated in West Java. The coffee, which was imported from India, grew very well in the mountainous regions of Preanger, which is situated in West Java. The Javanese farmers never had cultivated coffee before. Therefore the success of the experiment was due to their abilities. The VOC wanted to secure its power, so the kingdom of Mataram was divided into two parts, Surakarta and Yogyakarta (Dahm 1979: 82; Taylor 2003: 192p.).

At the beginning of the 20th century, the Dutch extended their influence towards Bali, Kalimantan. In this period several political movements were formed to put the Dutch colonial power under pressure, also Javanese students were demanding for a better educational system and infrastructure (Dahm 1979: 89p.; Zimmermann 2003: 89). When the economic crisis hit Indonesia at the end of the 1920s criminal law was tightened to avoid rebellions.
The political activists Sukarno, Sjahir and Hatta were arrested in 1933, but the people were still aiming to achieve independence (Dahm 1979: 93p.). In 1942 the Japanese defeated the Dutch. They were interested in workers and raw material deposits. Soon the people were unsatisfied with the Japanese leadership. Sukarno, Sjahir and Hatta were set free to calm down the situation. The Japanese Prime Minister also promised that Indonesia would become independent (Dahm 1979: 96; Taylor 2003: 321; Zimmermann 2003: 240). After many negotiations Indonesia finally became independent on the 17th September in 1945. The proclamation was declared by Sukarno and Hatta. After a war against the Dutch (from 1945-1949; supported by the British) the sovereignty of the territory of the Dutch East Indies was transferred to the Republic of Indonesia on the 27th December, 1949 (Dahm 1979: 103; Zimmermann 2003: 241).

The 1950s were very difficult for Sukarno who became the first president of Indonesia. On the one hand his party had no certain economic programme, but on the other hand his dream of a united republic did not become reality. The economy was still dominated by the Dutch. Meanwhile the Republic was hit by several disruptions. Also breakaway movements occurred in Sumatra, Sulawesi and Ambon (Taylor 2003: 340-346). The communist party, which was founded in 1920, gained popularity over the years. Although the communists were successful in elections, communist politicians were not appointed to political offices, because the established parties feared a loss of power.

The pressure on Sukarno began to grow, so he suspended the civil law in 1957 and in 1960 the parliament was dissolved. Instead of the civil law the armed forces ruled the state (Taylor 2003: 355). Finally, in 1965 the situation escalated. Sukarno’s presidential guard made a grab of power, so they seized control of the national radio, generals who commanded the army were rounded up and murdered later and a programme has been announced to save the nation from corruption (Taylor 2003: 356). General Suharto, who became president, put down the revolt and brought Jakarta regiments under his authority (Taylor 2003: 357). Suharto’s faction launched a propaganda campaign which called the 30th September Movement Gestapu (Vickers 2005: 156). The campaign reported that the movement belonged to the Communist Party, so a connection was created between the party and coup.

Sukarno, who withdrew from office, was held under house arrest until his death in 1970. Suharto made economic development the nation’s goal in the 1970s and 1980s (Taylor 2003: 357). During this period Bali and Java were haunted by massacres. About 800,000 were murdered during this period and about 250,000 were put into so called detention sites. Suharto was pursuing the so called New Order policy (Taylor 2003: 362). The New Order policy, which was based on the Five Principles (also Five Pancasilas), replaced Suharto’s Guided Democracy policy (Vickers 2005: 161). Beside the constitution, the Five Principles became the most important element of the nation. During his presidential term the improvement of the education system and economic development became very important. Primary, secondary and private schools were established and government buildings were constructed in the provincial capitals (Taylor 2003: 362; Vickers 2005: 184). By reason of drilling for oil and the Green Revolution Indonesia’s economy continued to grow. The new varieties depended on heavy use of fertiliser and insecticides and became increasingly more important for the structure of rural economies, but the ecologies of the islands suffered due to this development (Vickers 2005: 189).

The political situation continued to be strained during Suharto’s thirty years of leadership. Provinces like Aceh, Wet New Guinea, Iriau, Kalimantan and East Timor were demanding independency (Taylor 2003: 366; Vickers 2005: 217-220). Due to the fact that the Cold War ended in 1989 when the Soviet Union fell apart, Suharto had to change his policy at the end of his leadership. In the middle of the 1990s there were two events which weakened his
power: First, a new movement began to rise which was led by Megawati, Sukarno’s daughter. Her new party, called Indonesian Democratic Party of Struggle (PDI-P), gained popularity among the poor and dispossessed people (Vickers 2005: 202). Second, the economic situation was getting worse.

The country’s commercial crisis was caused by the e...
### 2.5 Recent administrative policies and population development

Since 2001 the number of provinces increased from 26 to 33 (Zimmermann 2003: 250). The number of provinces changed due to a policy rethinking. After Suharto withdrew from presidential office due to the country’s financial crisis, Indonesia had to rely on the help of international organisations. Not only to stabilise the country financially, but also to push the country ahead for political changes (e.g. the provinces Aceh, East Timor and Papua were demanding for independency). The World Bank and the International Monetary Fund (IMF) were consulted throughout the drafting of two laws passed in 1999 on decentralisation, or regional autonomy (Otonomi Daerah), as it is called in Indonesia (Miller 2013: 834). These two laws gave the autonomous regions chances as well as tasks. Because of Suharto’s policy the central government received 80% of the budget, the remaining 20% were allocated to the provinces, districts and villages (Zimmermann 2003: 251). As a result of the decentralisation policy the power was transferred from the central government in Jakarta to the local governments. Now, on the one hand, they have more financial resources, on the other side, though, this means also more responsibility (Shima et al. 2006: 4; Firman 2010: 400). The decentralisation programme had another side effect. Because of separatist movements in provinces Aceh, West New Guinea and East Timor, Indonesia threatened to fall apart, but the new policy kept the republic alive, with the exception of East Timor that became independent in 2002. That new political approach was the largest decentralisation programme in the world (Miller 2013: 835).

---

**Figure 3: Administrative structure of Indonesia**

(own figure, based on: Bawole 2007; BPS 2015; Obermayr 2017: 78)
Since the beginning of the 1980s the population growth rate of Indonesia began to decrease continuously. The population growth rate on the island Java decreased as well (c.f. Figure 4). In 2015 Indonesia had more than 255 million inhabitants (BPS 2015). During the last 30 years the population grew by more than 100 million people. In 2035 Indonesia will have more than 300 million inhabitants, but the rapid growth of population will decrease in the next decades. Java has nearly 150 million inhabitants, which means that about 57% of Indonesia’s population live on Java. Compared to Java, the bigger islands like Sumatra, Kalimantan, Sulawesi and Papua are less densely populated.
Nowadays Java is the most densely populated island in Indonesia (c.f. Figure 5). Java was densely populated even during the colonial period (Zimmermann 2003: 311). To cope with the overpopulation, the Javanese population was resettled to other islands (Vickers 2005: 193; Zimmermann 2003: 311). After the independency the resettlement programme, which was called Transmigrasi, was continued by the Indonesian government. In 1952 Java had about 54 million inhabitants, so the main goal was at first to minimise the number of population to 31 million until 1987. This ambitious plan could not be put into practise, because only nearly 27,000 people were resettled until 1973. This was because the programme was based on voluntary action (Bleichschmidt, Eck & Goetz 2010: 52; Zimmermann 2003: 311). The resettlement programme was aimed mainly at landless farmers and unemployed city dwellers. To make a resettlement attractive for the target groups, incentives had been set. The resettled families received two hectares land, including a house, food for one year and seeds (Bleichschmidt, Eck & Goetz 2010: 52; Zimmermann 2003: 311). Another aspect was that the programme was trying to reduce the spatial disparities in Indonesia. The Transmigrasi programme was the largest state resettlement programme worldwide (Bleichschmidt, Eck & Goetz 2010: 52).

From 1905 until 1996 more than 5.5 million Indonesians have been resettled (Bleichschmidt, Eck & Goetz 2010: 53). However, even though the programme had quite positive effects, it also had negative ones. The resettled people were sent to regions that were largely covered by rainforest. In order to create a living space, the rainforest was severely cut down. Therefore, indigenous peoples lost their land rights and living space as well (Bleichschmidt, Eck & Goetz 2010: 52). Farmers, who wanted to build a new future with the aid of the project, were mostly impoverished, so they moved either to the next city or back to their original homeland.

### 2.6 Economy

Indonesia plays an important role in the global economy. It is a member of important regional and global organisations like the G20, ASEAN, APEC and ASEM. From 2000 to 2012 its economy grew on an average of nearly 5.4 % annually (BPS 2015). In contrast to other newly industrialising countries, Indonesia’s economy is growing more constantly. Figure 6 shows the GDP growth rate of newly industrialising countries as well as industrialised countries. From 2008 to 2010, economic growth fell worldwide due to the global financial crisis. Indonesia is also part of the so called MINT-states (Mexico, Indonesia, Nigeria and Turkey).

Over the last decades the structure of Indonesia’s economy has changed completely, which is also connected to Suharto’s New Order policy. In 1965, the proportion of the primary sector in GDP was still at 53%, but in 2014 the proportion was 14%, whereas the secondary and the tertiary sector increased (BPS 2015; Zimmermann 2003: 342).

Indonesia’s primary sector is still an important part of the economy, although the proportion of the primary sector has decreased during the 20th century. Since the colonial era, innumerable plantations were built to cultivate goods as coffee and tea. Since the 1950s the crop area has increased continuously (Zimmermann 2003: 355). Important products are rice, maize, tobacco, sugar cane, cocoa and coffee. The bigger part of Indonesia’s food production is turned out in Java and Sumatra. Over the last 20 years another product became more important: oil palm. The products of the oil palm (crude palm oil, palm kernel) have become more important than sugar cane or coffee (BPS 2015). The oil palm plantations can be found mostly on Sumatra, Kalimantan, Sulawesi and Papua, but still the biggest part of the production is concentrated on the islands of Sumatra and Kalimantan. In order to establish plantations, tropical rainforests have been cut down. Approximately 3.9 % to 10.5 %, about eight million hectares, of total deforestation in Indonesia can be ascribed to the expansion of oil palm plantations (Ramdani, Moffiet & Hino 2014: 189).
Due to geological and geodynamical processes, Indonesia is rich in mineral deposits (Schmidt 1979: 9-13). Sultans and the VOC tended to find other deposits (Zimmermann 2003: 386). The most important minerals are gold, silver, tin, bauxite, copper, iron sand, granite, manganese ore and nickel (BPS; Zimmermann 386p.). Also diamonds have been found in the archipelago, but nowadays they are extracted only in small quantities. Coal, gas and oil are important raw materials for the power industry. From 1996 to 2012 the coal production rose from 50 million tons to nearly 470 million tons (BPS 2015). The state is directly involved in the power industry. The companies Tambung Batubara and Pertamina are owned by the government (Zimmermann 2003: 393). They are not only responsible for coal extraction (mostly in Sumatra and Kalimantan), but also for oil and gas production. The most important products are crude oil, fuels as well as gas (BPS 2015).

As mentioned before, Indonesia’s economy is focused on the export of raw materials and minerals. Therefore the foreign trade plays an important role for the tertiary sector. Another important part of the tertiary sector is tourism as well. Over the last decades inbound tourism increased as well as domestic tourism. From 1999 to 2013 the number of foreign tourists increased from nearly four million to about nine million people (BPS 2015; Zimmermann 2003: 419). About 80% of the visitors come from Asian countries and approximately 20% come from Europe. For a long time the airport of Jakarta was the most important place of arrival, but over the years the airports of Denpasar, Medan, Padang, Makassar and Tarakan have gained importance, too. This development was promoted not only by renovations of the airports, but also due to the fact that the aircraft became a mass transportation (Zimmermann 2003: 429). Although inbound tourism doubled since 1999, domestic tourism increased as well. The number of Indonesians increased from 36 million in 2003 to nearly 80 million in 2013 (BPS 2015).
2.7 Urban development in Indonesia

2.7.1 Historic development

As mentioned before, Indonesia has about 250 million inhabitants. Between 1960 and 2009 the population grew at a rate of just under 1.9% (Blane 2014: 194). In 1960 17.1% of Indonesia’s population lived in cities, whereas in 2015 the portion of urban population increased to 53.3% (Blane 2014: 194; BPS 2015). During the last decades Indonesia has developed from a largely rural country to a mostly urban one in less than two generations (Blane 2014: 194). From 1960 to 2009 the urban population grew at a rate of 4.6% per year. Although the portion of rural populations decreased, Indonesia still had the largest rural population worldwide in 2005 (Miller 2013: 836). It is estimated that Indonesia’s urban population will still grow. It is expected that 66.6% of Indonesia’s population (or over 200 million people) will live in cities in 2035 (BPS 2015).

About 54% of Indonesia’s population are living on Java. Although Java is not the biggest island in the archipelago, it is the most densely populated island (c.f. Figure 5). Also the portion of urban population is high. About 66% of Java’s population live in cities (BPS 2015). The most familiar cities on Java are, beside Jakarta, Yogyakarta, Semarang, Surabaya, Surakarta, Bandung and Bogor.

From the prehistoric era until the 4th century two, different kinds of kingdoms were developed: either they were situated closely to the coast or situated in the interior (Zahnd 2005: 15p.). After the first Islamic empire was established in the North of Sumatra in the 13th century, some rulers of the empires converted to Islam because they wanted to get a commercial advantage. Islam became rapidly and clearly an important cultural and religious component in Java (Zahnd 2005: 35). During this era Chinese sailors began to build settlements, because they had to wait for the monsoon winds (Dahm 1979: 74p.; Zahnd2005: 35). Until the 16th century the number of Chinese settlers rose continuously.

The colonial era of the Dutch respectively of the VOC also strongly influenced Java. When the Dutch extended their territory, Java became a military centre as well as an economic and political one. In the 19th century the Dutch began to improve the infrastructure. A country road through Central Java, to improve the accessibility of the island, and a railway between Semarang and Yogyakarta were built (Zahnd 2005: 41). Also the Dutch pushed forward the construction of big industrial plantations. The farmers were forced to give 40% of their harvest to the Dutch, so many farmers moved to cities, because they were looking for other jobs. During this period the coastal cities were growing rapidly.

After the independency of Indonesia in 1945, the rural population began to decrease. During the leadership of Sukarno, Jakarta became the capital of Indonesia. From 1945 to 1949 Yogyakarta was the capital city. Sukarno wanted to create a new identity of an upcoming nation, hence Jakarta should symbolise modernity and the new centre of Indonesia (Zahnd 2005: 47p.). When Suharto became president in 1965, he changed the policy. He focused on a new traditionalism and believed by returning to native roots, the citizens of Indonesia should find their cultural and architectural identity, but this policy rethinking could not stop rural depopulation (Zahnd 205: 46-50).

Although Indonesia’s population growth has slowed down over the last decades (c.f. Figure 4), urban population was still increasing. It is probable that urban growth in Indonesia is caused by rural depopulation. Due to rapid urban growth there is also an increasing need for additional houses and infrastructure. Because the cities could not satisfy the demand for new housing, informal urban settlements and squatter settlements were established. These informal urban settlements are called Kampung (Baehr & Juergens 2006: 259). Kampung are not only unplanned urban residential areas, but also traditional residential areas or urban quarters or rural residential areas, which can be well-structured and socially mixed. Baehr & Juergens (2006: 259) distinguish between squatter Kampungs (built illegally or semi-illegally),
inner city *Kampungs* (densely populated and devaluated city centre) and mid-city *Kampungs* (elderly residential areas of traditional houses, lower density vale and better living conditions).

![Kampung entrance in Yogyakarta](image)

**Figure 7:** Entrance of a Kampung along Malioboro Street in Yogyakarta (own figure, 2014)

### 2.7.2 Indonesian and Javanese city models

In the 1990s, Ford developed a model of the Indonesian city (c.f. Figure 8). His model is based on McGee’s model of a Southeast Asian city (Baehr & Juergens 2006: 257p.). The model is based on the cities of Jakarta, Semarang, Surabaya and Medan, which are situated close to a port (Ford 1993: 376).

The model of an Indonesian city is divided into nine parts, which are located along a linear street or main boulevard (c.f. Figure 8). The street or boulevard connects the old colonial city with the elite residential area, which is situated at the outer-skirts of the city. The colonial city is built around a port which has lost its function nowadays. The model includes an international and a mixed commercial zone as well. The mixed commercial zone is called as the economic heart, where traditional markets and modern shopping malls can be found. The international commercial zone is dominated by office buildings, luxury hops, international hotels, discos and theatres (Ford 1993: 387). It is also very likely that *Kampungs* can be found behind towers or office buildings. In contrast to the international and mixed commercial zones, heavy industries, like shipbuilding in Surabaya, have a minor role in the structure of Indonesian cities, whereas craft-scale industries are typically, which are mostly situated in *Kampungs* (Ford 1993: 390p.).
Another characteristic of the Indonesian cities is the Chinese commercial zone. Since the beginning of the maritime trade in the prehistoric era, Chinese sailors built settlements in Indonesian cities, which were specialised on trade. To date, they are an important part of the urban structure. Their influence on commercial affairs could be preserved over the last centuries (Baehr & Juergens 2006: 258). However, since the era of Suharto, the so-called China towns are less distinctive due to law regulations (Ford 1993: 385p.).

The residential areas of the different social classes are partially spatially separated from each other (c.f. Figure 8). The elite residential zones have been built in the 18th century by the European newcomers, which are situated at the outer-skirts of the cities. These residential areas became more common in the 20th century by commercial and governmental uses as well as embassies, because they are large enough to constitute their own sense of place and identity (Ford 1993: 389).

Suburbs were built for the first time in the 1970s. Because of changes in urban infrastructure – such as ring roads, suburban industrial parks, shopping centres, university campuses, etc. – planned and affordable housings became more important, which have been built mostly on one or both sides of the traditional linear city (Ford 1993: 390). The suburbs are situated a long way of the elite residential areas and the Kampungs.

Kampungs, which are village-like, are separated from the formal zones, which is an important element of the Indonesian city (Ford 1993: 391). Most of the Indonesian urban population live in Kampungs. As mentioned before in chapter 2.3, there are different types of Kampungs. Inner-city Kampungs are the most densely populated residential areas of an Indonesian city. They are normally located between the colonial city and the new inland cores (Ford 1993: 392). In the 1990s, Jakarta’s inner city kampong reached a density as high as 100,000 persons per square kilometre. The overcrowded Kampungs must cope with not only environmental challenges, such as flooding during rainy season, but also infrastructural challenges, e.g. traffic noise, congestion, no piped water and non-existent dwellings.

In contrast to inner-city Kampungs, mid-city Kampungs are less densely populated (between 20,000 and 40,000 persons). Their infrastructure is better and environmental challenges like flooding are relatively rare because of flood-control projects (Ford 1993: 393). Some of them have a good location, because they are situated close to fashionable residential districts and employment centres.
Rural *Kampungs* are situated at the outer skirts of the Indonesian cities. In contrast to the other two types of *Kampungs*, rural *Kampungs* are not only specialised in craft-scale industries. They practise agriculture as well. Other features are low residential densities and gardens abound (Ford 1993: 394).

The lowest type of *Kampung* is the squatter *Kampung*. They can occur throughout the urban area, which are either temporary or have existed for a long time. Squatter *Kampungs* are mostly situated in marshland and flood zones, likewise in zones with transition to other uses (Ford 1993: 395). Conditions of living are often bad. Even people with income have no interest in improving their residential property.

There are also two other types of Indonesian cities, which have some additional features. They are called interior towns and palace cities (Ford 1993: 376). Over the last centuries, Indonesian cities have been formed by the influence of Hinduism, Islam and the European colonial power. This model (Figure 8) fits to Surakarta and Yogyakarta partially, because they are not coastal cities.

Javanese cities, which have been built by Hindu or Islamic rulers, are mostly built along two axes, which stretch from north to south and east to west. Instead of a port, a Craton (seat of the sultan) is the centre (c.f. 1 in Figure 9) of a so-called palace city, which can be located as well at the southern edge of the centre (Obermayr 2017: 90; Zahnd 2005: 85). A Craton can be found in Surakarta and in Yogyakarta as well.

The Javanese palace city has five levels, which are based on strict social principles of the Javanese society (c.f. Figure 9). The other four levels surround the Craton in an orthogonally pattern as well. The sultan is surrounded by the family gentry (c.f. 2 in Figure 9) and rest of the gentry (c.f. 3 in Figure 9). These three groups live within the town wall. The urban population (c.f. 4 in Figure 9) live outside of the town wall, whereas the rural population live outside of the city (c.f. 5 in Figure 9).

![Figure 9: Spatial division of a Javanese palace city](own figure, 2015; adapted from: Zahnd 2005: 86)

During the colonial times the Dutch also had an influence on urban planning and architecture in the palace cities. A typical building of the Dutch colonial era is a fort, which was the manor and administrative headquarters. The fort has been built mostly close to the Craton. Fort Vastenburg in Surakarta was built in 1779. It is located on the North-East of the Craton. In Yogyakarta a fort can be found as well. Fort Vredeburgh, for strategic reasons situated on the North side of the Craton, was built in 1765 (Zahnd 2005: 87-89). The reasons behind are to control urban activities and to have an influence on the ruling sultan.
The next chapter will discuss Surakarta and Yogyakarta in more detail. The historic developments and their specific features of both cities will be described subsequently.

2.8 Introduction to Yogyakarta and Surakarta

The following chapter gives an overview of the cities, where the field work has been done. Surakarta is situated in the province of Central Java, whereas Yogyakarta is located close to the Southern coast of the island, around 65 km away from Surakarta in a province of the same name (c.f. Figure 10). Until the 18th century both cities belonged to the kingdom of Mataram. Because the Dutch wanted to secure their power, the kingdom was later separated into two parts. Surakarta became a vassal state of the VOC, whereas Yogyakarta became a sultanate (Dahm 1979: 82).

2.8.1 Yogyakarta

The province Yogyakarta, which is also a special province, is one of the last sultanates in Indonesia besides Kutei. Yogyakarta and its province, which consists of four districts and the city itself, are located on the Southern coast of Java. After the independency Yogyakarta was the capital city of Indonesia from 1945 to 1949 (Keasberry 2002: 18). In 2010 Yogyakarta had more than 390,000 inhabitants (BPS 2015). When Yogyakarta became a sultanate and gained a special status in 1755, Sultan Hamengku Buwono I. decided to move from Kota Gede, the former capital of the Mataram Empire, to Yogyakarta. Therefore he needed a new sultan palace (Kraton) (Subanu 2008 42; Zahnd 2005: 85). Before the Dutch conquered Yogyakarta in the 1830s, the urban population decreased from 60,000 to 30,000 people because of poverty, urban depopulation and epidemic plague (Zahnd 2005). At that time the Dutch population began to increase in Yogyakarta.

The infrastructure has changed throughout the years. In the North-East, a new garden city Kota Baru was built, also a railway was constructed in 1887. From that moment on,
Yogyakarta was connected with Western Java. A few years later the Dutch built a railway from Semarang to Yogyakarta via Surakarta. However, the Dutch were not the only foreigners in Yogyakarta. In the 19th century Chinese began to move to Yogyakarta. The Chinese population increased from 800 in 1830 to 7,200 in 1920 (Zahnd 2005: 91). Many of them settled and established businesses around Malioboro Street, situated north of the Kraton. This famous shopping street has always been the economic centre of Yogyakarta and many of the businesses are owned by Chinese or Chinese descendants.

There were also a small number of Arab immigrants, who lived in the Kampung Sajidan and Kauman (Zahnd 2005: 91). Their influence grew due to the growing number of Islamic schools and the good relationship to the Kraton. Some of the Kampung settlements were built near to rivers, but for a long time river banks were avoided. In the 1860s, an earthquake occurred and killed about 300 people. After the city had recovered from the shock, the infrastructure improved in the 20th century, but mostly the Europeans had an access to water pipeline, electricity and wastewater disposal (Zahnd 2005: 94). Before Yogyakarta got its independent status of special territory (because of the influence of Sultan Hamengkubuwono IX) in 1950, Yogyakarta was the capital of Indonesia from 1945 to 1949 (Keasberry 2002: 18; Zahnd 2005: 41). Caused by economic growth, Yogyakarta became more attractive in the 1980s and 1990s, public infrastructure and housing areas improved. From 1980 to 2000 the outer districts of Yogyakarta gained population rapidly, while the inner districts lost their appeal (Subanu 2008: 47p.).

Administratively, Yogyakarta consists of 14 sub-districts. These sub-districts are divided into 45 quarters with a total area of 32.5 km² (Yogyakarta Municipality 2005: 2). The quarters are further sub-divided into 769 RT’s. Just like Surakarta, Yogyakarta is crossed by flowing water. Gajahwong River crosses Yogyakarta in the eastern part, Code River in the centre and Winongo River in the western part of the city.

Yogyakarta became very important to Indonesia in terms of culture and education (Zahnd 2005: 95). More than 200,000 students are enrolled in 95 universities. One of the most prestigious universities in Yogyakarta and Indonesia is Universitas Gadjah Mada located in the north of the city. Beside education also tourism is very important for Yogyakarta. A lot of tourists from Indonesia and foreign countries come to see its cultural diversity. In the last decade many Kampungs had to be relocated because hotels were built in the inner city (Zahnd 2005: 95). These rapid developments led to expansion of the city and also to densification. As a consequence particularly poorer people are forced to live near risk areas, e.g. near river banks. During the last decades, Yogyakarta was hit by a number of natural hazards, e.g. earthquake and eruption of Merapi in 2006, and the eruption of Merapi in 2010 (Hadi 2008: 225; Surono et al. 2012: 122). Nearly 6,000 people were killed by the disaster in 2006 and more than 37,000 were injured. About 250,000 of 703,000 houses have been partly or totally damaged (Hadi 2008: 229).

In the past three decades, the outer districts of Yogyakarta grew. Because of the decentralisation law that replaced the centralised New Order policy after the fall of Suharto, it became possible for Yogyakarta to collaborate intensively with its neighbouring districts Bantul and Sleman for the past ten years. The synonym for this region is Kartamantul, composed of the three district names (LeGates & Hubalah 2014: 345). The rapidly urbanising region has about 2 million inhabitants. Handcrafts industries are growing and the planning area has become bigger, so there is a great pressure on the Kartamantul Joint Secretariat, established in 2001, which is responsible for planning (Firman 2010: 401; LeGates & Hubalah 2014: 347; Hudalah, Zulfahmi & Firman 2013: 72).
As stated above, tourism plays an important role for the region. Beside Bali, the region is the most important domestic and foreign destination in Indonesia, due to its cultural richness and historical legacy (LeGates & Hubalah 2014: 347). International tourism played a key role since the New Order policy. Tourists select Yogyakarta as a destination to visit the famous temples of Borobudur and Prambanan. Yogyakarta has also a good transport system, like the express railway service to Jakarta and Surabaya, bus stations and flight connections to Jakarta, Surabaya and Bali. Among the most popular destinations in Yogyakarta City is the Malioboro Street with its innumerable quantity of shops. At Malioboro Street it is possible to buy handcrafted products like clothes, batik, silverware and masks. Also several sorts of spices can be found there (Hampton 2003: 89). The Sultan’s palace, Javanese dance, shadow puppets and gamelan orchestras are important for the tourism sector as well (Hampton 2003: 89).

2.8.2 Surakarta

Surakarta is situated in the province Central Java. The city has nearly 590,000 inhabitants (BPS 2015). Surakarta was established in 1746 when Sunan Paku Buwona II, who was the ruler of the Mataram kingdom, had to leave his court because of the battles against the Dutch (Sudarmo 2008: 17). Surakarta was built close to the river Bengawan Solo. As a result of the Giyanti Treaty in 1755 the kingdom Mataram separated into two parts: Surakarta and...
Yogyakarta. The new vassal state Surakarta was led by the Pakubuwonos dynasty (Dahm 1979: 82; Sudarmo 2008: 17). In 1757, the treaty of Salatiga was signed. This treaty led to the fact that Surakarta was split again into two parts: Kasunanan Surakarta and the Pura Mangkunegaran, but both of them were controlled by the VOC (Sudarmo 2008: 17).

When Indonesia claimed independency under the guidance of Sukarno in 1946, both empires handed over their power to the government of Indonesia. After the independency it has been determined by the local authority that culture and tourism are important assets of the city, therefore seventy monuments, historic buildings and urban sites were separated in six categories to maintain the urban heritage of the city (Augustiananda 2012: 28p.).

The historic centre of Surakarta is situated in the southern part of the city, where also the sultan’s palace is located. The economic centre and the town hall surround the Kraton (Obermayr 2017: 131). The area is also very densely populated. Sub-standard housing units with high degrees of poverty are located close to the historic centre and to the river. The northern, western and eastern parts of the city are less densely populated. In the western part, the industries settled down, whereas in the eastern part the main university complex of the ‘Universitas Sebelas Maret’ is situated (Obermayr 2017: 92).

Nowadays Surakarta, also known as Solo, is divided up into five sub-districts (Kecamatan), 51 quarters (Kelurahan), 595 RWs and 2,669 RTs (Pemerintah Kota Surakarta; Solo Kota Kita 2010: 2). The city has an area of 44 km². Eight out of 51 quarters are situated in riverbank areas. Riverbank areas are not only denser populated than other quarters in Surakarta, but also mostly poor people live there (Solo Kota Kita 2010: 5). Due to the fact that the amount of poor people has increased in Solo over the last three decades and the problems with slum and squatter settlements have begun to grow, the so-called community-based housing delivery system was initialised (Sudarmo 2008: 20p.; Astuti & Prasetyo 2014: 594). The community-based housing delivery system, which is an informal system, became popular during the time of Surakarta’s former mayor Joko Widodo (Astuti & Prasetyo 2014: 594).

The developments began in 1999 when the decentralisation policy was established (Lourenco & Astuti 2011: 493). As a result of the autonomy, the provinces and cities were allowed to make their own planning and projects. In Surakarta the urban population also participated in the planning process. A new vision of Solo was launched in 2001 which expressed the variety of the city (Lourenco & Astuti 2011: 496). In 2005, Joko Widodo became mayor of the city. During his leadership the situation improved, but this development was also caused by the economic growth of Indonesia and the new decentralisation policy. The minimum standard wages nearly doubled from 2005 to 2010, the number of domestic and international tourists increased and the HDI improved (Lourenco & Astuti 2011: 496p.; Yuwono 2014: 26p.). During Widodo’s period of office, urban planning projects were developed. Social, health and education programmes were expanded upon as well as relocation and housing programmes (Lourenco & Astuti 2011: 497). From 2006 to 2008 the number of slum houses was reduced by almost two-thirds (Lourenco & Astuti 2011: 497).

Surakarta is also well known as a commercial city (Wijaya2009: 102). The most important product of the city is batik. At the beginning of the 20th century batik was made by an informal association in a village which was called Laweyan Surakarta. They were successfully producing hand-drawn and stamped batik, so their economic situation improved. After the independency of Indonesia, batik mercantilists were supported by the government, because at the end of the colonial era the Dutch put the batik mercantilists under pressure (Wijaya 2009: 102p.). After Suharto’s New Order policy was established, the batiks of Surakarta began to spread all over Indonesia. This was because a lot of capital was pumped into economic growth, and the handcrafted and printed batiks were promoted as well. Until today the batik industry has played an important role for Surakarta.
2.9 Bibliography


3. Coping with socio-economic transformations and natural-hazards in Yogyakarta’s Kampungs

3.1 Introduction to Yogyakarta City

Yogyakarta as the capital of the special region of Yogyakarta (Daerah Istimewa Yogyakarta or DIY) contains four regencies (Kabupaten): Bantul, Kulon Progo, Gunung Kidul, Sleman and the city itself (Kota): Yogyakarta. All together, they form an area of approximately 3200km² for the DIY, which makes Yogyakarta the second-smallest area of all provinces in Indonesia, after the Jakarta Capital Region. The last census in 2010 showed a population of 3,457 million residents in the region. In addition, the last official estimate in 2014 projected a population of 3,594 million inhabitants. According to the last census in DIY, the population density represents 1100 residents per km²: Therefore the region can be seen as one of the highest populated densities of Java.

It should be mentioned that the population increased about ten percent in the last ten years. Though Gunung Kidul holds the biggest area with almost half of the DIY area, Bantul and Sleman contain two-thirds of the entire DIY population making them the most populous regencies. In contrast, Yogyakarta City accommodates less than half a million people on 32km², resulting in a population density of more than 12,000 residents per km². The division between the genders is almost half but with a slight majority of men (BPS, 2015). Due to the extremely high population density and the accelerated decrease of free building land Yogyakarta City undergoes constant urbanisation developments. This leads to the effect that more and more residents of Yogyakarta City are forced to settle next to Code River. This river implies for the local community a remarkable interest, because it is used for their daily needs. Code River flows from Mount Merapi in the north through the entire city, splits in the middle and in the area of Bantul it merges with Opak River and ends at the Parangtritis coast at the Indian Ocean. Thus Code River passes three districts: Sleman, Yogyakarta City and Bantul and its overall length is about 41km (Heryanti, 2012).

The 2,900 metres high Mount Merapi is located about 28 km north of the city centre and one of the most active and eruptive volcanos in the world (see chapter 2.2). In its surrounding areas live about three million people, and in its direct proximity, in villages up to 1700 m, about ten thousands residents were affected by the last eruption in 2010 (BNPB, 2015).

During the fieldwork it turned out that Indonesia and Yogyakarta City are handling their implementations in a formal, informal and hybrid way compared to the European understanding. This means that strategies can be developed externally by local authorities (formal), internal by the community (informal) or as a hybrid form by both drivers. With regard to all three research areas in Yogyakarta city, there are not many internal, but several hybrid and some external strategies to deal with specific implementations. Thus, settlements
along Code River are mostly informal, but due to urbanisation settlement pressure they settled there with the understanding that they are more likely vulnerable against natural hazards.

3.1.1 Urban hazards and risks
In Yogyakarta City several natural hazards could be detected that influence the community. They are namely earthquakes, volcanic eruptions, flood, lahar flood and intense rain. The special region of Yogyakarta lies on a heavily active volcanic and tectonic area. The crossing of the Eurasian plate and subduction of Australian plate causes this major volcanic activity. More than five earthquake disasters have occurred in the DIY since 1937 with devastating causes. The last extreme earthquake happened on an early morning in May 27 2006 measuring 5.9 on the Richter scale. The epicentre was in the Indian Ocean 33km south of Bantul and affected all five districts of the DIY (Hadi, 2008). Due to the fact that the impact concentrated on the very populous south of the DIY, it caused very high damages on private houses and their residents. At least 6,000 died and many more were injured. A couple of traditional houses, which were heritage sites, were as well destroyed (Adishakti, 2008). Furthermore, small and medium enterprises were impacted and it was estimated that about 30,000 businesses were affected and 130,000 jobs were lost. This lead to rising poverty and unemployment levels in the special region of Yogyakarta. Nevertheless the government supported the area through reconstruction and revival of houses and businesses by earthquake stable standards. Additionally the government tried with these strategies to minimise hazardous effects in the future, but generally the approach is a mixture between top-down and bottom-up process (Hadi, 2008).

All other hazards are interacting with Mount Merapi. The most significant volcanic eruptions in the near past happened in 2006 and 2010. In 2010 all people within a 20 km zone around Mount Merapi needed to evacuate due to the highest level of the alert. Both events in the near past and the large evacuation zone show the periodically occurring danger of the volcano. Sadly residents consistently perish by ignoring the official warnings and safety strategies, being more used to a traditional handling. Nevertheless flood and lahar flood occurred in the same time in Yogyakarta City. In November 2010 the lahar flood stuck in the riverbank of Code River, but the flood was triggered by heavy rain all day long on the flanks of Mount Merapi. The flood reached up to one and a half metres of the riverbank and flooded about 300 houses along Code River (Heryanti, 2012).

3.1.2 Urban planning and housing policy
Yogyakarta was urbanised as a central Javanese City. This type of Indonesian or south-east Asian city has its origins as residence city. Yogyakarta itself was residence city from 1755 until 1812. Thus, it combined tightly political power and sacral meaning in comparison to the straight colonial-stamped coastal towns. The strong combination between politics and religion manifests in social- and spatial hierarchy (Siauw, 2003), which can be still seen in ownership structures, architecture and building fabrics today.

3.1.2.1 Land rights and ownership structures in Yogyakarta
Yogyakarta has a complicated ownership structure. This results out of the parallel validity of two justice systems in its history. In the former colonial era of Indonesia the Sultan of Yogyakarta had special rights and the justice framework of the sultanate was accepted parallel to the colonial right framework implemented by the Dutch. With the Indonesian independence the frameworks were integrated into the national administration system but without changing the land status of ground belonging to the Sultan. This means, that all ground under the former sultanate justice was adjudicated as owned ground to the Sultan. This was a serious part of Yogyakarta and is still today (Siauw, 2003).
Urban Resilience in Indonesia

Sultan Ground (SG) is defined as the land belonging to the Sultan where no other rights of ownership are given to anyone (Sosiawan, 2009). This is hard to define regarding the traditionally justice of the sultanate, which does not document any certification of the ownership structure. Nevertheless, the Sultan is owner of considerable ground of Yogyakarta and referring to the increasing urbanisation and inner-city densification it makes him to the most important land owner for Yogyakarta region. As a consequence lots of SG is used informally for housing (Siauw, 2003). Current developments are a stronger cooperation between local, regional, national authorities and the sultanate as well as the fostered participation with communities housing in SG (Sosiawan, 2009).

3.1.2.2 Urban planning and housing regulations in Yogyakarta

In 1972 the first masterplan for the province of Yogyakarta was established by the CIPTA KARYA, the national construction authority to deal with the upcoming urban development and to manage the issue of SG and national ground. The actual development masterplan in Yogyakarta is the Yogyakarta Urban Development Strategy 2019 by Electrowatt Engineering in cooperation with the CIPTA KARYA. The current strategy aims at the implementation of local stakeholders for planning, project organisation and monitoring as well as to foster the implementation of monument protection strategies.

The housing structure of Yogyakarta is heterogenous and can be separated into clusters of housing areas. The local administration divides four types of housing areas (Siauw 2003):

- **Type A**: Solid quarters with good building constructions and access to local infrastructures. Accommodations can be reached by car and are located along constructed streets.
- **Type B**: High densified areas located in the background of large business streets and main roads. Type B areas are characterised by tight streets that are not traversable by car.
- **Type C**: Squatter-settlements without any judicial basis. Generally located along riverbanks and railway lines in open urban space or marginal areas. Settlements for the low-income population with minor quality of housing constructions with collected materials. Ownership structures in squatter-settlements are mostly not clear.
- **Type D**: Row housings by the national social housing agency. Located in marginal areas. Those row houses are also built with minor quality materials but in a more solid way than type C settlements. Housing areas belonging to this type are generally not within walking distance.

The housing types are often merged with each other. Type B areas are named *Kampungs* but often are combined with type C areas. Indeed problematic for Yogyakarta is that nearly all housing areas have problems with ownership structures. This is the result of the particularity between land owning actors in Yogyakarta. To sum up and project it to the fieldwork, all research areas combine type B and C settlements located in Yogyakarta City. As defined for type B, the areas are located behind major streets or city-important locations and are called *Kampungs* but include informal housing particularly along the riverbank as defined for type C settlements. They also combine ground belonging to the Sultan as well as ground, owned by local and national authorities.

3.2 Motivation

The motivation for the research project was to investigate how local communities deal with natural hazards and socio-economic processes influencing their local development in the context of urban resilience. Besides detecting the influences, the identification of responses
is a major aim as well. To detect, analyse, classify and finally evaluate processes and strategies the research was framed into the DPSIR-Model as described in chapter 3.3.3.

The major aim for the field research was the identification of endogenous potentials of local communities to cope with these processes. Past and present dynamics in the community development of the Research Areas inside Yogyakarta City were analysed and evaluated with a mix of qualitative and quantitative methods (c.f. chapter 3.2.2).

With that a comprehensive research on community-based resilience, referring to processes as well as to strategies, will be done. Urban resilience can be defined as the ability of urban areas to deal with existing and/or future stressors, shocks and changes. The mentioned ability to do so is often connected to the interplay of three properties. These properties according to Folke et al. (2010) can be defined into:

- **Being able to resist:**
  The ability to absorb shocks, stressors and change and still supply certain functions and maintain critical relationships.

- **Being able to adapt:**
  The ability to adjust responses to (changing) external drivers and internal processes in order to allow development within current conditions.

- **Being able to transform:**
  The ability to a) develop alternative development paths and b) to cross-existing thresholds to implement such an alternative development trajectory.

According to those properties the importance of the detection of influences on the local communities has to be interpreted as high. Without any detection there will not be any perception of those potentially harmful processes. At the current state and the local perception of urban development, environmental management and disaster risk reduction have to be identified to analyse subsequent potential efforts and measures that have been taken to tackle existing problems. Those can be differentiated into formal and informal Kampung based strategies for local community development. Recommended actions towards future frameworks of urban resilience on the basis of urban development, environmental management and disaster risk reduction will be formulated. The interplay of these three abilities is seen as a precondition for remaining within stable conditions, continually changing and adapting yet remaining within critical thresholds. It is further seen as a viable strategy or as adaptive governance approach on the one hand to minimise unavoidable losses and on the other hand to maximise beneficial opportunities due to socio-ecological change.

### 3.2.1 Deduction of research questions

The main goal of the CURE-Project was to assess actual and future strategies for Kampung based adaptive governance towards urban resilience in three Research Areas along Code River in Yogyakarta City. The project focused on two selected major drivers: natural hazards and socio-economic processes. Accordingly, the following three research questions were derived:

1. How do natural hazards (focus on flood risk) and economic processes (tertiarisation, tourism etc.) influence Yogyakarta in general and the community development in the three research areas in particular?
2. What strategies have been applied to deal with the detected influences by the local communities and specific actor groups (local business)? How successful are/were they?
3. What recommendations can be given to foster adaptive governance towards urban resilience in each of the three research areas?

The fieldwork of the CURE-Project is based on the community level to foster strategies against identified harmful processes for local communities, including both natural and man-made hazards. Additionally the Code River transect was investigated for gaining a broader view about urban development processes. To deal sustainably with the perceived influence and fulfil the three properties of Folke et al. (2010) it is important that the investigation on natural and socio-economic processes is based on the same hierarchy level. Although the research deals with dynamics on the local level with the aim to strengthen communities, it is not less important to generalise processes with their effect on the city of Yogyakarta as well as to identify formal strategies implemented on the regional and city level. For example this might answer the question as to why a community based strategy is successful, unsuccessful or even not implemented.

3.2.2 Methods

To answer the research questions a mix of different methods was used and executed under the framework of the DPSIR-Model for community based resilience (c.f. 3.3.3). To detect local drivers, pressures, states and impacts influencing the communities and the responses of the communities, the fieldwork was structured into the following methods:

- **Expert interviews:**
  Experts were interviewed on topics of natural hazards, disaster risk management as well as on urban planning and urban development. The interviews were conducted with an open interview guideline to get information of how Yogyakarta is influenced in general and which strategies are implemented on a city- or regional level. Additionally information of differences in the social and political system to the European understanding will be pursued. Experts are researching on the above mentioned topics at UGM and were selected in the pre-fieldwork process.

- **Participatory mapping:**
  Local key actors on different hierarchic levels (Kelurahan and RW) were interviewed during the fieldtrip. The local key actors mapped basic, social and economic infrastructures, points of interests, processes and hazards impacting on the whole or single parts of the community. Additionally they signed and mentioned implemented strategies done by the community representatives or other important community actors. For further comparability the mapping was structured by a guideline equal to all study sites. Additionally the received data basis was used for quotations within each research area.

- **Questioning small-business entrepreneurs:**
  Standardised questionnaires were conducted with all available local small-business entrepreneurs inside the research areas. The aim was to collect data concerning the perception of natural hazards and socio-economic processes of this specific actor group and how they react to it.

- **Own survey**
  In addition, own mappings of each RA and their surrounding areas within neighbouring quarters beyond the RA boundaries were conducted. Therefore the results of the participatory mappings were reviewed and additionally substantiated with own findings. Consequently, a better comparison between the three RAs is the result.
This mix of methods provides a holistic overview on ongoing processes. Furthermore it allows a comparison of drivers and processes perceived within different local communities as well as between communities and experts.

### 3.2.3 Analysis and evaluation scheme

To analyse and evaluate the received data and answer the research questions the following chapters within the report are discussed separately for each research area according to the research questions. To facilitate the analysis of perceived threats and responses the analysis in chapter 3.2.1 was separated into natural hazards and socio-economic processes as well as into strategies on natural hazards and strategies on socio-economic processes.

Chapter 3.4 describes the investigation of the Code River transect in context of Yogyakarta City and will lead to further details of each RA and their communities. Chapters 3.5, 3.6 and 3.7 presents impacts of natural hazards and socio-economic processes and the strategies to deal with them in each of the three RAs by their communities. At the end of each RA an evaluation of responses on natural and man-made hazards is done on two levels. At first strategies are evaluated based on the interviews conducted in the different RAs, the Code River transect and the small-business entrepreneurs. Then as a second step, strategies are summarised and categorised into good and bad working strategies on the community level. Finally recommendations to improve local communities in consideration of creating urban resilience are given in chapter 3.9.4. Chapter 3.8 investigates the perception of small-business entrepreneurs. This is done for all RAs within the Code River transect to point out similarities and differences in the perception, especially referring to socio-economic processes and gives access to potentially informal, self-developed strategies against those processes.

To conclude the research in Yogyakarta, chapter 3.9 summarises all community strategies found during the interviews and seeks to classify them by the three resilience properties as defined by Folke et al. (2010). This serves to provide recommendations and answer thereby the last research question on how to foster adaptive governance towards urban resilience in each of the three research areas.

### 3.3 Theoretical background

![Author](Susanne Kubisch)

#### 3.3.1 The concept of resilience

Continuing population growth, increasing urbanisation, economic crises and natural catastrophes call for the need of more resilient systems to withstand these shocks and to cope with the increasing pressure (Desouza & Flanery, 2013; Agudelo-Vera, Leduc, Mels, & Rijnaarts, 2012; Folke, 2006). These pressures cause, like mentioned before, degrading ecosystem-services, augmentation of natural hazards and changes in socio-economic development, amongst others (Walker & Salt, 2006). As a consequence, systems are forced to adjust continuously to this changing environment. In the literature, the capability of a system to cope and recover from an external stressor is called resilience (Klein, Nicholls, &
Urban Resilience in Indonesia

Thomalla, 2003). Resilience not only refers to the magnitude of a shock a system can cope with and still remain at a given state, but also to the degree of the system’s ability to self-organise and the capacity to learn from shocks and to adapt (Folke et al., 2002). Hence resilience is the preferable state of natural and human systems - including cities - to meet possible stressors and to cope with and recover from external shocks (Klein, Nicholls, & Thomalla, 2003) like weather-related hazards (UN/ISDR, 2002).

3.3.2 Urban resilience

Based on the increasing understanding of the central role of cities as contributors to global social, environmental, and economic progress, and because there is a need to move beyond conventional approaches to disaster and climate hazard mitigation and prevention, the forward-looking, holistic approach of resilience is used in the context of this new urban era (UN/HABITAT, 2014). This extract of the (UN/HABITAT, 2014) "Medellin Collaboration on Urban Resilience" emphasises the concept of resilience as a new development strategy for urban areas.

Different discourses about resilience exist in the urban context. The urban ecological resilience literature understands resilience as the capability of an urban system to cope with disturbance while at the same time structure, identity and key processes of a city are sustained (Resilience, 2007). Within the field of urban hazards and disaster risk reduction, resilience means to empower the ability of cities, infrastructure and community to recover from natural as well as from man-made hazards (Coaffee, 2008). Urban hazards could be among other weather-related hazards, like flooding or poor air quality and deteriorating water quality (Klein, Nicholls, & Thomalla, 2003). Research therefore also includes how to quantify economic resilience to natural disasters (Rose, 2007). In the realm of urban and regional economies, work in terms of resilience emphasises theories of self-organising systems to explain the evolution of urban and regional economic and industrial systems (Pendall, Foster, & Cowell, 2010). Also, climate change is picked up as an external factor that faces urban environments (Pike, Dawley, & Tomaney, 2010). Furthermore the connection between growth, diversity and volatility is examined to explain the linkage between resilience and geographical inhomogeneity (Essletzbichler, 2007) (Pendall, Foster, & Cowell, 2010). Studies about governance and institutions in the area of urban resilience prove, amongst others, how different institutional structures influence the resilience of local surroundings (Ostrom, 2010) and how the consolidation of the term resilience helps to improve the development of governance systems to increase adaption through social contracts (O’Brien, Hayward, & Berkes, 2009) or community-based adaption (Swalmheim & Dodman, 2008).

In general the resilience of a city refers to the capability to absorb, adapt and respond to changes in an urban system (Desouza & Flanery, 2013). According to Folke et al. (2010) this ability is based on the interplay of three characteristics. It relies on the ability to persist in case of shocks, stressors and changes and still supply certain functions and maintain critical relationships. Secondly it is based on the ability to adapt in form of responses to external drivers and internal processes in order to allow development within current conditions. And thirdly it relies on the ability to transform, specifically to be able to evolve alternative development paths or to cross existing thresholds to implement such an alternative development trajectory. Accordingly these three abilities build the precondition for the maintenance of a stable state, continually changing and adapting yet remaining within critical thresholds. Furthermore resilience is seen as a viable strategy to minimise unavoidable losses and maximise beneficial opportunities due to socio-ecological change.

Based on the factors mentioned above some cities have the ability to cope and recover from external influences while others barely do (Klein, Nicholls, & Thomalla, 2003).
3.3.3 The DPSIR Framework

For answering the research questions the Driver-Pressure-State-Impact Response (short DPSIR) framework (Carr et al., 2007) was adopted (Figure 12).

This model was developed in 1999 by the European Environmental Agency as an interdisciplinary model to derive knowledge on the state and causal factors of environmental issues (Svarstad, Petersen, Rothman, Siepel, & Wätzold, 2006). The framework reveals a bond between driving forces (D) which are provoked by pressures (P) to states (S) and impacts (I) on the system. These triggers could eventually lead to political responses (R) (Boulanger & Gentile, 2008). According to (Frederiksen & Kristensen, 2008) this causal chain has to be broken down into steps to reveal the relationships and interaction between the single elements of the DPSIR model. Therefore the DPSIR model is a useful framework to assess socio-economic and environmental concerns (Boulanger & Gentile, 2008).

To get a better overview about the different elements of the DPSIR model, they will be explained in detail below. Driving forces are in general forces that are responsible for the change in a system. They evolve from social, economic or ecological nature and may have positive or negative impacts (Boulanger & Gentile, 2008). Indicators for driving forces are, for example, social and economic changes in societies like changes in consumption or production patterns (Jago-on et al., 2009). In the case of the fieldwork, drivers could be for example natural hazards like flood or lahar flood. In some cases, pressures refer to human activities, and are the result of the driving forces and influence the environment.
In other cases, pressures could emerge as natural processes like volcanoes (Carr et al., 2007). Hence pressures are a local manifestation of the driving forces. The local manifestation of a lahar flood is for example the risk of lahar flood of the RA. The state in the DPSIR model is related to the physical, chemical, biological and socio-economic situation of the environment under current conditions (Boulanger and Gentile 2008). Vulnerability against responding to coping capacity for a certain pressure, for example floods, represents a state in the framework. Changes in the state in turn results in impacts (Carr et al., 2007) on social and economic functions of the environment (Jago-on et al., 2009) and consequently human well-being (Carr et al., 2007).

Impacts could be divided into direct impacts, like changes in water quality, and indirect impacts, like health problems (Boulanger & Gentile, 2008). The deterioration of water quality in wells induced by lahar flood in the RA for example would belong to the ‘impact’ category in the DPSIR. Response indicators address shifts in state (Carr et al., 2007). Respondents could be different groups within a society like governmental institutions. Response aims to prevent negative outcomes in the environment, to improve conditions in the environment or to adapt to transformations in the state of the environment. Response not only refers to changes in the state, but it also could be a direct reply to driving forces, impacts or pressures. The temporarily occurrence of responses depends on how problems are perceived, assessed and understood (Jago-on et al., 2009). Responses on the driver lahar flood could be, for example, the wall embankment to protect the houses near the river.

The DPSIR framework serves to derive detailed information on the relationship between human activities, environmental consequences and responses to changes in the (social and natural) environment (Jago-on et al., 2009).

Figure 13: Adaptive governance within the DPSIR framework in detail (own figure, 2014; based on: Carr et al., 2007)
Based on the literature review and previous studies in Yogyakarta, the DPSIR framework was adapted to suit the local context, as shown in Figure 13. Drivers and pressures were explicitly divided into socio-economic and ecological. The main socio-ecological drivers in the RAs are availability of natural resources, existing natural hazards and climate change impacts as main ‘natural’ drivers, and demographic and economic as well as urban development on the socio-economic side. Subsequently, flood, lahar flood, and landslide are the main pressures induced by natural drivers, while tertiarisation, touristic transformation and Kampung population dynamics are determined to be the main socio-economic pressures from outside onto the area. These pressures result in states, among others infrastructure and services, vulnerability, risk perception and local development strategies that were assessed throughout fieldwork. These states in turn have impact on the goals of local sustainable development as defined by the communities, income generation or destruction and land degeneration. The institutions, like the communities, the government or any other institution, act on these impacts in form of responses. Responses are, for example, coping, adaption and transformation strategies. Accordingly, these responses influence back on the drivers, pressures and impacts.

To return to the fieldwork in the RAs in Yogyakarta, the strategies which were induced of the DPSIR model are evaluated by the “Resilience Check” framework. This “Resilience Check” assesses the strategies of the RAs and categorises these strategies by their impact and whether they are evaluated as able to resist, to adapt or to transform. The results of the “Resilience Check” are presented in the overall conclusion at the end of the next chapter.

The following chapter covers the research questions answered by the DPSIR framework, expert interviews as well as mapping in the fieldwork area and gives an insight into the socio-economic development and disaster risk reduction strategies of each single RA, all embedded in the field of resilience.

### 3.3.4 Selection of research areas (RAs)

The excerpt above emphasises the importance of urban resilience within socio-ecological change. The project on urban resilience and how to create urban resilience, named “Create Urban Resilience”, short “CURE” was executed by the students on the level of Kampung. Kampungs are districts that are in themselves closed in regard to the administration, and consequently underlie the power of different community leaders. Due to the separated administration of the Kampungs, different community-based socio-economic development and prevention measurements are applied. Hence adaptive governance of disaster risk and community development strategies has been examined in different Kampungs. The main goal of the project was to assess actual and future strategies for adaptive governance towards resilience in three Research Areas along Kali Code River in the central part of Yogyakarta.

The above mentioned concept of urban resilience is examined. A special focus thereby is on the concepts of urban hazard and disaster risk reduction as well as resilience of self-organising systems to explain urban and regional economic development. Also governance and institutions in the area of urban resilience are proved and community-based adaption is examined.

The selection of the specific RAs was based on different reasons. All three riverine RAs are located at the Code River Transect and are exposed similarly to natural hazards, in particular to flood and lahar flood. However, from a socio-economic point of view, the surroundings of the RAs differ due to their distance to the city centre, which is also the economic and touristic centre of Yogyakarta. All three research areas are principally residential areas, but they pass different stages in the development of socio-economic processes and in the handling of natural hazards. Consequently, socio-economic development and prevention strategies were examined to compare the development and strategies in the three RAs.
Hence to frame the project and examine the strategies towards urban resilience two major drivers, natural hazards and community development, were selected. Therefore three research questions were elaborated on, which are described in chapter 3.2.1 “Deduction of research questions”.

3.4 Introduction to the research transect area

3.4.1 Introduction

This part of the paper gives an overview of the current developments, processes and strategies of the Code River transect. The spatial structures have been analysed with inspections and mapping in and around the Research Areas. In addition, three interviews with experts for urban development and disaster risk reduction in Yogyakarta have been done to get a deeper understanding of the development on local, urban and regional scale. The collected data has been analysed and evaluated in terms of resilient and sustainable urban and community development.

3.4.1.1 Geographical situation of Code River transect

The Code River transect means the surrounding spaces of the three Research Areas seen in Figure 15. It expands about 3.5 kilometres from the north to the south and about 1.5 kilometres from the East to the West. To understand all processes of the current development in these areas it is important to have a look at the whole urban surrounding.

The Universitas Gadjah Mada (UGM) is located in the north of RA1 and an important development factor for the city. With more than 55,000 students and 18 faculties, is the UGM the largest, the oldest and one of the most prestigious universities in Indonesia (Berita, 2014). It represents the centre for learning, innovation and efforts, for example to find answers to ecological issues. The campus and the areas around are in continual change because of the increasing number of students. Especially the number of foreign students is increasing rapidly (Leksono, 2008:45). The campus of the UGM is a special area in Yogyakarta. It is like independent urban dynamics. The large area is characterised by institutes, study facilities, student homes and a lot of other facilities, e.g. food courts or supermarkets.

In the west of the Research Area the Malioboro Street is located, which represents the touristic centre of Yogyakarta. This north-south axis is characterised by a lot of souvenir shops and Warungs and other touristic services, like rickshaws, batik markets, hostels, hotels and restaurants. Near to the Malioboro Street are a lot of hostels and middle class hotels and touristic services, seen in Figure 14. Northway from the Malioboro Street are the higher-class hotels.
At the southern end of the street, the Kraton (sultans place) is located. This place represents the cultural centre of Yogyakarta and one of the centres of Javanese culture. The areas around the Kraton and the Malioboro Street are the centre of touristic activities and present the economic centre of Yogyakarta (Hampton, 2003:93). The east side of the city centre is a dynamic area, which is characterised by many handicraft productions. The Pakualaman district is also a cultural hub in the east of Yogyakarta.

The three Research Areas are located along the Code River, which originates in Merapi volcano area, about 50 km north of Yogyakarta (c.f. chapter 2.8.1). RA 1 is the northernmost area near to the UGM. After this, RA 2 is located in the middle of the research transect, east of Malioboro Street and the main station. RA 3 is less near to the Malioboro Street but close to the city centre and the southernmost part of the research transect.
Figure 15: Surrounding area - Code River transect
(own figure, 2015)
3.4.1.2 Characterisation of Code River transect

The three Research Areas are located along the river. Often there are houses built directly at the riverbank. From this, it can be concluded that all areas are potentially affected by related natural hazards, in particular flood, lahar flood and flood-induced landslide at those parts of the riverbank with steep slopes. Comparing the Research Areas, it shows that they are not as uniform as they may appear at first sight. Due to the rapidly growing touristic and economic development of the city, all Research Areas are affected by different socio-economic processes. This is especially true for the areas near the Malioboro Street because this area is the development centre of Yogyakarta. These processes are influencing the development inside and outside of the Research Areas.

RA 1 and the surrounding spaces are not yet as intensely affected, by the rapid hotel development, as RA 2 and RA 3. The hotel constructions are a result of the increasing tourism industry. In the surrounding areas a lot of small business activities emerge. In proximity to RA 2 are the Malioboro Street and the centre of services, especially touristic services in Yogyakarta. In this area the number of hotels and vertical housing (c.f. chapter 3.6) is higher (interview 15). Conspicuous is the classification and partition of services. This will get to a high concentration of services around the Malioboro Street. There is one street only with shoes, one street only with trophies or one street only with motorcycle helmets. The goods that are traded are slightly changing towards more souvenir and touristic items with proximity to Malioboro Street and some major hotels. This can be considered to be an impact of an ongoing tertiarisation process.

In and around RA 2 there are several vertical housings, which originated from the growing housing demand. The vertical housings are mainly used for social housing projects. The results of newly built hotels and the increasing number of immigrants to Yogyakarta are further relocations of the people and new settlements along the riverbank. To get space for hotel constructions, local people had to remove their houses. As a consequence of this, the people have built illegal houses at the riverbank (interview 2). The influence of the development processes on RA 2 is the most intense, because of the closeness to the centre. Further downstream the Code River RA 3 is located less close to the fast increasing development processes. In the surrounding spaces are also recently build hotels and vertical housings, but inside the area the influence is not yet as high as in RA 2.

RA 3 is characterised by small business activities, some smaller hotels and a comparably worse basic structure of buildings near the riverbank. The worse basic structure is probably due the low income of the people who live at the settlements along the riverbank (interview 2). Also, most of these buildings were damaged by a strong earthquake in 2006. The influence of the development processes can be indicated by the increasing traffic volume and the rapidly growing number of new, big hotels in the surrounding area (c.f. Figure 16). In conclusion, it can be said that there are different influences on the three Research Areas.
3.4.2 Large-scale urban transformation and responses

The area of Code River transect changed in the last years due to many immigrants and an increasing housing demand. A positive population development can be observed in the whole city (Zahnd, 2005:95). New settlements were built along the riverside, which is an area prone to flooding. Before, there was a bamboo forest along the river bank, serving as natural flood retention area (interview 4). Because of the settlement, the natural buffer zones along the riverside vanished. Another consequence of the immigration results in conflicts between the local people and the immigrants, mainly because of their different cultural backgrounds (interview 21). In interview 2, the reason behind was described as an absent comprehension for the system of the Yogyakarta regions. Below the influences of natural hazards and actual socio-economic processes and strategies to deal with this influences are analysed in more detail.

3.4.2.1 Influence of natural hazards on urban development in Code River transect

In Yogyakarta, the areas along the rivers are particularly prone to natural hazards. Code River is emanating from volcanic slopes in the north of Yogyakarta and flows through the inner city, to the alluvial plain in the south of Java. The primarily natural hazards in the Research Area are flood induced by intense rain and the lahar flood, which happens after an eruption of Merapi. “Lahar flood is a general term for a rapidly flowing mixture of rock debris and water [...] from a volcano.” (Smith & Fritz, 1989:376) Because of the steep slopes along the river, there are also landslides triggered by the intense rain (Hidajat & Voss, 2001:175). The region is also affected by earthquake (Hadi, 2008:229).

The annual flood events result from intense rain during the monsoon season from October to April. Flood intensity and impacts are likely to be increased by different factors: One problem is the insufficient sewer system, which cannot cope with the volume of water.
Furthermore, the mass of waste, especially plastic waste, congests the drains. The water cannot run off and exacerbates the flood. Thereby buildings and infrastructure are damaged by the standing water. Another hazard is the lahar flood. The erupted material from Merapi will flush into the Code River. Depending on the water level, it can wash away the houses constructed along the river. If the lahar flood reaches the city areas, the sediment congests the wastewater disposal and the water supply. After the lahar flood the sediment accumulates on the housing areas and clogs the sanitation system (interview 4). In particular, the damage of basic or social infrastructure poses a problem for the communities. Wells are congested, public toilets (which usually are located in direct proximity to the river), water supplies and waste water disposals alike. In Interview 4, it was mentioned that the pollution of ground water had caused illnesses inside of the community of RA 1. The unavailable access to social infrastructure facilities, like schools, mosques or hospitals is another challenge for the communities and the government. In the course of flood and lahar flood the traffic infrastructure can be impaired because water can harm the road structures. Interviewee 1 mentioned that the population in the upstream areas have a higher risk level compared to the downstream areas. The impacts in the downstream areas are less but still extensive.

The steep slopes along the river can trigger landslide, exacerbated by the often poor construction of houses and embankments. As a consequence, the risk of houses to be damaged or destroyed is high, and even raised by the increased housing demand leading to new settlements at the river bank. Another consequence of the growing building density is the risk of fire in the area, as mentioned in interview 4.

3.4.2.2 Strategies of communities to cope with natural hazards in Code River transect

The natural hazards and resulting challenges have a high influence on the urban development in the whole Research Area. Due to the different structures of each area a lot of strategies to deal with it can be found. First, it can be mentioned that the potential hazards were classified in different risk categories by the interviewees. Earthquake risk is hardly noticed by the local communities. In fact, no interviewee or community members talked about earthquakes in detail. Because of the low-rise construction of the buildings, the risk of structural collapses is minimised. However, the bad basic structure of the buildings can be a risk factor. Other hazards are perceived more, because of their direct and regular impacts on the communities. Many of the implemented strategies deal with flood and lahar flood risk reduction. Spatial plans of Yogyakarta predetermine a 50 m buffer zone for prone areas. The problem is, this buffer zone is dominated by dense illegal settlements. Besides the high risk level due to natural hazards, the high-density structures and the different composition of the inhabitants can result in social problems (Sukoco, 2013:13). To be prepared for the disaster, there are different early warning systems. In an overview of the whole area, it can be observed that each of the communities has different plans in case of emergency, e.g. what to do in case of evacuation or flooding. It seemed that all RWs and RTs only came up with some individual plans. However, there are some programmes for standardising evacuation plans. These programmes are implemented by the local government and NGOs (interview 1). They have much attention at most affected areas. They put their focus on the upper stream, because the population have higher risk compared to the downstream areas. In interview 1 it supposes, when all the evacuation systems are pass the test in the upper stream areas, there will be another opportunity to bring this more in the downstream areas.

The target of the local government is the idea to develop a resilient Kampung. As an official programme the development of resilient Kampung has the goal to set up preparedness of local communities in case there is an emergency situation (interview 4). This is only a beginning process which has not been implemented in many areas so far, therefore its impact or success cannot be evaluated yet. After the evaluation of the upper stream programmes, the collected data can be used for the downstream areas (interview 1). The implementation
of those programmes or ideas is different, depending on the area. In some parts, the disaster risk management is a top-down process and sometimes a participatory process including the local communities. Also, bottom-up implementations can be found. The communities come up with their own ideas. For example, in case there is a flooding, the upstream RW will give a phone call to downstream areas. But on the other side, there is a formal early warning system in some areas (interview 1). They use a two-step system. The first step is the monitoring and measurement of the technical data of Merapi and Code River. Step two is to warn the communities with a siren if the Code River reaches a certain level. In this case, the flood-prone areas have to be evacuated. In some RWs there are evacuation plans and routes. Additionally, in these areas, simulation of emergency situations takes place to educate the local people about hazard risks (interview 2). Another strategy to deal with the influence of natural hazards is the informal group Ulu-Ulu, which comprises of one member of each community from upstream to downstream (interview 4). The group monitors the Code River and is responsible for providing information about the increasing water level during intense rainfall. They also monitor the cleanliness of the river.

Additional measures to protect the affected areas in case of flooding are wall embankments. Along the river a dike was built by different actors. The construction of wall embankments was funded by the government, while the construction itself was done by the community, with the assistance of the national military. Also, some parts have been built by the local communities themselves (interview 3). The problem with these parts is the comparably poorer quality. These parts are too low and only after the flood have they been built higher, posing questions about their efficiency in a next flood event. People who live near the riverbank depend very much on the construction, because it is their main means of protection. In case of emergency sand bags will be used as additional wall embankment (interview 4).

One strategy can be to relocate the people who live near to the river. If there are settlements in areas which are most affected by natural hazards, it can be a solution to relocate them to several places. The result of this is a less high risk level from natural hazards in the hazard-prone area. The interviewee 3 mentioned that this will be the last option: “If there is no better option, we have to replace them”. But the main focus is to protect the prone areas.

The evaluation of these strategies is diverse. There is some potential for conflicts, because of misunderstanding between the government and the local communities. In some parts of the Research Area the risk due to natural hazards could be reduced by the implemented strategies. But in some areas the protection is not given yet, in particular due to the insufficient height of the wall embankment along the riverside (interview 2). In some parts, the structure wall embankment is worse. Some parts are broken, like as seen in Figure 17, and there is no protection now.
3.4.2.3 Influences of socio-economic processes on urban development in Code River transect

Yogyakarta is urbanising rapidly. The drivers for the urban development and transformation are population growth and the subsequent increased housing demand. Interviewee 1 mentioned that the main challenge is that the city needs more space for its population. Borders of the urbanised area are growing towards the north and the south and the housing density is increasing in the city centre. There are many illegal settlements along the urban rivers due to many immigrants from the periphery areas, which come to the city because of better job opportunities (interview 1). These immigrants started new businesses. This development can be observed especially in RA 3. As a result there are conflicts between the local people and the immigrants, because of cultural misunderstandings. Interviewee 2 was concerned: ‘The negative influence of the immigrants coming to Yogyakarta is they do not understand the system of the Yogyakarta regions’. Such statement shows potential conflicts between the local people and the immigrants. A view to RA 1 shows there are no conflicts and the area is not coined due to crime, because of the strong community in this area. They have a hard focus on safety and also the programme of resilient Kampung has started there (interview 4). Contrary to this example, in RA 3 the interviewees of the small business questionnaires were critical in reference to the immigrants (c.f. chapter 3.8).

The actual development processes in the city centre are the elucidate urbanisation resulting in many immigrants and the increasing tertiariisation as a consequence of the rapid economic and tourism development. The economy expects to benefit greatly from growing numbers of tourists (Dahles, 2001:93). Tourism is actually the main development factor for Yogyakarta. The main sources of income are tourism and also other services. The importance of
Yogyakarta as an international tourist destination is growing. Today the city is the second tourism destination after Bali. Amongst others it distinguishes itself by its historical background and the traditional culture (Hampton, 2003:89). In Yogyakarta there are a lot of new hotel buildings. This increases the future number of tourists. The hotel development in the city centre is rapid. The influence on RA 3, and even more RA 2, is especially intense. The hotels increase the pressure on the building areas. One effect is that resettlements struggle to provide more space for a new big hotel (interview 1). As a consequence of this, there are many brown fields near to the Research Areas (c.f. Figure 18). In RA 1 the influence of urbanisation and tertiarisation is not very intense yet, because of being less close to the city centre. In the future, the pressure from this development processes will be increase because of new planned hotels in the south of RA 1.

The hotel constructions also provide new potentials, e.g. the surrounding community can be involved in the hotel business, as employees for doing laundry or other services. As a consequence there are potential mutual benefits for the nearby communities and their inhabitants and also for the hotels (interview 4). On the other side there are also negative impacts. Due to the building of big hotels and the ditches for the foundation, the groundwater level has been lowered, resulting in potential problems with availability of groundwater in the communities. Furthermore, open spaces are scarce in the city centre and the provision of green open spaces is a challenge for the local government. Interviewee 4 asked: “How the image of Yogyakartas culture will [persist ... next to] so many hotels like that?” He sees a task of the government to be limiting the number of the hotels.
Figure 19: Current development processes in Code River transect (own figure, 2015)
3.4.2.4 Strategies of communities to cope with socio-economic stressors and disruptions in Code River transect

The main challenge for the communities, the local government and also the business carriers to deal with the influences of urban transformations is how to balance economic and social development in a spatial manner. Urban development is formally regulated by a spatial plan. The spatial plan in Indonesia is a development plan on different levels, all based on the legal specifications by national level. The spatial plan for Yogyakarta proposes areas for business improvement, also in the Code River transect. The target is to achieve a balance of economic distribution among the different areas of the city centre. The spatial plan also discloses new development areas and defines development goals for them (interview 1). Interviewee 1 mentioned that either the local government tells the local communities about the strategies or also the local communities have the right to present some project and to consult the local government. Actually there are a lot of programmes on the community level but it is hard to say how successful they are. The main problem is how to evaluate or monitor the sustainability of the programmes.

One of these programmes on Code River transect is the public service of the students. Students of the UGM have the obligation to do a public service of 2 months during their studies. Students go to particular areas to develop and set up particular solution strategies, related to the communities. The work can be, for example, to clean the river or share the environmental knowledge of University people with the communities. This is a strategy to improve the Kampung. The communities work together with the students (interview 1).

There are many intentions to optimise the Code River transect. One of the issues is actually to foster the tourism in this area. The big hotels use the slum areas along the Code River as their main attraction. They use the situation of the communities as attraction, for people who have not seen such areas before. The Interviewee 1 criticised that this is the wrong driving force. A better solution can be the attempt to develop eco-tourism like in RA 2. This strategy is implemented by the communities themselves. The meaning of eco-tourism in Indonesia is not like in European perception. The local strategy comprises the greening of the spaces near to the river to bring the tourists into the Kampung. Interviewee 1 observed that the strategy has the potential to promote the whole area, for example in terms of establishing a cultural festival and the marketing of the traditional heritage. The implantations are sometimes not environmentally sound. An important aspect is the bad environmental condition of the river, which is polluted with the plastic waste and other garbage.

Inside of the different Research Areas there are many different strategies to deal with socio-economic processes. Some deal with the improvement of social aspects of the communities and others with fostering business activities. An example for business improvement is the cooperation between the big hotels and the local, small businesses, like in RA 3. This programme is organised by the local government. The hotels use and sell products from small businesses, which is of benefit to both sides. In return, the small shops have to promote the hotel or the local people can be hotel employees. The interviewees from the small businesses in RA 3 are satisfied with this programme (c.f. chapter 3.8).

It is important to have an overview of all strategies and all involved actors for the development of Code River transect. To arrange this there is the development plan meeting. This is a participatory process. The local government provides the information, establishes the plans and shares it with all the stakeholders. Everyone is invited in this meeting, government, institutions, local people, and NGOs. This is an instrument for communication, where everyone can put remarks or inputs. During this meeting there are a lot of conflicts and the challenge is to solve these, to find a good way to deal with influences of natural hazards and socio-economic processes (interview 1).
3.5 Assessment of Research Area 1

3.5.1 Introduction

This part of the paper is based on qualitative data which is analysed and evaluated with regard to a resilient and sustainable development. For that, interviews and in particular participatory mappings have been conducted with selected area representatives. Research Area one (RA 1), which is part of Kampung Terban, is located in the northern part of central Yogyakarta City. The area borders on the campus of the Gadjah Mada University (UGM), the collaborating university of the CURE project. RA 1 is located along the Code River. Like all other Kampungs also Terban is split into sub- and sub-sub districts, called RWs and RTs. RA 1 includes the RWs 04, 05 and 06. All RW interviews have been done for data collection, so that in total three interviews with area representatives of each RW and one interview with the head of the whole Kelurahan Terban were realised during the field trip in September 2014.

Figure 20: View towards north on RA1 - RW 06 in front (own figure, 2014)
3.5.1.1 Basic infrastructure of RA 1
For identifying and evaluating the basic technical and social infrastructure of RA 1, the area and its surrounding have been mapped. While mapping the area, it turned out that public toilets and wells or springs are important technical infrastructures inside of every RW and RT. These are very relevant places because of water supply and sanitation. It is typical for the investigated area that toilets are non-private and cannot be found in households. They are rather located in central places of the RW to ensure the water supply of all inhabitants for hygienic and household use. Toilets and wells usually can be found in the same place. Social infrastructures, in particular the mosques of the communities, have a dominating role for the interviewed people. Every RW has at least one mosque which points out the importance of religion. Other social infrastructural buildings were figured out as the offices for the community representatives as well as buildings for education and parenting. The offices for area representatives are significant for social life as well because they can be seen as the non-religious centre of the community. Often the offices have an open space included which is used for community events. In general it can be said that there are no clear boundaries between private and public spaces as known in the European context. Everyday life happens distinctly more collectively, where inside and outside of private households is less important and not household-separated.

The important infrastructure of RA 1 can be listed as:

- **Technical facilities:** wells and springs, public toilets, sanitation facilities
- **Social and religious infrastructures:** Mosques and Koranic schools
- **Social infrastructures for community ties and cultural identity:** Offices for area representatives, open spaces and education facilities

Having a look on RA 1 in detail, RW 04, 05 and 06 turn out to be heterogeneous compared to each other in terms of housing and business development. All RWs are located along Code River, which is forming their border to the West. RW 04 is a well-developed community with a relatively high quality of building fabric and rate of business accommodations. RW 04 is popular in Yogyakarta for its child-friendly neighbourhood, which is an indicator for an efficient, good working community. RW 04 borders in the north on the Jalan Professor Doktor Srdjito, a main road connecting northern Yogyakarta with the centre. Also, the Campus of the UGM is located along that street. RW 04 has good access to the infrastructure on city level and can be seen as potential for business accommodations. Several small businesses (c.f. Figure 27) are located inside of RW 04. They fulfil the demand of daily needs and deliver food inside, as well as outside, of the RW. Moreover, the mosque is located inside of RW, in the religious centre of the community, as well as the office of the representative of the RW which serves as office and municipal centre.

RW 05 is located south of RW 04. The two RW areas are hardly separable. However, there is a difference to RW 04, especially in terms of building fabric. This area is defined by private households and comprises of less business accommodations than RW 04 but includes the big market of Kampung Terban, Pasar Terban. Pasar Terban is an agglomeration of businesses of different types, located inside of a large hall. This is a typical Indonesian business agglomeration and the roofing ensures business also in the rainy period. The southern part of RA 1 locates RW 06, the third of the three areas that were investigated in RA 1 on urban resilience. In contrast to RW 04 and 05, RW 06 seems to have deficits referring to building fabric and spatial pattern. The bazar (Pasar) separates RW 05 and RW 06. Furthermore, as a business accommodation it surely benefits for both RWs (c.f. Figure 22). This part of RA 1 contains, as the only one, RW brownfields inside the community, resulting from the last lahar flood.

All RWs settle their water facilities near the river. Mosques and offices are located on more elevated places, away from Code River. Small businesses are not located centrally but are often integrated into the ownerships household.
Figure 21: Bazar between RW 05 and RW 06
(own figure, 2014)

Figure 22: Location and basic facilities of RA1
(own figure, 2015)
3.5.2  Transformative processes and responses in RA 1

3.5.2.1  Influences of natural hazards on community development in RA 1

First, a short overview is given concerning the kinds of natural hazards that are a potential risk for RA 1. By mapping and interviewing inside RW 04, 05 and 06, it turned out that the area is mostly prone to flood and lahar flood (c.f. Figure 23). Lahar flood in Yogyakarta is caused by former volcanic eruptions of Mount Merapi, located in the north of Yogyakarta. Intense rain during the rainy season can cause annual flood and landslide of slopes. Beyond that, even socio-economic processes like too much waste water because of urbanisation and industry can trigger flooding, as mentioned in interview 4. Even if this is only mentioned by one interviewee, it has high damage potential (interview 7). The last potential hazard named during the interviews was fire. Fire can lead to massive damages inside of the high-density communities. Even though mentioned as a natural hazard by the interviewees it has to be seen as a technical or man-made hazard caused by short circuits, firewood and waste burning.

To understand how detected natural hazards are influencing communities in Yogyakarta it is important to take a look at the changes that occurred in the investigated areas within the last years. Often the changes can be traced back to the impacts of natural hazards on the community level. Such changes can be found in particular along the riverside. Those areas are prone to flooding and have not been built-up in the past. Due to migration and population growth, leading to a bigger housing demand, those traditionally affected areas have been populated (interview 5). So the major changes in the last years were the construction of houses on the riverbank and the massive damages of the last lahar flood after Merapi eruption in 2010 (interview 7). But it is to say, that not only plots directly located along the river are affected by flood, depending on the flood intensity. Quite often, basic infrastructures, like public toilets, communal bathrooms, wells and springs are located directly in or near to the flood-prone areas. This leads to problems in water supply and waste water disposal as well as to pollution of ground water as facilities are not operating during flooding. Furthermore they can be clogged with fine sediments, like sand and lahar, as mentioned by interviewee 4.

Interestingly this is similar in RW 04, 05 and 06, so the location of basic infrastructures seems to be generally problematic. Except for public facilities, every private household, social infrastructure and business accommodation located inside the flood prone area is vulnerable to natural hazards, so much so that after last lahar flood in 2010, several housings were demolished completely and have been removed but houses were rebuilt afterwards. Others were damaged but could be reconstructed, as figured out in interview 5. To deal with the impact of natural hazards, especially of lahar flood, several response strategies were developed and implemented by the communities. In parts along the riverside, an embankment was built to protect the area against flooding.
To sum up, natural hazards have a major influence on the communities. Changes inside of RWs are traced back by interviewees mostly on the impacts of flood and lahar flood. Public as well as private infrastructures can be damaged massively by flood, landslide, man-made hazards, like fire or a combination of them. Inside of RA 1 is a directly flood and lahar flood affected area, located along the riverside of Code River. Other parts of RA 1, not located directly along the riverside can be affected severely as well, if kept in mind that mostly water supply and sanitation facilities are located inside of the affected area.

3.5.2.2 Strategies of local actors to cope with natural hazards in RA 1

As figured out in the chapter above, the main disaster risk results from lahar flood and flood. Therefore flood turns out to be the driver from the outside that exerts the most pressure on the investigated area in terms of natural hazards. In the following, the community responses or strategies to deal with these impacts on the community itself will be listed and explained. Communities of RA 1 responding with different types of strategies, divided into formal, informal and hybrid strategies, as well as into technical and preventive planning strategies. The most obvious strategy against flood in RA 1 is the wall embankment along the riverside.
of Code River that is supposed to reduce the flood risk (c.f. Figure 24). The wall is a hybrid project between local authorities and the neighbouring communities and was built during the 1990s. After the last Merapi eruption in 2010 it was heightened (interview 7). This enhancement was funded by the city government of Yogyakarta and implemented by the Indonesian military together with the local community. Besides the cooperating building of the wall, the embankment was partly heightened by the community itself in an informal way. This was especially done where the Indonesian military did not heighten the wall but in several segments, also if the local community thought that the embankment was not high enough (interview 4). The wall is constructed in a massive way, built of concrete and is partly reinforced but still offers access to the river in several spots. This is important for the local community because the river is used in everyday life by kids for playing, as well as for fishing but also for wastewater and waste disposal. In parts where the wall is heightened by the community it is often just a gabion filled with river sediments like sand and stone or even just sandbags. However, for interviewee 5 this is a kind of wall embankment as well.

Another response is the preventive planning of how to react in acute hazard situations. For that, an evacuation map with sketched routes and meeting points of every RW does exist (c.f. Figure 25). This is posted normally at the entrance to the RWs and in front of the community representatives’ offices. Those evacuation plans are implemented by signing the map drawn routes in the area in form of arrows and marked crossroads. In fact that the communities are located on a slope, the planning with its signed routes provides fast evacuation to higher ground in case of a disaster event like flood or earthquake. There are some differences between the RWs referring to the quality of evacuation plans. RW 06 can be seen as a best practice because it comprises of both, a good evacuation route with several local meeting points guiding to a central meeting point on a higher located level providing enough space for shelters and medical care. RW 06 also defines an evacuation hierarchy which prioritises
children, elderly and disabled people. Evacuation planning by mapping and signing is implemented by the community themselves but funded by local authorities (interview 7).

Up: RW04 with evacuation mapping in good quality
Down: RW05 with no identifiable evacuation map

Figure 25: Evacuation maps of RW 04 and RW 05 (own figure, 2014)
The third strategy to deal with natural hazards is an implemented early warning system. The early warning system is a kind of collaboration between communities located in the rural area, near Mount Merapi and the urban communities inside Yogyakarta. The interviewee of interview 4 said that the early warning system is implemented in form of a regular monitoring of Code River, which is organised by a selected group, called *Ulu-Ulu*. This group consists of members of every community along Code River up to the bottom of Mount Merapi. Their task is to monitor the rising water level and to provide this information to other communities. This is delivered through mobile devices to other members of *Ulu-Ulu*. With that it is possible to monitor the level of Code River permanently. As mentioned before RW 06 has a good evacuation planning and can be seen as a best practice. This results out of a strategy for disaster risk reduction, implemented in several communities of Yogyakarta by the “Disaster Mitigation Local Board” of the local government. The programme is called “Kampung Tangguh Bencana”, Resilient Kampung (interview 4) and aims to foster resilience to natural hazards. The programme is a kind of fund and shall ensure the development of strategies by specific monitoring, consulting options and financing projects. It is also important that the community has to organise the development completely on its own, starting by drawing an evacuation planning in combination with signed routes. Additionally, simulations of disaster events have to be planned and executed. Those have to involve communities as well as public hospitals, ambulances and the military (interview 4). However, interviewee 7 counters this statement by complaining that no simulation for flooding has been executed yet but instead of this, a simulation of fire event was executed. The programme is implemented purposefully into communities with disparities to strengthen the community itself and the surrounding ones.

In summary there are three types of responses on natural hazards:

- **Structural measures**: Wall embankment, gabions and sandbags
- **Evacuation planning**: Evacuation maps and signed evacuation routes
- **Early warning system**: Monitoring of water level and communication between local communities along Code River

All strategies aim at a direct participation of the local communities but no strategy can be indicated as entirely formal or informal, but as hybrid, carried out on local government as well as on a community-level. Although these responses are implemented inside the whole RA 1, there are distinctions considering the quality of implementation and maintenance of measures against natural hazards. Along RW 04 the flood protection wall is a massive construction without gabions or sandbags. Only in acute flood risk, the community prepares itself with sandbags to protect their homes and facilities. In contrast, RW 05 and RW 06 have also massive wall constructions but of a comparably lower quality and height. They use gabions and sandbags to heighten the wall. Concerning the evacuation planning it turns out that RW 04 and 06 have good evacuation maps, and good, visible signs of the route to safe meeting points, while RW 05 has an evacuation map as well, but with low quality drawings. Also, signed routes along the streets of the RW are not visible or implemented yet.

### 3.5.2.3 Impacts of socio-economic stressors and disruptions on community development in RA 1

Like natural hazards, socio-economic processes influence the community development in Yogyakarta as well. For interviewee 5 there are changes in RW 04 that can be traced back to migration into Yogyakarta in general and into RW 04 in particular. Migration goes hand in hand with population growth and an increasing housing demand, which results in high-density areas in RA 1. New houses are built wherever possible, often inside of the flood affected area. Moreover, the space along the riverbank is not legal building land. In the past,
those plots had the function of floodplains but now they are used for housing. Also, the floodplains are private land, belonging to the Sultan of Yogyakarta, which means that settlements are built on private land and thus informal. The Sultan accepts this, but the aggrieved parties have no chance to obtain a land certificate. This may result in conflicts if the Sultan claims his land for other purposes (interview 4). Another problem is the organisation of waste deposit. Waste is not disposed of correctly but often just thrown into Code River or on a brownfield. The waste deposit problem is probably caused by the growing population, lacking environmental awareness and ongoing tertiarisation inside as well as impacting the communities from outside of RA 1.

The process of tertiarisation influences the community development mostly by hotel planning. For interviewee 4 this comes along with both, positive and negative impacts. The community may profit of it by job opportunities or business cooperation. In contrast, it may also lead to conflicts inside the community, caused by increasing living expenses, a potential starting point of gentrification. Interview 7 revealed that the community is also afraid of possible hotel planning as it already led to conflicts in other Kampungs and RWs. Problematic as well is the high water demand of hotels. This may causes shortages for the local community, because hotels extract the local groundwater. In extreme cases, this may dry the wells as mentioned by interviewee 4. Another process of tertiarisation is the loss of local identity and traditional culture. However Yogyakarta profits from tourism and is a cultural and touristic centre that local communities have to deal with it. The challenge is to develop it in a symbiotic way (interview 4).
In summary, RA 1 is defined by processes of urbanisation and tertiарisation. This can be specified for urbanisation into increasing housing demand caused by migration and population growth, while the process of tertiарisation is induced by the hotel and tourism planning. In the following it is important to figure out what kinds of strategies have been applied to strengthen the community and create urban resilience against socio-economic risks.

### 3.5.2.4 Strategies of local actors to cope with socio-economic stressors and disruptions in RA 1

To deal with the detected influences inside RA 1, different kinds of strategies are implemented. They can be distinguished as formal, informal and hybrid. This means that strategies can be developed externally by local authorities (formal), internal by the community (informal) or as a hybrid form of both. Specified on the RWs of RA 1 there are no internal but several hybrid and some external strategies to deal with socio-economic processes.

Tertiарisation putting pressure on the community, as mentioned in the chapter above, can also be seen as an external socio-economic strategy to foster Yogyakarta City and their economy on a regional and national level (interview 4). To involve the community planning process and ensure a sustainable development, strategies to foster the collaboration of hotels and communities are developed. One part is the cooperation of small businesses with the hotel and the filling of vacancies with locals, which is already practised in RW 06 together with an outlying hotel. In practice, the small businesses have the possibility to offer their products in the hotel lobby or cafeteria (interview 4). But for interviewee 7 this is also problematic because he is afraid that the hotel and small businesses will improve the RW so much that it becomes too expensive to live. To mobilise all community members for this development, the Social Department of Yogyakarta City Authority organises trainings and workshops and gives loans for local start-ups. These trainings are especially addressed to households with low income. Interviewee 4 mentions that one concrete workshop was a “wedding make-up training, because for young women the wedding is one of the life’s most important things and is sustainable because people will always marry” (interview 4). Another strategy to develop RA 1 is to make use of tourism not by building hotels but by making the RWs attractive areas for tourists who want to see the traditional Yogyakarta. Interviewee 4 names the strategy as *Tourist Kampung*, including a greening and river cleaning programme. *Tourist Kampung* is understood as the implementation of eco-tourism by all interviewees. Different to the understanding of eco-tourism in Europe, in this case the phrase just describes the accommodation of handcrafts, traditional arts and the use of natural resources, like the river or the riverbanks for tourism attractions. “It is [...] necessary for developing the eco-tourism such as tubing, canoeing and rafting in the river” (interview 4). The cleaning programme is coordinated and funded by the local Environmental Agency of Yogyakarta and executed by the *Ulu-Ulu*, who are also monitoring the water level for disaster risk reduction. They are financed by the fund of the Agency. It is important to keep in mind that the cleaning programme of Code River is done in the form of a simple waste collection. To handle the waste inside of RA 1, communal composters and a waste dump are implemented in each RW of *Kampung Terban*. According to that, the principle of “reduce, reuse, recycle” was implemented by means of workshops within the community (interview 4). The strategy of greening RWs means the planning of green spaces along the riverside and on existing open spaces. Greening is mentioned by all interviewees as a strategy for the improvement of living conditions but could not be specified by them. Greening programmes can be interpreted as simple measures of planting along the riverside. However, no socio-economic strategies to strengthen the community’s social infrastructure deal with the implementation of new education or medical support facilities. In RW 04 and 06 nurseries already exist but not yet in RW 05.
The strategies mainly aim at the community development by business improvement with the hope that it benefits the improvement of quality of life as well. In short the strategies are:

- **External strategies:**
  Hotel planning and tourism development in Yogyakarta, funding of start-ups

- **Hybrid strategies:**
  cooperation between hotels and small businesses, environ-mental management, workshops for community members

![Figure 27: Small Business for daily needs in RW 04](own figure, 2014)

### 3.5.3 External impacts on RA 1

As figured out in the previous investigation, there are natural hazards as well as socio-economic processes from outside that are influence the community development of RA 1. Those detected drivers can be evaluated according to the community's perceived level of affection. Regarding natural hazards, the major impacts are flood and lahar flood (c.f. Figure 23). Flood occurs periodically and leads to massive pressures and risks on the affected settlements. Reasons for flood are volcanic eruption (lahar flood) and intense rain (‘normal’ flood). Intense rain, in combination with steep slopes that are built-up or cleared from vegetation without paying attention to the water runoff, may also induce landslide. This means that the upper part of the slope ground can slide down to the riverbank, spilling buildings, infrastructure and inhabitants. Areas prone to landslide are mapped only in the evacuation plan of RW 06 but are not mentioned by any interviewee, which can be interpreted that the communities only feel slightly affected by landslide. The same case turned out to be for potential earthquakes. It is an obvious risk but people in the investigated area do not seem to be aware of it or do not regard this as a major risk. Most strategies on
natural hazards are responding to flood. The most obvious one is the wall embankment along Code River. Another response is the evacuation map and the signing of evacuation routes along the streets. They guide the community to a higher, flood-safe ground. In RW 06, this evacuation plan also includes a hierarchy of evacuation, listing children, elderly and disabled person as the first to be evacuated. Of course those evacuation maps can be used also in case of other hazard events mentioned above, but during the interviews they were just mentioned for coping with floods.

Regarding socio-economic processes from outside, the major challenge is how to deal with the ongoing urban development. Yogyakarta itself is dynamically growing due to natural growth and rural-urban migration. Migrants move into the communities to benefit from urban characteristics, like more job potential. This leads to conflicts because, along with the increasing population, is the increasing demand of housing units.

Another process is the intensified tourism development of Yogyakarta. The city, as the centre of Javanese Culture, develops tourism strategies on the city level with impacts on lower administrative levels. Although those strategies focus on the tourism-marketed inner city they affect the local communities of non-touristic areas. One result is an increasing tertiarisation, viewable by the planning and building of hotels inside of Kampung Terban. The combination of densification and tertiarisation probably maximises costs of living and housing, major triggers of gentrification. Interviewee 7 is very afraid of it and the other interviewees feel affected as well. Going hand in hand with this is the maximised demand on natural resources, like water demand, energy supply but also building ground or waste disposal. The hotel planning is an external process for the community itself but also can be seen as a strategy on city level coincidentally influencing the investigated area. To deal with that, several hybrid strategies were developed and taking place inside of Kampung Terban. By cooperation between hotels and small businesses the community’s economy can be fostered and benefit from planned hotels. Hotels also may offer new job opportunities for Kampung members. To improve the quality of life, the community tries to install environmental management schemes. This means in particular the cleaning of Code River twice a month, and the responsible handling of waste material by the 3R-principle: reduce, reuse, and recycle.

Processes from outside can be summarised as:

- **All natural hazards:**
  Volcanic eruption, intense rain, (lahar) flood, landslide and earthquake

- **Socio-economic processes:**
  urbanisation (migration and densification) and tertiarisation, potential starting of gentrification

### 3.5.4 From impacts to responses in RA 1

In the following chapter a short evaluation of the investigated responses shall be given. With regard to the research frame it is important to know how the community evaluates processes, impacts and responses and how satisfied it is with that. The best strategy on natural hazards won’t be implemented if there is no awareness and acceptance of the affected people. In addition to that, strategies will not work if not implemented in a sufficient way. In chapter 3.5.2 the influencing processes were investigated and responses implemented were analysed. It turned out that RA 1 in particular is driven by processes related to natural hazards and socio-economic processes, influencing the internal development of the communities from outside. To handle the perceived drivers, responses belonging to all three categories were developed (c.f. Figure 29).
Namely, strategies can be classified into three parts. There are strategies aiming at Disaster Risk Reduction of harmful processes impacting the community. Then there are strategies responding to socio-economic risks. To describe the responses on socio-economic processes the strategies found are divided into the categories of environmental management and socio-economic development.

In chapter 3.5.2.1 it turned out that the most significant natural hazards are flood and lahar flood. Other detected hazards are volcanic eruption, intense rain, earthquake, fire and landslide. Despite their non-deniable hazard potential they are not perceived as potentially harmful to the community. Referring to interviewee 5, the reason for change in the last years can also be traced back to the occurrence of floods, because households in the affected area were damaged. It is important to keep in mind that the area along the riverbank of Code River is traditionally flood-affected, and for this reason was not inhabited in former times - not until ongoing urbanisation and densification led to the construction of houses in the flood-prone areas. However, the interviewees claim the reason of affection to be natural hazards themselves, not to the housing in the traditionally prone area. A definite result of flooding was the construction of a protecting wall embankment along the riverside. Chapter 3.5.2.2 figures this out as major strategy against flood (c.f. Figure 24). The quality of the embankment depends on the RW it is built in. All embankments are funded by the local government and realised by the Indonesian military in collaboration with the local communities. However, in RW 05 the wall is of minor quality compared to the parts belonging to RW 04 and 05. It was also mentioned that in some parts the wall was heightened by the community itself in an informal way, posing questions about its stability. In RW 04 and RW 06 this is realised massively with concrete, inside of RW 05 it is just done by gabions and sandbags (c.f. Figure 28).
The second strategy to deal with natural hazards is the evacuation planning: a two-step strategy, implemented by an evacuation map and by signed routes through the RWs. The evacuation maps include the type of natural hazard, basic infrastructures like mosques and offices for the community representatives, evacuation routes and meeting points. The signed routes are realised by marking crossroads inside the RWs with red arrows guiding to higher located areas. Also the evacuation plan is realised in differing qualities. RW 06 has a well-drawn map and signing. It is the only map inside RA 1 that mentions all potential disasters. Also it is well-planned that evacuation routes first lead to local and after that to a central meeting point with enough space for shelters on it. RW 04 has an easily understood map, as well, with simple evacuation routes that guide rapidly out of the affected area. It must be noted that no other potential disasters are mapped. The evacuation planning in RW 05 is of comparably lower quality. The map is badly drawn and not easy to understand, as well as that signed routes are missing or not viewable. The last strategy figured out against natural hazards is the network of *Ulu-Ulu*, an early warning system, where one person in every community along Code River up to the base of Mount Merapi is responsible for monitoring the river level and providing the level to the other responsible person.
Evaluating the strategies for disaster risk reduction it can be indicated by the state of the interviewees on how satisfied they are with the implemented strategies. Interviewee 5 mentioned that he is quite satisfied with the strategies implemented in his community. But he also mentioned that he thinks the disaster risk has to be reduced even more, by further heightening the protection wall. For him, the embankment should have been heightened more and even the informal elevation is still not enough. This is somewhat contradictory to the statement that he is satisfied but may be understood in the context of potential consequences of an occurring flood. For the interviewee, a sustainable strategy in the future could be to lift up the houses located along the riverside. In his vision the houses are put on stilts to reach the elevation of houses built behind. However he was not able to specify how to realise this. In interview 6 it turns out that the community representative does not know if he is satisfied at all. Unfortunately, it cannot be said with certainty whether the interviewee did not get the question right, if he really did not know if he is satisfied at all or also did not want to mention any sort of critique. It must be considered that criticism in Indonesia is interpreted as impolite, and with that, people often do not mention anything negative. Although there are deficits in the quality of evacuation planning, the interviewee accords with interview 5 that the wall is not high enough and also should be improved in terms of quality of construction. RW 05 has the biggest deficits responding to natural hazards. Instead of heightening the wall massively by concrete, it is just done by gabions, which can provide a comparably low level of protection if constructed in a poor way. A site inspection in fact poses questions of the gabion quality (c.f. Figure 28). They also could develop a new evacuation map and correctly signing the routes, that is done fast, cheap and which could be executed by the community itself. But instead, for the representative of RW 05 the local government has the duty to optimise the strategies. The strategies of RW 06 they can be seen as the best implemented strategies in RA 1. This probably results out of the programme resilient Kampung by the “Local Disaster Mitigation Board”. Wall embankment, evacuation map and signed routes are in good conditions and seem to be well maintained. Interviewee 7 figured out that the community of RW 06 is very satisfied with the development of responses on natural hazards but for him the wall could be even more heighten.

During the investigation, it turned out that inside of the investigated areas life quality is tried to improve by implementing environmental management, which includes strategies to maintain the quality of open space. In chapter 3.5.1.1 it is described that waste disposal and sanitation is mostly done by dumping into Code River. One aspect is the non-aesthetic structure of open space, especially along the riverside but the more important one is the fact that the uncontrolled disposal of waste and sewage leads to minor living conditions by endangering the health of communities and environmental degradation of river environments in RW 04, 05 and 06. Interviewee 4 mentioned that a cleaning river event is done twice a month. This is realised by the removing of waste in Code River. Plastic materials are dislodged along the Riverside. Responsible for the execution are the former described Ulu-Ulu. Another environmental management programme is the 3R-principle. ‘Reduce, reuse, recycle’ is aiming directly at the households of RA 1 and tries to manage their handling with waste materials. However, those strategies are both implemented already inside of RA 1 but are obviously not working successfully. The river is polluted by plastic packing and contaminated by sanitation. The dumping of waste and sewage is even mentioned as a strategy by interviewee 4. Even though the sewage is filtered of particulate materials it is not acceptable to dump it into the river. Regarding the evaluation of environmental strategies by the interviewees, the success cannot be indicated because none of the interviewees evaluated the strategies of environmental management. This can be due to the fact that the strategies are working very well and are totally implemented in daily routine or the opposite fact, that people do not see the waste and sewage disposal as a problem they should face up. Unfortunately, most likely option two is the realistic one. Community members even do not seem to notice the indicated problems. Chapter 3.5.2.3 focused mainly on the socio-
economic processes in RA 1. Main processes detected were urbanisation and tertiariation. Urbanisation takes place in the form of migration and population growth and results in an increasing housing demand. Migration occurs because of urban-rural dynamics, which means that job opportunities and the facilitated access to social infrastructures leads to an in-migration from rural areas. Together with the natural population growth, this results in the increased housing demand and high-density communities. The informal housing along the riverside on private land, belonging to the Sultan of Yogyakarta, is another result of the scarcity of buildable land. This area was, furthermore, traditionally not settled because of being prone to flood. However, the housing is tolerated by Sultan and authorities but may lead to conflicts in case that the ground is needed by the Sultan, for example for hotel planning. In such case the settlers might be forced out.

The other main process figured out is an ongoing tertiariation inside of RA 1. The local government of Yogyakarta is fostering the tourism development by hotel planning and marketing Javanese culture. This results in an increased hotel planning, also inside of Kampung Terban. As mentioned by interviewee 4, brownfields are often sold to investors focusing on the planning of hotels. Challenging is the fact that RA 1 mostly accommodates small businesses for daily needs and foods, which makes RA 1 vulnerable to outside economic processes impacting on the area. Those small businesses are mostly not resilient to pressure of bigger economies and affected on structural changes. In combination, urbanisation and tertiariation can induce gentrification processes impacting the communities of RW 04, 05 and 06. The interviews figured out that all respondents are very afraid of gentrification. In Chapter 3.5.2.4, strategies were separated into external and internal ones. External strategies are developed on a higher level of administration and formal in an Indonesian context, while internal strategies are directly developed by RWs and have to be understood as informal. Besides, there is a level of combined strategies, developed and implemented by local authorities together with local communities. According to that, the formal strategies were figured out as strategic hotel planning, tourism development in general and in funding start-ups, located in RA 1. Hotel planning was mentioned already as socio-economic process impacting on the communities, however it is a process resulting from the strategy to foster tourism and hotel industry in Yogyakarta City. However this comes along with pressures on the local communities and the related small businesses. To strengthen the economy inside of RA 1, the local government supports start-ups by funding them at the beginning. Another strategy to foster small businesses is the induced cooperation between hotels and local economies. In practice the small businesses have the opportunity to offer their products inside of the hotel lobby or to run the cafeteria. Also hotels offer a number of jobs to the local community. Besides that the third hybrid strategy is the organisation of workshops for community members by the social department of Yogyakarta. The workshops aiming at low-income households and shall develop know-how to found small businesses. Remarkable is the fact that RA 1 has no internal strategies developed or implemented yet. Unfortunately there is also no strategy to enforce further improvement of social infrastructures in parts of education and parenting.

The evaluation of the strategies for socio-economic processes, based on the states of success by the interviewees is difficult to name. A big problem can be the lack of knowledge of socio-economic processes and their impact on the community. Except of interviewee 4, the other respondents are always referring on the strategies against natural hazards but could not name strategies to the response on socio-economic processes. However, the opinion of interviewee 5, 6 and 7 can be interpreted as negative. They are afraid of the ongoing hotel planning, because it might lead to a revaluation of housing areas around of the hotels and the community cannot manage the rising living conditions. The problem of evaluating the strategies on socio-economic processes is that most of the strategies are implemented quite recently because processes like gentrification are highly dynamic and new appearances.
In conclusion the local transformation and response on it is differs in RA 1. The strategies against natural hazards, implemented in RW 04 and 06 are in general satisfying. The wall is built massive and is reinforced by the community so that it can be seen as a good response against lahar flood. However, the interviewees inside of RW 04 and 06 are not sure whether this protection is enough. This state can be understood because of enormous pressure, created by the potential danger and consequences due to flood and lahar flood. The other well-implemented strategy is the evacuation planning. Maps and signed routes inside of RW 04 and 06 are plain and posted visible in central locations. Other strategies, like the vision of interviewee 4 to lift up the houses, located along the riverside, cannot be realised and have to be seen as utopia.

<table>
<thead>
<tr>
<th>Type of strategy</th>
<th>Quality of implementation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Wall embankment</td>
<td>++</td>
</tr>
<tr>
<td>Slope-stabilising</td>
<td>~</td>
</tr>
<tr>
<td>Evacuation Planning</td>
<td>+</td>
</tr>
<tr>
<td>Early warning system</td>
<td>+</td>
</tr>
<tr>
<td>3R-principle</td>
<td>+</td>
</tr>
<tr>
<td>River cleaning</td>
<td>++</td>
</tr>
<tr>
<td>Water supply</td>
<td>+</td>
</tr>
<tr>
<td>Vertical housing</td>
<td>~</td>
</tr>
<tr>
<td>Tourism development</td>
<td>~</td>
</tr>
<tr>
<td>Funding start-ups</td>
<td>+</td>
</tr>
<tr>
<td>Small business development</td>
<td>+</td>
</tr>
<tr>
<td>Business Cooperation</td>
<td>~</td>
</tr>
<tr>
<td>Workshops for community</td>
<td>+</td>
</tr>
<tr>
<td>Education</td>
<td>~</td>
</tr>
</tbody>
</table>

++ good  + acceptable  - bad  ~ no implementation

Table 2: Evaluation of strategies in RA 1
(own table, 2015)

The state of strategies inside of RW 05 can only be considered as negatively and risky. Particularly problematic is the perception of the interviewee which prevents the community of a resilient development. Interviewee 6 mentioned that it is not their responsibility to strengthen the wall and implement strategies against natural hazards but the government would have to. Same has to be said in case of the evacuation planning. Only a very low quality evacuation map exists and the possible evacuation routes cannot be identified. This is somewhat irresponsible and has to be questioned because, as shown in RW 04 and 06 it is possible to strengthen the existing arrangements by the community and create a solid resilience on flood and lahar flood. RW 05 should rely on the other two communities in RA 1 and see them as a best practice example of creating resilience against natural hazards. Going
on with the detected influences by socio-economic processes and their responses, the strategies are not figured out well. There is no arrangement to deal with the potential beginning of a gentrification. However, this might be hard to respond to as tertiarisation is caused by an improved tourism development of the local government. In summary the responses to reduce disaster risk are acceptable and according to lahar flood and flood even satisfying. In the opposite, strategies to control socio-economic processes and organise environmental management are much less considered and have to be improved. To cope with this, support by economic actors, authorities on all administrative levels and the entire communities is needed.

3.6 Assessment of Research Area 2

Author
Stefan Niederer

3.6.1 Introduction

In this section, surveyed qualitative data was analysed and an evaluation and characterisation of dominant conditions and specifications in the Research Area two (RA 2) will be emphasised. The research group in this area conducted eight interviews with different RWs and RTs. RA 2 is located in the centre of Yogyakarta City, close to the main shopping street Malioboro, in the west of Code River in the Kelurahan Suryatmajan. The main study area for RA 2 was a Kampung of Kelurahan Tegal Panggung in the sub-district of Danurejan. The boundary for this area is the railway in Kelurahan Kota Baru in the north, in the south Kelurahan Purwokinanti where RA 3 is located and in the west Kelurahan Suryatmajan.

The area size of Kelurahan Tegal Panggung is about 35 hectares. It is split into 16 RWs and 66 RTs and the population is estimated to be about 10,000. For gaining in-depth data, only the marked areas (c.f. Figure 32) of the Kelurahan Tegal Panggung were investigated, meaning one-third of the entire area of the Kelurahan, as the size of RA 2 did not permit an area-wide investigation. RA 2 is located in the east of Code River and densely populated. A small walkway reaches along Code River from north to south where plenty of wells are situated. This small walkway is only interrupted between RW 03 and RW 13, with a bridge where the street is connected with the Kelurahan Suryatmajan (c.f. Figure 30).

Houses in RA 2 are built densely and located close to Code River. Only the walkway is between the houses and Code River and at most places a wall embankment for flood and lahar protection was built up (c.f. Figure 30). This protection wall is like the walkway, only interrupted by bridges and in the south in RW 14 where the slope-stabilising structure is situated. From the lower slope to the elevated area a construction of concrete and steel-strutting in the interior was set up for stabilising the slope. It protects against occurring flood, lahar flood and intense rain, but the first rows of houses had to be cleared for that reason (c.f. Figure 31).
It should be mentioned that only the first three rows of houses are situated at a flat level and the other houses are built on a higher elevated level of the slope, which is a unique characteristic of RA 2. From north to south, in RA 2 it is visible that after the first three rows of houses the slope gets steeper and the houses are situated on a more elevated terrain, but it could not be examined why there is such an elevation. The manifest reason for that is that Code River dug off the land over centuries. All of the northern interviewees mentioned that in former times a kind of bamboo forest was located along the riverside and people used to only live in the elevated areas. In the southern part of RA 2, houses on the flat level were cleared to make room for a slope-stabilising structure to gain more protection against different kinds of flood. After interview
8, in RW 01 RT 02 it became obvious that the non-existence of brownfields is one particularity of RA 2. In contrast, such urbanisation and touristic processes can be found on the western side of Code River in Kelurahan Suryatmajan where a hotel will be set-up on a brownfield. Interviewee 8 also mentioned that the community is against such a hotel in their area. All streets in this area are paved, even though there is a high elevation gradient from the river until the middle of the Kelurahan.

3.6.1.1 Basic infrastructure of RA 2

One of the aims of the conducted interviews was to make the interviewees map areas of their special interests and local infrastructures. For further evaluation and for validation of their answers the research group investigated and mapped areas of special interests as well. After that it became obvious that for the community the most important local infrastructures are water supply and sanitation, because they are important parts of the basic services and both of them occur mostly at the same places. The research group focused on the identification of public wells, which are of importance for maintaining the water supply for the community. Beyond that, it was not possible to locate and map every well in RA 2 due to the large number of hidden places. In addition, there are some houses with a private well and a connection to the local water pipe, which is run by the government. It was found out that only the higher elevated houses have access to this local water pipe. Due to the number of nominations by the interviewees, mosques were identified as the second most important local infrastructure, because water supply and sanitation facilities are mostly located near mosques and they could be found in every RW at exposed and easily accessible places. This is based on the Muslim background of the country and the ceremonial washing before every prayer. Further, the only elementary school and childcare in the entire RA 2 was found in RW 13. Additionally only interviewees in RW 13 mentioned that they have healthcare provision in their community. Additionally, interviewee 9 asserted that such social-infrastructures are not allowed within the area but in the neighbourhood. In RA 2 only one place located in the north in RW 02 was identified as waste disposal place, but it was not obvious why the interviewees mentioned only one official place for waste disposal in the entire RA2. Apart from that, interviewee 8 noted that they can bring their waste to the nearby market but interviewee 9 mentioned that residents deposit their waste in Code River. Thus, a person who doesn’t bring his or her waste to an official place deposits it into Code River. Most of the people marked Code River itself as an area of special interest. This means that they use it for washing, bathing, fishing and as well for waste disposal (interview 9). However, this is a negative habit that indicates that the residents pollute environment around Code River and cause higher vulnerability to diseases and contaminated food.

Besides that, interviewees in the southern part near to the main roads outside of the RWs marked it as an area of special interest, because they can sell their goods and food there. Especially people in southern RWs marked the RW 14 as an area of special interest, which is coined due to crime and the vertical housing at the border of RW 14 and on the other riverside. During the interviews, a correlation between vertical housing and crime could not be found out. Mostly people from outside moved into this area due to the vertical housing and available living space. However some people mentioned that the residents that have moved in are not integrated in the community life and in some ways different compared to the long-established residents. The important infrastructures of RA 2 can be listed as:
Urban Resilience in Indonesia

- **Technical:**
  public or private water supply and sanitation and waste disposal
- **Religious and social:**
  mosques and elementary school and healthcare
- **Community:**
  offices for area representatives, doctors, public space and vertical housing

Figure 32: Location and basic facilities of RA 2
(own figure, 2015)
3.6.2 Transformative processes and responses in RA 2

3.6.2.1 Influences of natural hazards on the community development in RA 2

By mapping and interviewing in RA 2, it was revealed that distinctive changes happened in the northern part of RW 01, 02 and 03, which have always been an acutely flood prone area due to the river course (c.f. Figure 34). Until the 1990s, an aggregation of bamboo and other vegetation used to be east of Code River. This vegetation was cut due to urbanisation processes induced by a growing population and settlement pressure with a resulting shortage of available free space for housing. But none of the interviewees could indicate if it happened informally or formally. Apart from that, the clearances of private gardens around the houses were also the result of the growing population and settlement pressure (interview 8). Thus, the necessity of more space for a growing population and densification in this area affected the former bamboo aggregation.

During this time, the wall embankment was renovated. As a consequence, people started to build their houses in this flood prone area due to the fact that they now had the courage to build so close to the river. This wall embankment protects households better from flood and lahar flood. The government initiated to take more care about the new settlement area by building and subsequently renovating the wall embankment and as a reason the area with their buildings was gradually upgraded in the point of view of the residents (c.f. Figure 33). Thus, the improved protection against specific natural hazards and hardly any free space for new buildings made the people live close to the river and not on the elevated areas anymore. The result is that the community is more likely affected by natural hazards than before, namely flood and lahar flood. Anyway, the interviewees indicated these changes were based on a better accessibility, because the dense bamboo vegetation provided only little access to the river.

Furthermore, during the 1990s, houses were renovated and most of them changed the building material from wood to concrete. Subsequently, in the opinion of the research group, the clearance of the bamboo had possibly the consequence that the community lost their former building material and they needed to change it from wood and bamboo to a concrete building construction. These circumstances seem obvious, but it is only a hypotheses and not empirically well-grounded as the interviewees hardly emphasised on this topic.

The described changes implicated that the community is now safer against fire, because of the tight construction of the wooden houses it was more likely that they were affected by fire. But the tight construction is still an acute source of risk as the still on-going urbanisation processes within huge settlement pressures forced the residents to preserve their tight construction. Basically after changing the building material, local residents are more protected against natural hazards. Some interviewees in the northern part mentioned as well that houses, which are renovated and built with concrete, look more elegant and that the area was consequently upgraded (interview 12).
Interviewees 14 and 15 mentioned that the river course changed due to the excavation at the undercut slope and the following sedimentation on the eastern side of the river. The last extreme lahar flood occurred in 2010. At this time most of the three rows of houses and the wells and toilets near to Code River in the northern part of RA 2 were affected (c.f. Figure 34). Although the wall embankment worked, the biggest problem was that the lahar was pressed through the drainage system into the concerned area. So it can be said that if a flood occurs, most of the non-elevated areas in the northern part will be affected due to the clearance of the bamboo, as the retention area was removed. In the southern part, a pedestrian bridge over Code River in RW 14 was destroyed during the last lahar flood, but the community was against rebuilding this bridge, because they argued that they do not need it anyway (c.f. Figure 35).

Additionally, vertical housing units are located at the slip-off slope on the western side of Code River. They were intensely affected in 2010 because of the huge embankment on the eastern side. Generally, the undercut slope gets more affected by a lahar flood, but due to the slope-stabilising structure in RW 14, the flood was derived by geo-physical processes to the western side of Code River. Due to these processes, the vertical housing west of Code River in Kelurahan Suryatmajan was badly affected. In contrast, RW 13 was hardly affected by the flood, even though they are more vulnerable due to the lack of huge embankments. The concrete base of the bridge between RW 03 and 13 protected them from the spill over of the northern part and served as an embankment as well, as can be seen in Figure 30.

In summary natural hazards have a major influence on the local community and led to changes of all RWs. The detected natural hazards can damage public and private infrastructure and areas along Code River are likely more vulnerable. Areas on a more elevated land are barely affected by natural hazards but their water supply and sanitation facilities are located in the affected areas.
Figure 34: Flood prone areas in RA 2
(own figure, 2015)
3.6.2.2 Strategies of local actors to cope with natural hazards in RA 2

After all of the interviews were conducted it was revealed that flood and lahar flood are the major natural hazards in RA 2 and were induced mostly by intense rain and intensified by several socio-economic changes. They influence the entire area and a couple of strategies to deal with these natural hazards were detected during the interviews. The strategy for the northern part is to have a continuous wall embankment protecting the community against flood and lahar flood. This strategy reduces the risk that households get flooded. In the past, the embankment was continuously renovated, adapted and heightened, thus it is a hybrid strategy that was induced by the government. They provided the money for the construction and local people were involved in building it up. The last adaption happened three years ago and the embankment is now almost up to two meters high metered from the river course during the dry season (c.f. Figure 33).
All interviewees who mentioned the embankment in the interview believe that this strategy useful because the embankment worked and was stable during the last lahar flood. Nevertheless, the community mentioned negative side aspects about the embankment as well. Since the last increase it is harder for them to get access to the river for swimming, bathing and fishing and waste deposit into the river is more complicated. But like mentioned in chapter 3.6.1.1 the waste deposit into Code River should be stopped anyway. Further strategies, which provide a temporary protection, were introduced informally. They include the construction of small protection walls to heighten the embankment, and during the rainy seasons, things such bricklaying is done in front of the houses to inhibit water spilling into it. In addition, prepared sand bags filled with lahar material are then put on the embankment and on the small protection walls to heighten it. The available sandbags and the embankment, which is renovated and increased as well, are most the prominent protective measures for the southern part (c.f. Figure 36).

Figure 36: Prepared sandbags in RW 03
(own figure, 2014)
In addition, interviewee 13 mentioned the existence of a formal communication network (Ulu-Ulu) with other Kampungs further in the north. They communicate via mobile phones and warn the areas in the south that the flood or lahar flood will occur shortly. This way they gain a little time to evacuate people out of the hazard zones. The disaster-risk manager of RW 14 mentioned an informal but traditional strategy to cope with natural hazards. He explained that there exists a kind of spiritual person that “talks” to the volcano, and as a result he can tell if a flood or lahar flood will occur, so he is a kind of early warning system. In fact, some people attach great importance to his opinion and even reject official early warning systems.

Besides that, there is an official siren in the vertical housing but the community is against it, because according to them, this siren does not give accurate information about the floods. The most obvious strategy to cope with natural hazards in RW 14 is the slope-stabilising structure, which provides the most effective protection against flood and lahar flood because no houses on riverside level can be affected anymore. Additionally, houses on the slope-stabilising structure are better protected against landslide while it is raining intensely (c.f. Figure 37).

But as mentioned in the section before, this slope-stabilising structure increased the damage to the vertical housing on the other side of Code River. Furthermore, due to this construction, houses near to Code River need to be cleared, but houses in RW 13, which are next to Code River, are built in stages to gain more protection.
In summary, different types of responses to natural hazards are:

- **Structural measures:**
  - wall embankment, slope-stabilising structure, sandbags and temporary protection
- **Early warning systems:**
  - formal communication network, informal spiritual person and siren on vertical housing

3.6.2.3 Impacts of socio-economic stressors and disruptions on community development in RA 2

Certain socio-economic processes arise as a consequence of natural hazards and processes from outside and are influencing the community development in RA 2. Those mentioned influences in chapter 3.6.2.1 are additional drivers for socio-economic processes and urbanisation, thus they induced the clearance of the bamboo. On the one hand, that improved the community’s living conditions, because of the chance to build up own houses but on the other hand they are more vulnerable against natural hazards, because many families now live closer to Code River and the community lost its retention area. Additionally, interviewee 9 mentioned that there used to be a couple of craftsmen in former times, which used the bamboo as a raw material, but they vanished. Hence, it could be likely that they lost due to the clearance their raw material and subsequently their source of income. In addition, interviewee 11 mentioned that the government has some plans to improve the area next to Code River where the small walkway is situated. The interviewee explained that he evaluates these plans critically but he was not able or willing to give further information about those plans.

The southern part of RA 2 is more dynamic than the northern part. Interviewee 12 mentioned that the government should revitalise the riverside and a city garden should be build there. But that is not possible for now, because the first row of houses would need to be cleared in order to make way for an open green space, however, the house owners would not accept that decision. Interviewee 14 mentioned that the residents are unable to take action because they do not have any land certificates and have occupied the sultan land (*Magersari*) or state land (*Wedi kengser*) for more than 20 years. The residents tried several times to submit the application for buying the land but they will not get one, because the area here is already sold to become a hotel. That is a really sensitive topic and these differences between the government and residents brought up lots of conflicts and worries (Interview 14). In RW 14 the renovations and improvements of old buildings were caused by the need of its inhabitants. Due to the population density and population growth, residents were forced to renovate and improve their houses because more people live inside the house than before. They also built a place for public gathering called “*Balai RW*”, in particular to discuss important topics in the RW. The interviewee mentioned that the people are satisfied with the changes, because the area looks neater and the community life was improved by the place for public gathering.

However, the most obvious processes happened in RW 14 due to the construction of the slope-stabilising structure. As mentioned in chapter 3.6.2.2 the river course changed and the undercut slope on the eastern side was affected by erosion. The construction of that slope-stabilising structure gives this community the best protection against several natural hazards but to realise this project a couple of houses needed to be cleared. Regardless, the community still agrees that their lives are improved. In addition, RW 14 is the only area in RA 2 where vertical housing is already built up. This strategy for gaining more space for living brought up several conflicts between the community and the government because an elementary school and a football field were cleared. The community got upset because they got no substitute and the government forced them to move into the vertical housing which they can rent from the government for at most six years. If they succeed, the government
will build another vertical housing unit (interview 14). Furthermore interviewee 14 was sure that if there will be more vertical houses in this Kampung the community will be weakened and separated into two groups because the new residents are not participating in the established community traditions.

In summary, RA 2 is determined by processes of urbanisation and in some cases of tertiarisation. Urbanisation can be specified into an increasing housing demand caused by population growth and settlement pressure which results in land status conflicts. The processes of tertiarisation are hotel development and tourism planning. For that reason, different strategies have been applied to strengthen the community and to create urban resilience against socio-economic processes.

3.6.2.4 Strategies of local actors to cope with socio-economic stressors and disruptions in RA 2

To deal with the detected socio-economic processes in chapter 3.6.2.3, several strategies were implemented in RA 2, which can be subdivided into formal, informal and hybrid strategies. Three of all four detected strategies occur only in the southern part of RA 2.

The community in RW 14 fought against the construction of more vertical houses and they formed a community citizens’ initiative called PMPS (Perhimpunan Masyarakat Pinggiran Sungai). They enforced an audience with the government in 2009 and the Yayasan Yoga Kita which was in charge of the Rusunawa-Project. Their head was the crown prince of Pakualaman who will be the candidate for the vice mayor of Yogyakarta. The community finally agreed with the head of the project that the project be stopped. As a consequence, there will be no more vertical houses in that specific community for a certain time. It is not secured that this promise will last into the future, because if there will be a new leader the project could be continued, as the land is already sold (interview 14).

RW 13 applies strategies for economic development. Due to economic development in the surrounding areas, this RW was up-valued and people are seeking this spot because economic hotspots are nearby. For this reason, their food stores and business could grow and expand fast and more potential customers from the Malioboro Street should come to this site (interview 13). Additionally, a further strategy is to start renting out parts of their houses and to build guesthouses. As a result they now have their own small businesses and other people from the community could start to build up their own, because it is likely that more and more customers from outside will come to this area. This process might lead to the start of gentrification, but none of the interviewees mentioned such movements and they are not afraid of it for now.

The southern RWs developed the informal idea to establish a green canopy walkway at the small sidewalk next to Code River where houses were cleared for the slope-stabilisation structure. According to interviewee 14, the government wants to make Code River a tourism attraction with boats. However, Code River cannot be dammed and used for such intensions. The community of RW 14 was strictly against that and want to implement their master-plan with a green canopy walkway. This plan has not been implemented yet but will be done stepwise to change the area to a tourist spot (interview 14). He mentioned additionally that this area already introduced a kind of greening process of their Kampung. In addition, informal environmental strategies evolved out of the community to improve the living conditions (interview 14). Applying this strategy means that the government made the plans and provides the required money for revitalisation of the riverside and recreation areas, but the community in RA 2 is forced to implement it on their own. The problem is that some house owner will not accept the plans, because they would lose some of their properties.

Further movements for life improvement are organised and periodic cleaning of Code River and a waste collection place are undertaken. Approximately every second month Code River will be cleaned and the incremental stopping of waste deposit in it will lead to a cleaner
environment for the community. These strategies started five years ago and evolved completely out of the community. But they had to start with these movements, because the incorrect waste deposit started to affect the reinforcement inside the concrete slope stabilisation structure (interview 14). Besides that, in the northern part, no strategies were applied to stop the loss of the craftsmen (described in chapter 3.6.2.3) and none of the interviewees had an answer for that.

Socio-economic strategies are:

- **External strategies:** planning of hotel and vertical housing
- **Internal strategies:** local tourism development, launching small business
- **Hybrid strategies:** environmental management and greening process

### 3.6.3 External impacts on RA 2

In this section of the report processes and strategies described in chapter 3.6.2 will be evaluated and linked to driving forces from outside. The major external natural processes influencing on the area are the periodic occurring flood and lahar flood, which leads to massive pressures and risks on the affected settlements. But after interviewing the community chiefs, it became obvious that they arrange their lives with these natural hazards in mind and only feel slightly affected by them. Therefore the focus will be on the socio-economic processes, which are or will be influencing RA 2.

For the northern part, no actual on-going processes from outside were detected but interviewees 9 and 11 mentioned that future conflicts within the *Kampung* are likely. They suspect that the government wants to set up a hotel to up-value the entire *Kampung*. But they cannot do anything because most people in this area are only renting their place and thus they do not have a voice in this matter. These processes are comparable to those for residents in the south of RA 2. Interviewee 9 explained that in his opinion vertical housing would be built in his area in the next ten years due to the ownership structures. Interviewee 11 hopes that no one will be allowed to deposit their waste in Code River in the future and that the riverside will be revitalised. Nonetheless different circumstances prevail for the southern part of RA 2.

For Interviewee 13 the economic development and the increase of wealth are crucial process from outside. They are longing for government trainings especially for people from the lower and middle class to sell different goods and to get better-endowed loans. For the development of RW 14 the vertical housing is a strategy, which is dependent on external processes. Plenty of non-residents of the community moved to this area and weakened the social structures within the community. All that happened was due to the government policy and the need for more houses without an inclusion of the local community is what led to several conflicts. None of the interviewees was able to mention why especially this part of RA 2 was chosen for the construction of the vertical houses. In former times, this neighbourhood was coined due to crime and this may be one reason why the government chose to upgrade this site.

Interviewee 15 declared that generally vertical houses could be a good way to manage the growing population. However he noted that the vertical houses will always be based on rent at most for six years and the duty to pay the rent will burden the inhabitants. Therefore the community chief claimed that if the vertical houses would be for free, everyone would accept it without any protest. But his demand of free housing is utopic, because from a political point of view this cannot be implemented. Additionally, the space in the vertical housing will not be owned property and after six years residents need to move out, but they do not know where to move to (interview 14). Finally he argued that people have to move out from this area, because there is not that much space for so many people, however, houses will be in better conditions than now within the *Kampung*. He declared that with a green canopy along...
the riverside, they could foster eco-tourism in this area. The community is strictly against hotels, but they have a vision that people will come from Malioboro Street and walk around the green canopy. They want to provide a green zone for tourists with no cars and the ability to grab some food there (interview 14).

Processes from outside can be described as:

- **Natural hazards:**
  - flood and lahar flood induced by intense rain
- **Socio-economic processes:**
  - urbanisation, displacement processes, tertiarisation with economic development

### 3.6.4 From impacts to responses in RA 2

In chapter 3.6.2 and 3.6.3 on-going transformation processes, strategies and responses were described (c.f. Figure 38). In this section these circumstances will be evaluated and put in the context of the research frame. Three clustered main response strategies were evaluated, namely disaster risk reduction, environmental management and socio-economic development. As described before, distinctive differences and characteristics are within RA 2. Additionally, a separation between northern and southern parts of RA 2 and the flat and elevated areas should be made, because in this breakup most of the differences are unveiled. First, it should be mentioned that the northern part of RA 2 is not as dynamic and emergent as the southern one, because hardly any processes and related strategies could be evaluated there. Furthermore, the special and typical characteristic for the entire RA 2 is an elevation gradient between the flat areas close to Code River and the elevated parts about 50 meters east of the river.

For the northern part of RA 2 the most important change was the clearance of the bamboo and the following urbanisation process in the 1990s. Before that date, people only used to live in the elevated areas of the Kelurahan and the flat banks of Code River were used as retention areas. Furthermore, in the flat banks next to Code River a kind of a bamboo forest and other smaller vegetation was situated. It is assumed that this vegetation was used by the community as their building material and by the craftsmen for their handicrafts. Due to a fast rate of growth rate and the high population density, the pressure on the settlement area increased and almost no free space was available. As a consequence, the bamboo in the retention area and private gardens was cleared and the government built the wall embankment and rented out the land. As a result the community was willing to build their houses in the newly gained land, but because of the loss of the retention area and their direct proximity to the river, there are newly settled people more vulnerable to natural hazards than others.

Additionally, after the complete clearance of the bamboo, craftsmen within the community lost the raw material for their goods and as a result they had to shut down their businesses. The loss of the handicraft businesses could not be evaluated properly, because none of the interviewees referred to their consequent job-seeking efforts or other strategies for obtaining their living. But the loss of the handicraft business in the northern areas may be the reason as to why there is almost no socio-economic development and no benefit from customers from the Malioboro Street, like in the southern parts of RA 2.

In addition, the permanent renovation of the wall embankment helped the residents to be more protected against natural hazards. During the last lahar flood the embankment worked and the lahar was pressed through the drainage system. The water supply and sanitation infrastructures and toilets were affected but the interviewees mentioned that they only had to make it usable again, which was not a big effort, thus they mentioned that natural hazards affect them not badly. Generally, the described disaster risk reduction strategy with the agreement of the government for setting up a wall embankment was evaluated positively by
the community, because they are now better protected and have gained more land. This was the only chance for the local community to stay within the Kampung and not migrate to other Kampungs.

Figure 38: Implemented strategies inside RA 2
(own figure, 2015)
As a consequence of that they would have lost their community ties and structures, which are of high importance to them. However, during the interviews it became obvious that the community evaluates their harassments by natural hazards as hardly present and their awareness is not distinct. This explains why residents and newcomers settled in this specific natural hazards prone area in spite of the knowledge of the periodically occurring flood and laharc flood events. These specifications could be a huge problem for the community and the state due to the low level of awareness and the periodical occurrence of natural hazards events. The government and of course the community for itself should start to sensitisie the residents to the consequences of natural hazards.

Other positive developments but informal strategies for disaster risk reduction were the change of the building material from wood to concrete in the 1990s, which went along with the clearance of the bamboo and the loss of the building material. Because of that, the community is more protected against fire and the houses enable a higher living standard, but as mentioned before, due to the building density they are still vulnerable to fire. Some people built, as well, small protection walls in front of the entrance of their houses or are putting up sandbags during the rainy season to better protect their houses and furniture.

Strategies of environmental management should be seen as diverse because residents of flat areas deposit their waste into Code River and foster an ongoing pollution of their surrounding environment. In contrast, the elevated area has a waste collection system. Residents deposit their waste at an official place inside or outside the Kampung and maintain a clean environment and improve their living conditions, though it is obvious that the latter strategy is more successful. A reason for the difference in handling could be that in the older settlement people are more aware of the importance of a proper waste deposit due to the traditional community structures. Therefore, possibly a lower or different social stratum settled in the lower elevated areas and they might have other problems or not such a high level of awareness for a proper waste deposit system. One reason to assume this phenomenon could be that traditional community structures are differently distinct or developed than in the elevated areas. But it could not be evaluated as to why there are such differences between residents in the flat and elevated areas. Apart from that, no other strategy for socio-economic development beside the loss of the former craftsmen could be evaluated in the northern part of RA 2.

In the south of RA 2, but exclusively for RW 13, there are hybrid adaptions to cope with natural hazards. Because houses are built on stages and due to the concrete base of the bridge between RW 03 and RW 13, the community gets an additional protection against flood and laharc flood compared to other areas next to Code River (c.f. Figure 30). But this cannot be evaluated as a DRR strategy, because it should be seen as an additional and random benefit for the community. The conversion of the old wooden bridge to concrete was financed by the city and national government decades ago and provides the community of RW 13 with an exclusive, formal and not-so-typical protection, because a spill-over from northern parts are not able to anymore. Moreover, as a DRR strategy, the residents improved and adapted their houses informally like the residents in the northern part. They are successful in doing it because they declared as well that they arranged their living habits with the occurring natural hazards and were only hardly affected by the last laharc flood. Nevertheless, the last laharc flood destroyed a pedestrian bridge in RW 14, but interviewee 14 mentioned that they did not need it anyway. However, during the interviews it became obvious that the old community east of Code River did not completely accept the residents of the vertical housing because they migrated into this area and that brought along with it conflicts with regard to waste deposit. Thus, they approved the natural barrier and gained distance from the lower social stratum west of Code River.

Another successful formal disaster risk reduction strategy for the community is a communication network (Ulu-Ulu) with other Kampungs. However it is only used in RW 13.
Communities in the north can warn southern Kampungs about impending natural hazard by mobile phone. But it is still not completely clear why only RW 13 is using this quite simple technology and all other RWs in RA 2 are not. A hypothesis as to why only RW 13 uses this system could be that this early warning system is grounded on Kelurahan level and every Kampung can decide on its own to use it or not, but it would need further investigations to completely explain this phenomena in RA 2. Additionally, a further informal Disaster Risk Reduction strategy, which especially RW 14 is applying, is kind of a spiritual person that can adumbrate danger, and as a result warns the community if natural hazards will occur. The disadvantage of that strategy is that most of the people rely more on the spiritual person than on an official early warning system run by the government. In contrast, an official early warning system in the vertical housing in form of a siren is not properly accepted by the community because it provides no accurate information about the dangers. The aim for the future should be to gain trust for the official early warning systems by the local community, but not remove the spiritual person, because most of the people see that person as a fixed tradition for the community.

The most imposing and effective disaster risk reduction strategy is the slope-stabilising structure in RW 14. Due to the bending of the river and the following excavation of the eastern side of Code River, the government decided to implement this strategy, because these houses are likely to face more and more problems with natural hazards. Even though conflicts between the owners of those houses that had to be cleared and the government arose, overall the strategy was successful because the slope-stabilisation structure provided the best protection against natural hazards and consequently the slope is safe against landslides, which occurred in former times whilst intense rain. Nevertheless, shortly after constructing the slope-stabilisation, the community had massive problems with a non-appropriate waste deposit because the waste impacted negatively the stability of the slope-stabilising structure and it might have been possible that the construction would start to slide down to the river. But the community was able to solve this specific problem so that no further problems with the construction should occur. Prominent for RW 14 is the vertical housing at the border of RA 2. In former times this area was coined due to crime and the government might use the vertical housing as a development and upgrading strategy for the area, but interviewee 15 assured that there is no crime anymore within the Kampung. Residents who use to live in the vertical housing have mostly migrated in and are not fully accepted by the rest of the local community, although they are formally part of it. Therefore the community members suspected that their community structure would be weakened. Due to construction of the vertical housing the community lost an elementary school and a football field but they never got a substitute for their loss and none of the interviewees could say which school or public place for leisure they are using instead of the lost ones. Also the land certificate difficulties between the government and the community and the already sold land for a hotel building heat this conflict up and resulted in a hearing of the community by the government to fight against the vertical housing. They could eke out that in their area will be no further vertical housing or hotels established in the future. But it is not secured for how long the concession will last. This uncommon socio-economic strategy is an effective example for preservation of community structures. Moreover it may be accepted that the government built the imposing slope-stabilising structure knowing that the land is already sold and a hotel and further vertical housing will be set up. Or maybe the slope-stabilising structure was the requirement for selling the land. Thus, it is possible that the government used this Disaster Risk Reduction strategy in not exclusively for the local community but rather for protecting the vertical housing and for enabling the future hotel development.

Another socio-economic strategy for RW 13 is to develop and stimulate small businesses. Due to the close location to the Malioboro Street, local businesses want to profit from the vibrancy of the main shopping area. They set up guesthouses and other businesses to sell their goods to tourists and to attract new customers. Due to that development the
community gained economic wealth, based on customers from outside and not within the community. This RW is the best example for a stable economic development in the entire RA 2, although RW 14 has some similar socio-economic strategies. Interviewee 14 mentioned they want profit by selling their goods to customers from the Malioboro Street and consequently want to allure these customers more and more to RW 14. Additionally they will rent out their houses as a guesthouse. The plans are that customers can abide and consume a meal by the riverside, which would be revitalised and the walkway would be greened with a canopy. Interviewee 14 mentioned in this case eco-tourism as a strategy. But this should be examined critically, because they use eco-tourism in a quite narrow sense, targeting at greening the river exclusively. In a different context, it is unlikely that customers – in particular international ones – who have different understandings of eco or eco-tourism, want to abide and consume their meal next to a greened but still polluted and contaminated river. The implementing of the socio-economic strategy of a green canopy could only work out if all residents along the entire river will stop depositing their waste and a controlled cleaning of Code River will progress, like the strategy in the northern part, which started five years ago.

To sum up, it could be said that residents in flat areas next to the Code River rise from a lower social stratum and are more likely vulnerable against natural hazards. Their access to infrastructure is either worse than in other parts or their level of awareness is less, as they deposit their waste more into Code River. Elevated areas are more reserved for the traditional community of the Kampung. Residents of these areas also have access to the public water pipe run by the government and are more protected against natural hazards. Further, residents of the elevated areas in the southern part are more dynamic and innovative than in the northern. However, they also have had more conflicts with the government because the land does not belong to the residents and the land was already sold for building a hotel. But fighting for their community led to the result that there will be no hotels and vertical houses in their Kampung for an undefined time period, even though they have been fighting for an official land certificate for about 20 years. In contrast, residents of the northern areas expect that in some years a hotel or vertical housing will be situated in their Kampung due to ownership structures. They are only renting the land and have no voice in a matter what will happen with their settlement area. In addition, southern and elevated residents are more aware of maintaining their environment. If the intentions for cleaning Code River and stopping the waste deposit will be a successful operation for the idea of the greened canopy walkway with the intension to abide there. But for implementing this strategy, the assistance and funding of the government is needed and due to the former conflicts of the southern community with the government it is not certain if both parties can and will work together.
<table>
<thead>
<tr>
<th>Type of strategy</th>
<th>Quality of implementation</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>RW 01</td>
</tr>
<tr>
<td>Wall embankment</td>
<td>++</td>
</tr>
<tr>
<td>Slope-stabilising</td>
<td>~</td>
</tr>
<tr>
<td>Evacuation planning</td>
<td>~</td>
</tr>
<tr>
<td>Early warning system</td>
<td>~</td>
</tr>
<tr>
<td>3R principle</td>
<td>~</td>
</tr>
<tr>
<td>River cleaning</td>
<td>++</td>
</tr>
<tr>
<td>Water supply</td>
<td>+</td>
</tr>
<tr>
<td>Vertical housing</td>
<td>~</td>
</tr>
<tr>
<td>Tourism development</td>
<td>~</td>
</tr>
<tr>
<td>Funding start ups</td>
<td>~</td>
</tr>
<tr>
<td>Small business development</td>
<td>~</td>
</tr>
<tr>
<td>Business cooperation</td>
<td>~</td>
</tr>
<tr>
<td>Workshops for community</td>
<td>~</td>
</tr>
<tr>
<td>Education</td>
<td>~</td>
</tr>
</tbody>
</table>

++ good  + acceptable  -- bad  ~ no implementation

Table 3: Evaluation of strategies in RA 2
(own table, 2015)

3.7 Assessment of Research Area 3

3.7.1 Introduction
In the following chapters the results of the RW and RT interviews of the field work in Research Area three (RA 3) of Yogyakarta in reference to local transformations in the area and responses to these transformations on governmental- and community-level will be explained

Author
Susanne Kubisch
in detail. The results of the field work are based on six interviews. The interviewed persons have been the community representatives (RWs and RTs) themselves as well as their deputies. One interview was conducted with the Kelurahan.

The western part of the two RWs near Jagalan Street has a high density of unrendered houses. The density of houses is particularly high in RW 01, where one house directly borders the next one, with hardly any open spaces (c.f. Figure 39).

The RA 3, which is located south of the RA 2, is part of the Kampung Purwokinanti. In total, RA 3 has a size of 3.7 hectares. Like the other two research areas, the Kampung borders on the Code River. It consists of two RWs, RW 01 and RW 02, each of them divided into different RTs. While RW 01 consists of six RTs, RW 02 is separated into 5 RTs. The Code River forms the western border of the Kampung for both RWs. The eastern boundary of RW 01 is a highly frequented bigger street, Jagalan Street, which leads to two main streets in the direction to the city centre. RW 02 is separated by Jagalan Street, so that one part of RW 02 is located at the western side of the street and next to Code River, while the other part is situated on the eastern side of Jagalan Street, along which a lot of small businesses like butchers, Warungs and grocery stores have settled.
As a consequence, people use the small lanes between the houses to dry their clothes or to cook. RW 02 lies topographically a little higher than RW 01. There is also a high density of houses, but, on average, the houses are in a better condition because most of the houses are plastered and seem to be built of higher quality material. At the eastern part of the Jagalan Street, the density of houses is a bit less. Houses are also in a better condition and are often two stories high. Each of the two RWs houses a big medium-class hotel. The hotel in RW 01 is visible in the next picture (c.f. Figure 40):

![Hotel PUTRA SABAR in RW 01](image)

Figure 40: Hotel PUTRA SABAR in RW 01 (own figure, 2014)

Interesting in RW 02 is that there is a big brownfield on the southern border. The next chapter starts with an explanation of points of special interest followed by a description of the basic infrastructure of the RWs, which mark the area. The main part of this excerpt to RA 3 focuses on details of local transformation in the area in reference to natural hazards and socio-economic processes. Afterwards, strategies on community as well as on governmental level for these processes are explained. Also influences from outside of the RA 3 are considered. Finally, the responses from community and governmental level are described.

### 3.7.1.1 Basic infrastructure of RA 3

Corresponding to the questionnaires of the other two Research Areas, the interviews started with questions about areas of special interest and about the existing local infrastructure.

According to the interviewee 16, RW 01 could be considered to be an area of special interest, because the whole RW profits from its location near the main street and the agglomeration of small businesses along Jagalan Street. Of particular importance for the social infrastructure
is the RW 01 building, the office of the community representatives, which offers social activities like sports, traditional music and dance to strengthen the community. Also the hotel beside Jagalan Street is described by interviewee 16 as a point of reference because the hotel supports the small businesses of the RW. Interviewee 18 explained that there is an elementary school near the Kampung, but claimed the absence of a secondary school for the older children. The next secondary school is too far away to reach for the youth. Furthermore, the mosques in both RWs are addressed as points of special interest where the community can meet to pray and socialise (interview 16 and 18).

In reference to the health infrastructure, a building near the local nursery attracted the attention of the students during the field survey. After consulting a resident about the building, it was explained that the building serves as medical supply, where once a month a doctor comes to examine children and older people. Furthermore, there is a bigger medical consultancy in RW 02 where different doctors are located.

Pointing out the local infrastructure, RW 01 as well as RW 02, is connected to the municipal water supply. In addition, there are also public and private wells. Interviewee 16 claimed that in RW 01, as well as in RW 02, the water quality from the water department supply is worse than the water from the well because there are a lot of chemicals in it and therefore it does not serve as drinking water. However in RW 01, the water quality is tested by the urban health department every three months. According to the interview with respondent 17 in RW 02, 50% of the residents who live at the riverside in RW 02 use water from the public supply of the water department (interview 19), while the other 50% use the water from their own well. Even if the residents have access to the public water-supply they use their own well because of the water quality (interview 17). In compliance to the interview with the Kelurahan, the groundwater quality deteriorated over the past years. The reason behind this is the bad water quality of Code River because the residents just dispose their waste-water into Code River (interview 21). However there are septic tanks in both RWs. In RW 02, for example, the community paid for a waste-water sewer on the street (interview 20). There are also river-cleaning programmes in the upstream area, but the cleaning terminus changed – first it was once a month now it is once every four months (interview 21). In RW 02, the groundwater availability was decreased due to the demand of the neighbouring big hotel but as the hotel gave compensation to the people, they agreed to it (interview 20).

Both RWs possess toilets for public use, which are located at the riverside and are provided by the community and the government (interviews 16 und 20). Concerning the economic infrastructure, both RWs have small grocery stores and Warungs. In RW 02 there are enterprises like a chicken farm or a catering service, which produce food items for the small businesses like street vendors or kiosks in the RA 3 and also for its surroundings (interview 16). In reference to the protection against natural hazards, RW 01 and RW 02 are endowed with an evacuation road system, including road signs, evacuation places, as well as early warning systems, which are specified in the next chapter (interviews 16 and 20). In the following map (c.f. Figure 41) you can see the basic infrastructure of RA 3:
3.7.2 Transformative processes and responses in RA 3

3.7.2.1 Influences of natural hazards on the community development in RA 3

Both RWs have changed a lot within the last 40 years. Similar to the other two RAs, initially the riverbank was covered with a bamboo forest, which served as natural protection against flood (interview 16). The area has been inhabited since 1987 and the Kampung has developed constantly. Due to the large housing demand, the riverbank was deforested to provide space for the people to build their houses. Since then a lot of houses were destroyed, in particular the ones next to the river, by annual floods and lahar floods. Further, the Kampung is prone to earthquakes. A resident of RW 01 told that the most grave natural hazard for the area are earthquakes because of the destruction potential and the missing protection measures against it. They are not that afraid of floods and lahar floods due to the protection wall. The school building in RW 01 for example was destroyed by an earthquake in 2009. Afterwards it was build up again but converted to the building for the community representatives, the RW 01 building. Since the time of destruction by the earthquake, a school was not built in RW 01 (interview 16).
The whole riverside is affected by flood and lahar flood. However, RW 02 lies topographically higher than RW 01 and is subsequently comparably less affected by normal flooding than RW 01. Therefore, people from RW 01 come to RW 02 during flooding to save their own lives (interview 18). Also the comparably lower density of houses makes RW 02 less vulnerable to natural hazards. However, a big flood would affect both RWs, as the last big one in 1985 did. The flood in 1985 reached until Road Jagalan (interview 21). On the following map you can see the prone areas (c.f. Figure 42). To sum up, according to the interview with the Kelurahan, RW 01 as well as RW 02 is not only affected by flood and lahar flood, but also by earthquake.

![Figure 42: Flood prone areas in RA 3 (own figure, 2015)]

### 3.7.2.2 Strategies of local actors to cope with natural hazards in RA 3

To cope with and reduce the hazard risk, both RWs have special strategies. Both of them have an early warning system from the governmental side to monitor the water level (interview 16). The early warning system consists of three lamps and a sensor in Code River, which indicates the water level like a traffic-light system. If the lamp indicates a red sign, the people have to be evacuated. An evacuation simulation is executed by the government in both RWs every two years (interview 20). In both RWs, evacuation signs and meeting points places are
indicated to provide escape in case of hazard risk (interview 16). However the students did not find evacuation maps during the fieldwork which show how to react in case of hazard risk. In Figure 45 you can see the evacuation meeting points and routes as well as the location of the early warning systems.

In RW 01, which is different from RW 02, there is a special community called PAREANOM community, which is a bottom-up strategy to alert the residents if a hazard happens. In that case, the inhabitants are alerted through the mosque speakers (interview 16 and 18). Furthermore, there exists an alternative traditional early warning system existing on the community side of RW 01. It is a kind of neighbour watch. In case of hazard risk, the person in service who supervises the area alerts the neighbourhood with an instrument (c.f. Figure 43).

Besides education programmes and simulation trainings are conducted to strengthen the community in RW 01, this is also part of the PAREANOM community – due to the Kelurahan, RW 01 is a model area for other areas and the initiated community is yet to be formally registered by the government.
Due to the topography, the people of RW 02 are not that prone to flood- and lahar-induced natural hazards and as a result the residents do not see the need of a community strategy against such hazards like in RW 01. Consequently, there are only formal or hybrid strategies like simulation training offered by government and a hybrid early warning system run on government and community level. Hybrid, in this sense, means that the early warning strategy is elaborated and offered by government and community. Consequently, the people are also warned by an alert car and mosque loud speaker which is offered by the community and not only on governmental level (interview 17 and 18). Also, the early warning strategy in RW 02 is not that distinct like in RW 01. The RW 02 profits from RW 01, as the RWs border on each other, and is therefore as well alerted in case of hazard.

The Merapi eruption in 1990 resulted in a massive sedimentation of the Code River. The ground level of the river rose so much that the Army built a barrier to protect the people at the riverside. Afterwards, the government built a higher embankment which was restocked after the 2010 Merapi eruption (interview 19). The embankment in RW 02 was financed by the government while in RW 01 it was donated by the community and just 20% was financed by the government (interview 21). You can see the protection wall in the following picture (c.f. Figure 44).

![Wall embankment in RW 02](own figure, 2014)

Since the construction of the wall embankment the residents were not affected by floodings and lahar flood so the community is satisfied with the quality of the protection wall.
3.7.2.3 Impacts of socio-economic stressors and disruptions on community development in RA 3

The big change of the area in the last 40 years due to the urbanisation after 1987 did not only have negative aspects on the area like the destruction of the natural protection on floods of the bamboo forest, but also had positive aspects like the modernisation of the whole area, with reference to the expansion of the business activities. Since the beginning there were conflicts between the newcomers and the original inhabitants. In this context, interviewee 21 talked about an augmentation of criminality which he related to the newcomers. However, all in all, the newcomers were an enrichment for the area because they pushed business activity, settling small shops along Jagalan Street (interview 21). Consequently the development of an agglomeration of small businesses along the street was registered (interview 16).

Gradually tertiarisation processes are increasing also in RA 3. The expansion of tourism begun with the constructions of hotels in both RWs, which led to the destruction of some houses. The affected families were financially compensated and moved voluntarily to another area (interview 16 and 17). Having a look around the RWs the hotel construction process is still ongoing. As mentioned before there is a brownfield in RW 02, which was supposed for the construction of a hospital or a hotel. Most of the community members agreed to the plan to build a hospital, however, the land is still fallow land (interview 17).

3.7.2.4 Strategies of local actors to cope with socio-economic stressors and disruptions in RA 3

The strategies to deal with ongoing changes are different in both RWs. As result of the tertiarisation of the RW 01 area there is an official collaboration between the big hotel and the small businesses in the RW. The small businesses use umbrellas and advertising panels with promotion of the hotel for which they receive financial compensation from the hotel. The hotel also purchases the products of the small businesses and promotes the collaborating small businesses to their guests, so that the small business benefit from an augmentation of customers. The positive aspect for the local people is that the augmentation of business activity attracts more customers also to businesses that do not collaborate with the hotel, but the negative thing is that there is more traffic in the street because of the higher business activities. As a consequence, the number of traffic jams is increasing. Additionally, not all businesses benefit from the collaboration. The hotel in RW 02 does not have the same arrangement with the small businesses. As a consequence, the businesses there do not profit from the hotel development like in RW 01 (interview 16).

The Kelurahan also mentioned that the hotel development plays a big role for the small businesses in general because the hotels can purchase local stuff from the small businesses and the development attracts new customers. Furthermore, it provides job opportunities for the residents. He told also that the focus in the RWs lies in local creative industries like handcraft and Warungs with traditional food to become more attractive to tourists. To improve the local skills, workshops for good management and how to prepare traditional food are offered by the community to the community residents. The aim is to offer an alternative shopping street to Malioboro Street for tourists and local people. To prepare food for the small Warungs, there are also supply factories, like already mentioned before (interview 21). The applied strategies in RA 3 you can seen in Figure 45.

3.7.3 External impacts on RA 3

There are several programmes and projects from governmental side that give money to the RW to promote the community development (interview 18). For example, what was not mentioned yet is that the municipality wanted to improve and enlarge Jagalan Street five years ago due to increasing traffic but this has not happened yet. So people in RA 3 still have
to get along with the traffic (interview 18). In reference to hazard risk protection, the government supports the RWs with a monitoring early warning system for the Code River and an embankment, which was partly financed by the government. Also an evacuation simulation is run by the government every two years (interview 20) as well as evacuation route signs and meeting points in case of hazard events are provided by the government (interview 16). Due to the increasing tertiarisation, the hotel development plays a big role for the area for the collaboration between some hotels and the small businesses and the attraction of new customers. Furthermore, the hotel development brings new job opportunities to the residents (interview 16 and 21).

From non-governmental side, there are NGO projects inside the area. In the upper part of Code River there are NGO programmes to clean the river environment. However in RA 3 there is no comparable programme. Only two times a year the river was cleaned by the residents in the last years (interview 21).

Figure 45: Implemented strategies inside RA 3
(own figure, 2015)
3.7.4 From impacts to responses in RA 3

This chapter refers to the transformation processes in RA 3, which are mentioned in chapter 3.7.2 and 3.7.3 and gives an evaluation of the responses. The evaluation is on one side derived from the interviews, and on the other side from the conclusions the research group draws.

In reference to disaster risk reduction strategies, the protection against natural hazards through the embankment and the early warning system provided by the government is evaluated more or less positively, because both RWs are not that vulnerable anymore in reference to flooding. However, extreme events are not considered with the protection wall. Also the community development in RW 01 to educate the people and to conduct simulation training is seen as a positive aspect, because it strengthens the community and educates the residents how to behave in case of hazards (interview 21). Summing up the protection strategies against natural hazards from governmental as well as from community side are evaluated by the interviewees in RW 01 and RW 02 as sufficient, because in the last few years no bigger destruction happened as a consequence of natural hazards. However, in the opinion of the research group, the Paraneom community model of RW 01 should be seen as example for RW 02 to strengthen their community in reference to disaster risk. Even if RW 02 is not as vulnerable as RW 01, the community should develop a model like in RW 01 to strengthen their community in case of hazard if there happened an unexpected bigger event. In comparison to the RA 1 and RA 2, the embankment in RA 3 is much smaller and does not appear that stable like in the other two research areas and furthermore RA 3 lies topographically deeper what could lead to a big destruction in a major flood event.

Concerning the water management, according to interviewee 16 there is a need to improve of water supply and water quality. On the one side, the water provided by the public water department is interspersed with too many chemicals so that it does not serve as drinking water, and on the other side, half of the households do not own an own well, which supplies better water quality (interviews 17 and 19). Here is a lack of intervention of the municipality which should provide more public wells for the community. A further problem is the handling of the sanitation, which is mostly disposed in the river even if there are existing septic tanks (interview 21). Here the representatives of the community should educate the people about this and the consequences for the environment.

The hotel development is evaluated as a potential chance for the local people. The people who are resettled are happy with it as they get a financial compensation and a legal land certificate for their new homes (interview 18). The small businesses profit from it as some get money because of the promotion deal, while others serve as suppliers or as employees for the hotels. Furthermore, the hotels attract more tourists, who spend their money at the small businesses. According to the interview with the representative of RW 01, the negative thing is that not all small businesses profit from the hotel development and there is more traffic jams on the street (interview 16). Because the promotion strategy of RW 01 is evaluated as mostly successful there is the need to improve the relationship between small businesses and the hotel to contract the same strategy in RW 02. Later you can see the evaluation of the strategies in both RWS of RA 3 (c.f. Table 4).

In conclusion, the developments of RW 01 in comparison to RW 02 are seen as more positive because of the stronger community ties and the more community activities to respond to existing problems (interviews 16 and 21).
### Table 4: Evaluation of strategies in RA 3
(own table, 2015)

<table>
<thead>
<tr>
<th>Type of strategy</th>
<th>Quality of implementation</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>RW 01</td>
</tr>
<tr>
<td>Wall embankment</td>
<td>+</td>
</tr>
<tr>
<td>Slope-stabilising</td>
<td>~</td>
</tr>
<tr>
<td>Evacuation planning</td>
<td>++</td>
</tr>
<tr>
<td>Early warning system</td>
<td>++</td>
</tr>
<tr>
<td>3R-principle</td>
<td>~</td>
</tr>
<tr>
<td>River cleaning</td>
<td>-</td>
</tr>
<tr>
<td>Water supply</td>
<td>+</td>
</tr>
<tr>
<td>Vertical Housing</td>
<td>~</td>
</tr>
<tr>
<td>Tourism development</td>
<td>+</td>
</tr>
<tr>
<td>Funding start-ups</td>
<td>~</td>
</tr>
<tr>
<td>Small Business Development</td>
<td>++</td>
</tr>
<tr>
<td>Business Cooperation</td>
<td>++</td>
</tr>
<tr>
<td>Workshops for community</td>
<td>++</td>
</tr>
<tr>
<td>Education</td>
<td>~</td>
</tr>
</tbody>
</table>

++: good  +: acceptable  -: bad  ~: no implementation

#### 3.8 The Impact of natural hazards on small businesses

**Author**

Tim Salow

#### 3.8.1 Introduction

This chapter evaluates the outcomes of the small business questionnaires. These questionnaires were handed to people who own or work in small shops with up to eight workers in the three research areas. In the following pages we will present the questionnaire analysis and evaluation against the background of the three research questions.
3.8.2 Methodology

The standardised questionnaires have been worked out, revised and adapted in cooperation with the study colleagues of the Universitas Gadjah Mada of Yogyakarta. During field work, our goal was to get as many questionnaires filled by craft people as possible. For that goal, we split our group into three subgroups with six up to eight people per research area. It was important for us that every Austrian student had one Indonesian student with him, to get in touch with the craft persons, because they mostly could not speak English. As a result, we obtained 87 filled questionnaires, which were evaluated statistically. To do so, we had to encode all the answers uniformly. Encoding, analysis and evaluation was done with statistics programme SPSS, using descriptive data analysis, classified data sets and cross-classified tables. Furthermore, a few open-ended questions in the questionnaire were evaluated with MaxQDA. To analyse these qualitative statements, we worked out another coding, that helped us to see how often the respondents approach certain topics. In the end we have got a quantitative data analysis of the qualitative statements, which allows for a ranking.

3.8.3 Classification of local businesses

The first section of the questionnaire deals with general data on the respondents and their businesses. Out of the 87 people we asked, 71% stated they are local people, while only 29% considered themselves as newcomers. Therefore the classification of local people and newcomers was done by the people themselves, without a pre-defined year or exact classification from our side.

![Are you local people or newcomer?](image)

Figure 46: Percentage of newcomers and local people (all RAs)

(own chart, 2015)

In all three research areas this percentage was almost the same. That means we can suppose that most of the shops were already running for a longer time and that they have a particular history in their research area. The people who established these businesses may have resided there even before establishing the business. This statement is supported by the answers to the question concerning the period the respective business already exists in the particular place.
For how long does your business already exist in this place?

As you can see, over 50% of the businesses are existing for eight years or longer, while only one-fourth was established within the past three years (c.f. Figure 47). This figure looks very similar in all of the three research areas. One potential interpretation is that the research areas offer good and stable conditions for doing business. Furthermore, this result indicates that there are only few changes within the areas that occurred during the past years.

To characterise the kind of shops in the research area and the character of the research area itself, we investigated the types of businesses. In total, there is a whole variety of different businesses, amongst others, Warungs, general stores, laundries, electronic shops, hairdressers handcraft stores, caterings and bakeries. Mostly there are many Warungs and general stores, which sometimes are mixed up to one store. There are hardly any differences between the research areas with some exception: In RA 1, there are far fewer Warungs in comparison to the other areas, but many more miscellaneous shops (c.f. Figure 49).

Figure 49: Branches of trade in RA 1 RA 1 and RA 2 are very similar in their composition of small businesses, apart from the number of Warungs, while RA 3 shows few differences.
What is your business (RA1)

In RA 3 are comparably more butchers than in the other areas (c.f. Figure 50). After some enquiries in RA 3 we found out that this area was very famous for butcher shops in the past what is the cause for the persistent spatial arrangement. What we observed in all of the research areas was that the local businesses are used mostly by the local community members, without having a greater commuter area from other Kampungs.

What is your business (RA3)

Most of these businesses (84%) have only one to three workers, who often live directly in the Kampung or very near there (c.f. Figure 46 Figure 51). This is due to the fact that most of the
stores are smaller Warungs, general stores or a mix of them. Warungs are typical family owned businesses. That means they do not have or need that many workers.

**How many people work in your business?**

![Chart showing the number of employees (all RAs)](chart)

*Figure 51: Number of employees (all RAs) (own chart, 2015)*

The following figure shows the correlation between the kind of business and the workers in there. This small chart confirms the earlier statement that most of the small businesses are family owned. The majority has 1 to 3 workers in classical family-owned businesses, for example, groceries and many kinds of shops, like general stores or Warungs. But there are also some kinds that need more workers because they have, for example, also costumers outside the Kampung. The concerned benches are big catering services or some handcraft shops that are producing and/or selling the handcrafts (c.f. Figure 52).

**Correlation between kind of business and workers in business**

![Chart showing the correlation between kind of business and number of workers (all RAs)](chart)

*Figure 52: Correlation between kind of business and number of workers (all RAs) (own chart, 2015)*
After we have identified the kind, the existence and the size of the businesses, we investigated their commercial success. Interestingly, most of the respondents said their stores have only sufficient success (c.f. Figure 53), while they stated in subsequent discussions to be mostly happy with their shops and surroundings. This result let venture a guess that the commercial success is not the biggest goal for the people that run the shops or that they maybe have a little different definition of sufficient success than we have.

**How satisfied are you with your commercial success?**

![How satisfied are you with your commercial success?](image)

Figure 53: Perceived satisfaction with business success (all RAs) (own chart, 2015)

Only in RA 2 comparably more respondents evaluated their commercial success as good (c.f. Figure 54). The reason behind this is probably the location of RA 2. From the three research areas, RA 2 is the nearest to the Malioboro Street, which is very important for the tourism in Yogyakarta. That means that also RA 2 can potentially benefit from its location, due to potential income from tourists that visit the area, from employment options in Malioboro Street and the option to sell goods, e.g. souvenirs directly or to other big businesses there.

**How satisfied are you with your commercial success? (RA2)**

![How satisfied are you with your commercial success? (RA2)](image)

Figure 54: Perceived satisfaction with business success in RA 2 (own chart, 2015)
3.8.4 Results from a small business survey

Subsequently, we investigated on the impact of natural hazards on the businesses in our research area. We want to know whether the small business holders feel affected by natural hazards in general and by which ones in particular. We found out that one-third of them do not feel affected by natural hazards at all. In RA 3 even 59% denied any impact (c.f. Figure 55). One reason could be the differences in elevation and quality of the wall embankments in the different areas. Moreover, a reason for that could be the location of RA 3, the southernmost and the lowest of the three research areas. Most of the natural hazards the communities dealing with, are related to floods of Code River, which has its origin at the Merapi in the north of Yogyakarta.

![Figure 55: Perceived exposure to natural hazards (all RAs)
(own chart, 2015)](image)

But there are still small businesses which feel affected by natural hazards. In RA 1, 62% of the respondents feel impaired by volcanic eruptions. That is not astonishing, because RA 1 is the northernmost research area and it is the nearest to the Merapi, located just outside the border of the evacuation zone (a radius of 25km around Merapi). Respondents in RA 1 also felt comparably more affected by intense rain, which arises often with volcanic eruptions or monsoon in the rain period (Reithmeier, 2010). Yogyakarta is also prone to earthquakes. In RA 2 29% of the small businesses stated to be impacted, which is the highest percentage we have got in this context. The bad housing conditions could be one reason for that statement. In RA 3, one-third of the small businesses stated being affected by floods. One reason for that could be an embankment, which is either too low or too badly constructed, as you can read at the findings of the research areas.

Table 5 displays all results from the three research areas concerning the perception of risks from natural hazards (c.f. Table 5).
After we found out to what extent the small businesses feel affected by certain natural hazards, we investigated the perceived effectiveness of protective measures. It is striking that the respondents in RA 1 feel the need for more protection (c.f. Figure 56), while taking a look at Table 5 reveals that only 19% of the respondents feel affected by natural hazards at all.

**Table 5: Exposure to natural hazards in RAs 1 to 3**

<table>
<thead>
<tr>
<th>Are you affected by...</th>
<th>All areas</th>
<th>Area 1</th>
<th>Area 2</th>
<th>Area 3</th>
</tr>
</thead>
<tbody>
<tr>
<td>flood</td>
<td>26%</td>
<td>23%</td>
<td>24%</td>
<td>33%</td>
</tr>
<tr>
<td>earthquakes</td>
<td>17%</td>
<td>4%</td>
<td>29%</td>
<td>15%</td>
</tr>
<tr>
<td>volcanic eruptions</td>
<td>28%</td>
<td>62%</td>
<td>18%</td>
<td>7%</td>
</tr>
<tr>
<td>intense rain</td>
<td>6%</td>
<td>12%</td>
<td>6%</td>
<td>0%</td>
</tr>
<tr>
<td>None of them</td>
<td>37%</td>
<td>19%</td>
<td>32%</td>
<td>59%</td>
</tr>
<tr>
<td>n</td>
<td>87</td>
<td>26</td>
<td>34</td>
<td>27</td>
</tr>
</tbody>
</table>

**Are there any arrangements for protection of natural hazards in your area?**

**RA1**

- yes but it is not needed: 48%
- yes and the arrangement protect: 32%
- yes but the arrangement do not protect: 16%
- no but i would need some: 4%

**RA2**

- yes but it is not needed: 38%
- yes and the arrangement protect: 32%
- yes but the arrangement do not protect: 12%
- no but i would need some: 4%

**RA3**

- yes but it is not needed: 74%
- yes and the arrangement protect: 18%
- yes but the arrangement do not protect: 4%
- no but i would need some: 4%

**Figure 56: Necessity of protection against natural hazards (all RAs)**

(own chart, 2015)
RA 3, in contrast, is the exact opposite of RA 1. Nearly 60% of them stated not to be affected by any natural hazard (c.f. Table 5). The problem for the small businesses near the river in RA 3 is flooding. Nevertheless 74% of the respondents in RA 3 believe that they have arrangements for protection which are not even needed because there are only a few small businesses near the river (c.f. Figure 56). That could mean that the embankment in RA 3 is not even better than in the other research areas but rather that there are more small businesses near the river.

3.8.5 Potential interlinkages between economic success and vulnerability to natural hazards

In this part we want to know if there are any correlations between natural hazards and the commercial success of the small businesses in the research areas. Furthermore, we investigate on the correlation between the businesses and the ongoing socio-ecological processes the respondents are witnessing in their surroundings. That means, for example, if there is any kind of business which works better than others or if there is any correlation with the number of workers or the business lifetime? These factors can give us an insight into the socio-economic structures of the research areas.

We therefore compare the commercial success with the affectedness by every natural hazard the communities deal with according to the questionnaire. First we take a look at flood. As you can see, if the commercial success is bad, about 30% of the respondents were affected by flooding in the past years. However, also 30% of the small businesses where the commercial success is in a good state, are affected by flooding (c.f. Figure 56). It can therefore be concluded that flooding does not necessarily have a negative impact on the economic success of the businesses – or at least people don’t perceive it that way. Commercial activities in the research area, therefore, seem to be quite resilient towards flooding.

The part of the volcanic eruptions looks similar to the flooding part. In every category of commercial success, we find affectedness by volcanic eruptions, to be between 30% and 19% (c.f. Figure 57). It can be concluded that volcanic eruptions mostly do not have an impact on the commercial success of small businesses in our research areas. A slightly different image is shown by the correlation between earthquakes and the commercial success. 35% of the respondents think their commercial success is negatively affected by earthquakes. That is the highest percentage in this case. A possible explanation for that is the fact that there are only few possibilities to give an earthquake forecast (c.f. Figure 57). If we look at these results it is possible that earthquakes decrease the commercial success of small businesses in all three research areas.

The last natural hazard the communities deal with would be intense rain, but only few small businesses felt affected at all, so that we can conclude this is not considered as risk. The fourth tables give the percentage of small businesses that do not feel not affected by any natural hazard. It is particularly interesting for two reasons. On the one hand, you can see that about 65% of the businesses with excellent commercial success don’t feel affected by any kind of natural hazards. But on the other hand, businesses with bad and with good commercial success have nearly the same percentage of affectedness (c.f. Figure 57). In conclusion, there is no explicit correlation between the commercial success and the affectedness to natural hazards. All in all it is astonishing that despite the high level of risk from natural hazards, the consternations are comparatively low. Furthermore, there are no big differences between the effects on the commercial success between the different natural hazards.
Correlation between commercial success and...  

Figure 57: Correlation between commercial success and different natural hazards (all RAs) (own chart, 2015)  

Finally, we investigate the correlation between the commercial success and the arrangement for protection from natural hazards. At first sight you can think about a correlation between these two factors, because many of the respondents say, that they have such arrangements for protection. But the questionnaire results reveal that only a small group of them really feels the need for them for their commercial success. Most of them state having
arrangements for protection without needing them. That factor the statement that the commercial success and the perceived affectedness by natural hazards do not correlate in a broader sense.

Next we deal with the businesses and selected socio-economic processes. At first we want to find out if there is any correlation between the commercial success and the runtime of the business. Over 60% of the businesses with excellent commercial success have existed for more than 8 years already. Also, about 50% of the businesses with bad commercial success have run running for less than 3 years. We can conclude that the commercial success correlates with the lifetime of the business, which is not too surprising, as non-successful businesses probably are given up after a while.

Subsequently, we investigated the correlation between the kind of business and for how long they are running. In fact, there are many kinds of small businesses like handcraft stores, shops (for example general stores and textile shops) which exist for more than 8 years. On the other hand there are some kinds of small businesses, which are of much younger age, like some services (for example laundries, hairdresser, repair shops). This could correlate with some tertiarisation processes in and around the research area, for example, the building of some hotels in or near the area. In some cases the small businesses cooperate with the hotels, for example, in RA3 to attract more customers. In other kinds of small businesses, it does not seem to matter how long they have already existed in correlation to their commercial success, for example, the groceries have mixed results (c.f. Figure 60). All in all, there is a
strong mixed statement in the correlation to the commercial success between long existing businesses, very young existing businesses and businesses where it does not matter how long they exist behind the figure.

In summary you can see, that the socio-economic processes have an impact on the small businesses, especially on the kind of business and on their commercial success. But there are also some factors, which are less affected by tertiarisation processes, like the number of workers in the businesses. All in all, you can see influences of tertiarisation processes but they are at the beginning.

### 3.8.6 Conclusions

All in all we can draw different conclusions from the questionnaire results. At first, we can see that the most of the respondents are locals and have lived in the communities for a long time and probably know each other. More than a half of the respondents state not being affected by natural hazards. There is no clear correlation between commercial success and the affectedness by natural hazards. On the one hand, you can clearly see that the respondents often have commercial success, despite being affected by natural hazards. On the other hand there are of course negative impacts on some small businesses. In summary, the commercial success of the small businesses prevail over the natural hazards, whereby the question of the influence of natural hazards on the community development in the research areas still needs to be answered.

Moreover, the data analysis of the questionnaire results provides us an insight into the socio-economic structure in and around the research areas. All in all, we found out that there was a change in the kind of businesses that emerged in particular throughout the last three years. New branches of trade were established in succession with a beginning tertarisation processes in the area’s surroundings. But the new shops are mostly not (yet) as successful as the old ones, which are in the Kampungs for eight years or more, which shows us how economical processes influencing the research areas.
3.9 Conclusions and recommendations

3.9.1 Relevant effects of natural hazards and socio-economic development processes along Code River transect

3.9.1.1 Effects induced by natural hazards

Along the Code River transect, generally all three research areas are potentially affected by natural hazards. In particular, these are flood, lahar flood and landslide caused by intense rain as well as earthquake caused by Mount Merapi, which is located northern of Yogyakarta City. Within the transect areas that are most prone to natural hazards, those that are immediately vulnerable are situated in the flat areas along the riverbank. According to the interviewees, flood and lahar flood are the most perceived hazards in each RA. However, along Code River transect, the residents barely feel affected by natural hazards due to a recurrence of the hazardous events and lack of alternatives, but they are still aware that flood and lahar flood are a hazard which is influencing on their community life.

An additional, potentially hazardous process is intense rainfall during rainy season. This process as well is not perceived as a hazard by the residents but is provoked as an example for most of the residents as damages in community infrastructure and building fabric of private households. In addition intense rain causes landslides at exposed and elevated slopes, putting the local buildings at risk. The appearance of landslide is possible for RA 1 and RA 2, because these areas are built on an elevated slope with a steep gradient down to Code River. However in the southern parts of RA 2 landslides cannot occur anymore due to the slope-stabilising structure. The same statement is valid for RA 3 which is situated lower down compared to RA 1 and RA 2. Additionally all communities along the Code River transect are prone to earthquake, thus this is only little-noticed by the community and their residents.

So far these processes have been described for each RA along the Code River transect individually. For gaining a broader view and to derive the big picture, detected local processes which are influencing the local communities of each RA have to be embedded in a holistic urban context, since those factors also influence on the city-level, and not exclusively on local communities. Consequently causes of flood and lahar flood on the city-level are:

- The insufficient sewer system, which cannot cope with the volume of water
- Buildings and infrastructure get damage by the standing water
- The mass of waste, especially plastic waste, congests the drains and the following pollution of ground water
- The sediment congests the wastewater disposal, the water supply and wells
- The sediment accumulates on housing areas and clogs the sanitation system

3.9.1.2 Effects induced by urbanisation and tertiarisation

Current socio-economic development processes influence the research areas, in particular urbanisation and tertiarisation. Urbanisation is induced by a rapid population growth with
increasing housing demand and a rising number of immigrants from rural areas into Yogyakarta agglomeration. One main trigger of this rapid development is the fast economic growth of Indonesia. As a consequence Yogyakarta City is also fostering economic and small business development, including hotel planning and tourism development. Due to urbanisation processes, the areas along Code River transect have changed immensely in the last 30 years. As a result, new settlements were built along the riverside in an informal way. This area is flood-prone and served as flood mitigation area, and as a consequence the natural buffer zones in all three RAs vanished while the number of households at risk grew. Migration and population growth have led to a higher density of houses inside the communities. As a result they are more vulnerable against fire which spreads easily from one house to another. This specific phenomenon cannot be listed as a natural hazard, but is rather man-made. As mentioned before, tertiarisation processes of Yogyakarta agglomeration concern local residents in different ways and are equally influential on the development inside and outside of all RAs. Both described socio-economic processes (urbanisation and tertiarisation) might trigger gentrification in RA 1. Coherent processes were evaluated for RA 2, but in contrast vertical housing at the southern border was set-up by the government. Their main target was to work against the increasing housing demand, but living in these houses is still not accepted by the residents. This formal intervention by the government is the only perceivable kind of process along Code River transect. Another process identified along the entire transect is the starting of small business enterprises. However, it is not homogenously continuous but rather a cluster development dependent on nearby economic hotspots. Moreover, by evaluating the affectedness of small business enterprises, a correlation between commercial success and natural hazards can be figured out and listed as:

- The respondents often have commercial success, despite being affected by natural hazards.
- There are of course negative influences on some small business by natural hazards.

These factors will lead to independence of commercial success, in spite of natural hazards. Additionally, a change in the emerged business throughout the last three years was investigated while new branches of trade could be easier implemented at the beginning tertiarisation process. New branches and shops are mostly not (yet) as successful as the old ones that have been in the Kampungs for eight or more years.

In addition to the described urbanisation and tertiarisation processes for each RA, are current on-going main processes for the entire Yogyakarta agglomeration. Thus, tourism and hotel development in an urban context offer the following chances and risks for the research areas:

- Hotels increase the pressure on the building areas. An interviewee sees that as a task of the government to limit the number of the hotels.
- Hotels also provide new potentials: surrounding communities can be involved in the hotel business as employees for laundry or other services.
- Potential benefits for the nearby communities, for their residents and for hotels.

3.9.2 Evaluation of coping strategies along Code River transect

3.9.2.1 Coping strategies for natural hazards

After evaluating how affected all RAs communities are, strategies to cope with natural hazards and socio-economic development have to be differentiated according to quality of implementation. Apart from that, measures against natural hazards can be clustered and listed into:
- **Structural strategies:**
  wall embankment, slope-stabilising structure, gabions, sandbags and temporary protection
- **Evacuation planning:**
  evacuation maps and signed evacuation routes
- **Early warning systems:**
  monitoring water level, formal communication network between communities, informal spiritual person, siren on vertical housing, workshops and simulated trainings of disaster events

All of these measures are components of disaster risk reduction (DRR) but it is not evident if the responses are unique to each RA or underlie the overall planning. The structural responses cope with flood and lahar flood while early warning systems and evacuation planning deal with all natural hazards that might appear. Along the Code River transect a permanent wall embankment was built, financed by the government. All communities heightened it by themselves, and in case of an appearing flood or lahar flood, they additionally combined it with sandbags on top and in front of the houses to improve and protect their households. According to that RW 05 in RA 1 has to be seen as an example of “bad-practice”, because the wall embankment is not high enough. It will, however, not be heightened, and instead used for protection gabions of minor quality and implementation, but they do not achieve the required action (c.f. chapter 3.5).

The northern part of RA 2 is as well an example of an informal and temporary DRR strategy. They set up temporary protection walls combined with sandbags in front of their houses to protect the households in case of a flood or lahar flood. The southern part of RA 2 has an untypical protection against natural hazards compared to all other communities. Due to the concrete base of the bridge between RW 03 and RW 13 in RA 2 RW 13 has a stable protection against spill-overs of flood and lahar flood from RW 03 and the riverbank due to a bending of Code River. RW 14 in RA 2 has the most obvious protection against natural hazards in form of a slope-stabilising structure. The government financed it, and the army in combination with the local community set it up. RA 3 seems to be less vulnerable against natural hazards, however for unexpected big events the embankment seems to be too small and instable. This is caused by a topographically low-lying location of the RA 3 compared to RA 1 and RA 2.

Besides that, RA 1 and RA 3 comprise of a relatively sophisticated evacuation planning with evacuation maps and evacuation routes. The evacuation map of RW 06 in RA 1 is a best practise, because their maps feature all possible hazards and easily understood evacuation routes are of a good quality. There are unfortunately gaps in the implementation and quality of the evacuation planning within the communities. RA 2 does not even exhibit any evacuation planning and it could not be investigated why there is such a lack of preparedness.

Early warning systems are implemented in formal and informal ways in all communities. Formal early warning systems are the *Ulu-Ulu* communication network and a siren installed in the vertical housing. Before the installation of the formal early warning systems, the informal early warnings were the official ones and accepted by the residents. Nevertheless informal early warnings are namely alerts from mosque loudspeakers, community neighbour watch, traditional instruments and the faith of a spiritual person, which could be a positive supplement to the government early warning strategy. Nevertheless the mentioned early warning systems are used arbitrarily by the communities and some believe in more traditional early warning systems than in a formal one. Unfortunately it cannot be said sure whether the strategies are working or not. In addition, qualitative differences have to be considered. It is particularly interesting that the early warning systems were only mentioned as a strategy against flood and are not used in different contexts like for earthquake and fire
events. This might be caused by the relatively high perception of flood and lahar flood compared with the other types of natural hazards. To sum up, communities evaluated the implemented DRR strategies as positive and useful. Regardless there are huge differences in terms of protection type, in the implementation and the approach of the local community. For a broader and municipal point of view, it should be said that in terms of spatial planning, a 50m buffer zone from the riverbank for flood prone areas is predetermined, but unfortunately these areas are built up with illegal settlements. In case of a disaster, early warning systems as well as evacuation plans are useful and most of the communities developed some individual plans, but it was not obvious during the interviews if they are implemented in the local community or not. Additionally, for urban development and a uniform overall urban planning, the development plan meeting exists for local communities. In the course of the meeting, they evaluate for each community different programmes which will be subsequently implemented area-wide along Code River. The target idea of the local government is to develop a resilient Kampung, which is an official programme for Yogyakarta City. The main goal of developing a resilient Kampung is to set-up preparedness of local communities in case of an emergency situation. In addition, RW 06 in RA 1 is a best-practice example for a resilient Kampung, because they hold the best evacuating and early warning mappings. An additional strategy is to relocate people who live near the river, which only happened in RA 3 according to the interviews. The results of the evaluation of this strategy are diverse, because of the potential for conflicts and misunderstandings of the local community within the government occur.

3.9.2.2 Coping strategies for socio-economic stressors and disruptions
Socio-economic development can be classified into:

- **External strategies:**
  funding of start-ups, vertical housing and hotel planning as well as tourism development by the government
- **Internal strategies:**
  tourism development and launching small business by the community
- **Hybrid strategies:**
  cooperation between hotels and small businesses, workshops for community members, environmental management and greening

These circumstances are evaluated with regard to the research frame. All named strategies are cluster into two main response strategies, namely socio-economic development and environmental management.

In all RAs, small business enterprises were and still are set-up. This is mostly going along with hotel and tourism planning and can be seen as a socio-economic strategy for gaining more wealth. Especially in RA 1 the funding of start-ups by local authorities is a positive aspect for the community development. It has already been implemented and comprises business cooperation. As mentioned before, hotel planning and tourism development is a process that is taking place in Yogyakarta agglomeration, however there are differences in the implementation between the different communities. Besides that, in RA 1 fewer processes are taking place compared with other communities though RW 06 is the only community in RA 1 where hotel planning are taking place at the moment. However there is the chance that it might start in RW 04 as well in the future. Generally hotel and tourism planning has to be seen critically, because these strategies are still not working properly and induce different
aspects which are affecting the local environment. However, it is a problem for most of the communities in the Yogyakarta agglomeration.

The number of small businesses in RA 2 is highest in its southern parts, because they want to profit from the vibrancy of Malioboro Street. Here, in contrast to RA 1, is no funding of start-ups, but residents of southern areas are longing for that as well as for business trainings organised by local authorities. In the northern parts of RA 2 no small business development could be detected. In former times handicraft businesses were located there but they are already shut down probably due to the lack of raw material and there are no plans to revitalise them. At the moment, hotel and vertical housing planning as well as tourism development is a process that is only taking place in the southern parts in RW 13 and 14 of RA 2, but there is no business cooperation like in RA 3. Special for RW 13 and 14 in RA 2 is that land is already sold for future hotel planning and additional vertical housing. Thus it could be assumed that the slope-stabilising structure was not built for the local community itself in the first place, but for future planning. In that case, the local community fought for their rights and achieved that the hotel planning has not been implemented so far and that no more vertical housing will be set up. But no one knows how long this mutual consent will last. Nevertheless in RA 2 only RW 13 and 14 try to foster tourism. They want to implement a green canopy walk next to the river in a community-based approach. The aim is to attract people from Malioboro Street to abide there. This strategy needs the implementation of environmental management programmes, which is still not working well in the RA 2, like, unfortunately, in almost all other communities. Elevated areas have such programmes; non elevated areas still pollute Code River, also due to a lack of environmental awareness. But the entire Code River transect is dependent on such movements along the river. International tourists may not want to spend their time next to a polluted and in some ways contaminated river, therefore tourism development strategies will require the upgrading of the river environment. In the future probably all mentioned socio-economic strategies will be implemented as well in the northern parts due to the land status. Local residents are only renting the land and have no voice in any matter. The set-up of vertical housing or hotels will be a probable process for this site, because they are farther from Malioboro and feature a quiet site compared to the southern parts of RA 2. Beyond that it is assumed that due to the densification of Yogyakarta City it might be possible that in some years vertical housing is the only probable way for the government to handle the lack of building land and will be accepted by the residents due to quality of construction and life.

In RA 3 families were resettled due to the hotel construction but they are comparably more satisfied, because they got financial compensation for the resettlement and a legal land certificate – which they often did not possess before. Additionally most of the small businesses collaborate with hotels. They promote the hotel and at the same time the hotel promotes their businesses. Additionally, the small businesses get financial compensation. Furthermore, the hotel development attracts new customers for the small business in the area and offers new job opportunities for the local residents. The negative aspect of the hotel development is that not all small businesses profit from the development and the increasing traffic in Jagalan Street. Compared with the other two RAs, RA 3 has more problems with its environmental management. One aspect is that the residents are not accepting the water of the water department, because it serves not drinking-quality water and evidently more chemicals. Additionally RA 3 uses for the waste water disposal septic tanks, but residents still dispose their solid waste and waste water into Code Rive like most of the residents in the other RAs.

To sum up, all communities evaluated their own socio-economic strategies as positive and useful but not everyone is profiting from hotel development and tourism. Regardless there are huge differences within the communities by implementing socio-economic strategies, and also negative effects could be investigated. Most of the on-going development processes within the communities are also spread within Yogyakarta agglomeration. Urbanisation is a
result of many immigrants and the increasing tertiarisation followed by the rapid economic and tourism development. Tourism is actually the main economic development factor for Yogyakarta. The hotel development has the following consequences for the research areas:

- The hotels increase the pressure on the building areas. An interviewee sees that as a task of the government to limit the number of the hotels.
- The hotels also provide new potentials: the surrounding community can be involved in the hotel business, as employees for doing laundry or other services
- potential benefits (e.g. increase of income, independence, start-ups) for the nearby communities and their inhabitants and also for the hotels

Therefore the main challenge is how to balance economic and social development in a spatial manner. Urban development is formally regulated by a spatial plan. The local government informs the local communities about these strategies. But also the local communities have the right to present some projects and to consult the local government. Within the RAs there are many different strategies for dealing with socio-economic processes. Some deal with the improvement of social aspects of the community, while others foster business activities. To gain an overview of all strategies and all involved actors along Code River transect, a development plan meeting was set up. This is an instrument for communication, where everyone can put remarks or inputs.

3.9.3 Resilience Check

Folke et al. (2010) mentions that a community can reach three kinds of abilities to respond against impacts. The reachable abilities may be seen as steps up to full urban resilience, but every single ability offers protection against harmful and hazardous processes from the outside. Processes, natural- and man-made hazards, as well as socio-economic processes can occur both in short- and in long-term periods impacting the communities. The following described abilities were figured out by Folke et al. (2010) but are defined and adapted in their understanding during the research project.

To deal with detected pressures, communities can acquire the ability to resist. Resistance addresses the symptoms of processes impacting the community, but is not solving the real cause. A good example is the usage of sandbags in the case of a flood. It is a short-term measure to deal with an upcoming pressure. Because of the structural measure they can respond to disaster events. However, if disasters reach bigger dimensions or appear suddenly without lead time communities lose their protection and ability to response. To be safer to shocks, communities can implement strategies that aim towards adaption.

Adaptation is the next step after having the ability to resist. It includes measures that deal for longer periods with hazardous processes impacting the communities. Taking the example of the wall embankment and the ability to resist by using sandbags to heighten the wall, the permanent heightening with concrete would be the adaption. Nevertheless, strategies to adapt still focus on the handling of symptoms. If a community has the knowledge to implement strategies solving the driver that pressures on them they have reached the most sustainable type of resilience: the ability to transform.

Transformation includes the knowledge for reasons and trigger points of processes that affect communities in their housing area. However, the ability to transform is defined as a ‘two - way - knowledge’. At first the ability aims to reduce or even eliminates the driver, which means, in the example of a wall embankment, to be safe against flood. This would not be an adequate strategy of an ability to transform. For that, the strategies must aim at the reason for the flood itself, and if this is not possible a resettlement in an area not prone to flood could be a second way of transformation. So the state of transformation is surely the
most sustainable one and a goal every community should try to achieve. However, this is often difficult to attain for communities in Yogyakarta.

To monitor the state of resilience for every Research Area the strategies were evaluated according to the three abilities announced by Folke et al. (2010).

Table 6 states the assumption that the communities of all research areas have difficulties with the implementation of strategies fostering a transformation process. Especially strong harmful impacts of disaster events rely on resisting strategies like wall embankment, sandbags and gabions. All strategies referring to DRR have a strong positive impact on the ability to resist, even impacting the communities to the point of adaptive knowledge. Nevertheless, all RAs creating urban resilience to cope with hazardous processes will not be able to implement strategies impacting the ability to transform in a positive way. Referring to the environmental management solid working strategies are implemented fostering all abilities to transform including RA1 and RA2, but somehow not inside of RA3. RA1 and RA2 implemented with the ‘3R-Principle’ a strategy that is aiming at the transformation of the communities to waste reduced areas.

Indeed problematic are strategies for urban- and tourism development. They are impacting the abilities to resist, adapt and transform even in a negative way. This is traced back to the implementation background. Strategies for urban- and tourism development are mostly developed on a higher administrative level for touristic potential inner-city parts of Yogyakarta City and are aiming not necessarily at the local communities. Often those strategies are impacting the communities by accident, and thus, the strategies are impacting the abilities for creating urban resilience even in a negative way. One reason for that might be that socio-economic processes are hard to conceive and strategies are often quite complex. This is confirmed regarding the small business development, and as a consequence, strategies are impacting the abilities to resist and to adapt in a positive way for all RAs. Small businesses are mostly community-based and ensure social and economic development from the inside.

To sum up, all RAs have the potential to create urban resilience. However, they have not created any sustainable urban resilience yet. Therefore each RA should have implement strategies impacting at least the ability to resist in a continuous way.

Table 6 shows obvious that all RAs have the potential to create urban resilience. To cope with disasters, the investigated communities have the acquired knowledge to resist. In the case of environmental management, RA1 and RA2 even created urban resilience by implementing strategies that foster adaption of community behaviour. Nevertheless, all RAs are still vulnerable to socio-economic processes from the outside.

<table>
<thead>
<tr>
<th>Strategy</th>
<th>Research Area No.</th>
<th>Ability to resist</th>
<th>To adapt</th>
<th>To transform</th>
</tr>
</thead>
<tbody>
<tr>
<td>DRR</td>
<td>1</td>
<td>++</td>
<td>+</td>
<td>~</td>
</tr>
<tr>
<td></td>
<td>2</td>
<td>++</td>
<td>+</td>
<td>~</td>
</tr>
<tr>
<td></td>
<td>3</td>
<td>+</td>
<td>+</td>
<td>~</td>
</tr>
<tr>
<td>Environmental Management</td>
<td>1</td>
<td>+</td>
<td>+</td>
<td>+</td>
</tr>
<tr>
<td></td>
<td>2</td>
<td>+</td>
<td>+</td>
<td>+</td>
</tr>
<tr>
<td></td>
<td>3</td>
<td>~</td>
<td>~</td>
<td>~</td>
</tr>
</tbody>
</table>
### Table 6: Resilience check for RAs 1 to 3
(own table, 2015, according to Folke et al., 2010)

<table>
<thead>
<tr>
<th>Urban Development</th>
<th>1</th>
<th>~</th>
<th>-</th>
<th>-</th>
</tr>
</thead>
<tbody>
<tr>
<td>2</td>
<td>+</td>
<td>~</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>3</td>
<td>~</td>
<td>~</td>
<td>~</td>
<td>~</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Tourism Development</th>
<th>1</th>
<th>~</th>
<th>-</th>
<th>-</th>
</tr>
</thead>
<tbody>
<tr>
<td>2</td>
<td>+</td>
<td>~</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>3</td>
<td>+</td>
<td>+</td>
<td>~</td>
<td>~</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Small Business Development</th>
<th>1</th>
<th>+</th>
<th>+</th>
<th>~</th>
</tr>
</thead>
<tbody>
<tr>
<td>2</td>
<td>+</td>
<td>+</td>
<td>~</td>
<td>~</td>
</tr>
<tr>
<td>3</td>
<td>+</td>
<td>+</td>
<td>~</td>
<td>~</td>
</tr>
</tbody>
</table>

**++ strong positive impact; + acceptable impact; – negative impact; ~ no impact**

### 3.9.4 Recommendations

In the previous part the evaluation of impacts of natural hazards and socio-economic processes of the three research areas and the surrounding areas was addressed. Further strategies of the communities to handle these processes and impacts were assessed and compared (cf. chapter 3.9.3). However as revealed in the preliminary chapter, the strategies applied by the investigated areas differ, and also within the RAs there were observed differences in terms of the handling of these processes. Hence the executed strategies of the RAs were evaluated diverse in the Resilience Check (cf. chapter 3.9.3) in reference to profitableness and success.

Therefore recommendations are given how the communities can improve the already existing strategies, adapt successful strategies of neighbouring areas or apply new strategies to handle natural hazards and impacts of socio-economic processes. The given recommendations serve to strengthen the internal capabilities of the communities and foster resilience in a continuously changing urban context. The recommendations are derived from the findings of the field research and give an answer to the research question what recommendations could be given to foster adaptive governance towards urban resilience in each of the three RAs. The recommendations have a primarily application-oriented focus.

#### 3.9.4.1 Recommendations to foster resilience against natural hazards

Recommendations to foster resilience in coping with natural hazards are aimed on strategies that are already implemented but have to be improved within the *Kampungs* as well as on the implementation of new strategies on the community level. Regarding the structural protection, the wall embankment is mainly adapted to annual flood. The reason for this is that the community does not want to lose the accessibility to the river as functional space. Hence a compromise between protection and accessibility to the river has to be made. Partly communities have deficits in reference to the protection of periodical events, in the form of leakages in the wall embankment. With regard to this, it is recommended that the physical
conditions of the wall embankment be checked by the *Ulu-Ulu* annually along the riverside in all urban areas, and in case of visible deficits, inform higher administration levels. In an ongoing process, the deficits are acquiesced by experts of the higher administration. In the form of participatory workshops within the communities, experts of the city government have to communicate technical know-how to the participants on how to monitor and adapt in case deficits the wall embankment. If there is a lack of financial resources on the part of the community, and the city government should financially support the communities.

On the basis of a quid pro quo principal the community obligates itself to execute a monthly river cleaning programme and therefore receives financial support to improve the structural protection. There are already partly existing river cleaning programmes by the *Ulu-Ulu*, or student work within the communities, however the financial support could urge the communities to adapt the river-cleaning programmes in all areas and to consequently execute it. Another possibility to improve this measure could be an exchange of information and experiences within the RAs to profit from the technical knowledge of each other. This is part of local authorities who have to further this information exchange. Protection strategies differ as well in reference to evacuation planning between and within the RAs. Here, RA 3 has an exemplary strategy which is called *Paraneom community*. It is a kind of community meeting point which offers simulation trainings and educational training on how to behave in case of hazard. Furthermore, the awareness of the community members regarding natural hazards is advanced in the form of information exchange between experts and community members. This should be in the interest of local authorities to foster information exchange concerning evacuation planning between the RAs. The city government should serve as mediator to prompt this exchange.

The lack of awareness of the impact of natural hazards on the part of some community members represents the basic problem, because if there does not exist awareness there is no willingness to adapt structural measures or to exchange or to receive knowledge about evacuation planning. This could be a part of community internal workshops like exemplary the *Paraneom community* organised by local authorities and supervised by the city government. To achieve a resilient handling of natural hazards, the building of awareness and the exchange of best practice examples and experiences within and between the RAs has to be of interest to local authorities to advance this communication process. The city government should merely serve as mediator for the convergence between the communities. Furthermore, the community internal use of resources and opportunities should be used to strengthen. Besides this, the information exchange between and within the communities should be prompted. In addition, the integration and the support of the city government concerning financial and knowledge support should be facilitated. The aim is to achieve a resilient development of the communities in reference to the handling of natural hazards.

### 3.9.4.2 Recommendation for strategies to cope with socio-economic stressors and disruptions

Due to their periodical exposure, each of the communities found their own way to handle the impacts of natural hazards. However socio-economic are not very tangible for the communities and therefore each community has different conceptions and strategies to approach this processes.

In the following the implementation of strategies and the improvement of already existing strategies to treat socio-economic processes like tertiarisation, urbanisation and measures to improve environmental management are recommended. Like in reference to the protection strategies against natural hazards, strategies to handle socio-economic development differ between and within the RAs for reason of different endowment of knowledge and resources. The aim of the recommendation is to foster information exchange between the communities, collaboration between the city government and the communities.
and to improve already executed strategies to achieve a resilient development in the RAs. External strategies, like hotel development, occur in all of the three RAs, however the community internal level of integration and participation at this external process differs. Hotel development can partly be seen as a positive process because it stimulates the development of the area due to increasing financial investments in the area, and indirect revenues for restaurants and shops. However possibly concentration of indirect revenues on hotel internal restaurants or bigger shops and the relocation of people to other areas due to hotel construction and negative consequence for the environment are, amongst others, negative aspects of this development.

Here the city government has to integrate the communities in the decision-making process. In the form of meetings between the city government, experts of environmental management and tourism development as well as local authorities of the communities, the hotel planning has to be checked for compatibility with the environmental conditions in the area and for its possible consequences for the area. Furthermore, the hotel development has to be linked to commitments, which foster the development of the whole area. For example, the built hotels have to obligate themselves to obtain products from the small business in the area or financially support environmental management in the area. Another best practice example is the collaboration between a hotel and the small business in RA 3, which are financially supported by the hotel promoting the hotel on umbrellas in front of the shop. The relocation of the people is already partly linked with a legal land certificate for the resettled families and financial support, which should be carried on like this.

Another development which occurs partly in the areas is vertical housing. Due to the increasing population in Yogyakarta and the resulting density of houses in the RAs as well as flooding, vertical housing could be a solution. However not all communities agree with this development, which could be seen in the southern part of RA 2. For this reason, the city government in consultation with local authorities of the RAs, should consider this option critically and prove in workshop with experts of different sectors, like environmental management and construction of the city government in participation with local authorities and members of the communities, if this is an appropriate solution for their area. If they prove it as appropriate, the community members have to be convinced of the advantages. A possibility is that the housing design is tailored to the community needs as far as possible, e.g. by including space for small businesses on the ground floor. Furthermore, the people who have to be settled because of the construction should have the possibility to live in the new building or get a legal land certificate for their new place.

Environmental management in all three RAs is still weak and lacks improvement particularly regarding waste-water disposal and waste disposal, which is partly thrown into Code River. On part of the city government in association with local authorities, there has to be improved sewage system and development of a kind of garbage damp to give the community members the possibility to dispose the wastewater and the waste somewhere else other than into the river. Furthermore, the communities have to strengthen the awareness of the community members concerning environmental management. In the form of a community like the already mentioned Paraneom community, the awareness could be strengthen, in the form of community workshops with lectures of local environmental experts or NGOs. Furthermore, the community members could elaborate on other possibilities to dispose the waste, in the form of workshops. In addition, it should be the task of the community association to supervise the river cleaning process. People can get incentives, like food marks etc., to dispose the wastewater and the waste in the provided bins.

Summing up, a more resilient community development requires both strategies for disaster response and preparedness and strategies to benefit from socio-economic processes on an urban scale. To create urban resilience, a substantial improvement of the communication considering information exchange of best practice examples and knowledge between all
communities and community members is of utmost importance. Periodical meetings within and between the communities are a possibility to exchange information and to elaborate joint strategies. Furthermore a better collaboration and support on the part of the city government with the communities has to be elaborated on.


3.10 Bibliography


### 3.11 List of interviews

<table>
<thead>
<tr>
<th>Research Area</th>
<th>Interview Number</th>
<th>Organisation</th>
<th>Date</th>
</tr>
</thead>
<tbody>
<tr>
<td>Urban level/academia</td>
<td>1</td>
<td>Dr. Dyah R. Hizbaron (UGM)</td>
<td>24.09.2014</td>
</tr>
<tr>
<td></td>
<td>2</td>
<td>Prof. Dr. Junun Sartohadi (UGM)</td>
<td>24.09.2014</td>
</tr>
<tr>
<td></td>
<td>3</td>
<td>Dr. Djati Mardiatno (UGM)</td>
<td>24.09.2014</td>
</tr>
<tr>
<td>RA 1</td>
<td>4</td>
<td>Head of Kelurahan Terban</td>
<td>23.09.2014</td>
</tr>
<tr>
<td></td>
<td>5</td>
<td>RW 4 RT 19,</td>
<td>20.09.2014</td>
</tr>
<tr>
<td></td>
<td>6</td>
<td>Head of RW 5 and RW 5 RT</td>
<td>19.09.2014</td>
</tr>
<tr>
<td></td>
<td>7</td>
<td>RW 6 RT 29</td>
<td>22.09.2014</td>
</tr>
<tr>
<td>RA 2</td>
<td>8</td>
<td>RW 1 RT 2</td>
<td>19.09.2014</td>
</tr>
<tr>
<td></td>
<td>9</td>
<td>Head of RW 2</td>
<td>19.09.2014</td>
</tr>
<tr>
<td></td>
<td>10</td>
<td>RW 2 RT 9</td>
<td>19.09.2014</td>
</tr>
<tr>
<td></td>
<td>11</td>
<td>RW 3 RT 13</td>
<td>20.09.2014</td>
</tr>
<tr>
<td></td>
<td>12</td>
<td>RW 13 RT 53</td>
<td>22.09.2014</td>
</tr>
<tr>
<td></td>
<td>13</td>
<td>Head of RW 13</td>
<td>23.09.2014</td>
</tr>
<tr>
<td></td>
<td>14</td>
<td>RW 14 DRM</td>
<td>20.09.2014</td>
</tr>
<tr>
<td></td>
<td>15</td>
<td>Head of RW 14</td>
<td>20.09.2014</td>
</tr>
<tr>
<td>RA 3</td>
<td>16</td>
<td>Head of RW 1</td>
<td>20.09.2014</td>
</tr>
<tr>
<td></td>
<td>17</td>
<td>Head of RW 2</td>
<td>19.09.2014</td>
</tr>
<tr>
<td></td>
<td>18</td>
<td>RW 2 RT 7</td>
<td>20.09.2014</td>
</tr>
<tr>
<td></td>
<td>19</td>
<td>RW 2 RT 9</td>
<td>20.09.2014</td>
</tr>
<tr>
<td></td>
<td>20</td>
<td>RW 2 RT 5</td>
<td>23.09.2014</td>
</tr>
<tr>
<td></td>
<td>21</td>
<td>Head of Kelurahan Purwokinanti</td>
<td>22.09.2014</td>
</tr>
</tbody>
</table>

Table 7: Interviews conducted in Yogykarta
(own table, 2015)
4. Evaluating the impacts of hazard-driven relocations on local livelihoods in Surakarta

4.1 Introduction to Surakarta

While some basic information about Surakarta is already given in chapter 2.8.2, the following pages intend to give an introduction to urban dynamics in the city and the "EvalAdapt" project. The research in Surakarta, which is also known as Solo, was conducted between Sept. 26th and Oct. 1st 2014. Mappings, expert interviews and questionnaires were carried out in order to evaluate the impact of the relocation of an informal settlement in the Kelurahan of Pucang Sawit to an area in the Kelurahan of Mojosongo. The underlying research questions were the following:

- What are the impacts of the relocation on local livelihoods? Can the relocation unintentionally trigger up or downgrading - processes of the new settlement in the long run?
- How do members of the relocated families assess the relocation process?
- How do members of the municipal administration assess the relocation process?
- What impacts did the relocation on the livelihoods of neighbouring RWS/RTs in Pucang Sawit have?
- Has the relocation fulfilled the goals stated explicitly by the relocated families and the municipal administration?

Choosing Surakarta as a case study is appealing for various reasons. The city is known for its inclusive and participatory approach in city planning, a circumstance that is mainly connected to the former mayor and current president Joko Widodo. Two of the city's policies will be introduced in the following chapters. Firstly, the street vendor programme, which is seen as an example of best practice in local governance (DELGOSEA, n.y.). Secondly, the focus will be on the city's housing policy aimed towards improving the livelihoods of people living in slum and squatter settlement. But before, a short introduction of the city's migration and population dynamics should give better insight on the characteristics of the city.


4.1.1 Migration

Surakarta attracts a lot of people. This is mainly due to its function as an economic centre, but also because of typical factors of rural-urban migration, such as education and infrastructure. The initial phase of the migration was around the 1980s. (Winny, 2014). In recent years, the migration balance has evened out, as Figure 61 shows. In the year 2013, the migration balance was slightly positive with a net migration of 404 people, whereas in 2009 the migration surplus was more positive with a net migration of 13,534 people (BPS, 2014:41). Winny (2014) further tries to characterise the migrants coming to the city. They are mainly poor and therefore often not able to completely integrate into the given structures of the city. This contributes to a climate in which land squatting and informal housing often is the only way for the migrants to shelter themselves.

![Figure 61: In- and outbound migration in Surakarta](image)

4.1.2 Population

The city’s total population lies at 586,978 (BPS, 2014:37). This figure of the year 2013 relies on the data given by the respective Kelurahan. Another source states that the total population a little bit lower, at 507,825 inhabitants (BPS, 2014:38). The distribution and density pattern of the population can be seen in Figure 62. The map shows the population density at the level of the administrative unit of the Kelurahan and indicates that most southern Kelurahans are more densely populated than those located in the North. The southern part also is the commercial centre as well as the political centre of the city. The Sultan’s palace (Kraton) and town hall are located here, amongst commercial and office units. The northern part is less densely populated and has room left for further development (Winny, 2014).
4.1.3 Innovative policy approaches

Surakarta has often been named as a role model in Indonesian city development during the last couple of years. The current president of Indonesia and former mayor of Solo, Joko Widodo, is often seen as decisive for the positive development. The man, also known under his nickname "Jokowi", introduced the concept of inclusive economy during the electoral campaign in 2005 and is connected to new and innovative approaches in urban planning and economic development (Wirutomo, 2014:288; Von Luebke, McCulloch, & Panturu, 2009:277). Another thing which made the local governmental institutions capable of implementing policies in a more effective way is the decentralisation programme which started in 1999. The programme made room for a shift in the decision - making from higher levels to the regional and local level. Two policies implemented during Widodo’s era should be addressed here: The street vendor rearrangement and the housing policy.

Street vendor rearrangement

In the late 1990s to early 2000s, Solo saw a rapid increase in the number of informal street vendors. After an economic crisis hit the city in 1998, many people now had to rely on selling goods on the side of roads or in public spaces. This caused conflicts with the city government.
Their occupation of public space was seen as landscape degradation and a disruption of traffic. In addition, the waste produced by them was seen as a problematic. With his inclusive approach, mayor Jokowi reached an agreement to formalise and rearrange street vendors. As a first step of implementation, street vendors from the Banjarsari square were provided with kiosks in a newly constructed market hall at a market in the Kelurahan Semanggi in 2006. In addition to that, training and legal recognition have been provided. Other parts of the city saw the implementation of similar measures (UCLG, 2010). The relocation project of street vendors is seen as very successful as it brought the following outcomes (Von Luebke, McCulloch, & Panturu, 2009:283):

- Street vendors improved their economic security
- Formalisation of vendors brought revenue for the city
- Inner city is more accessible for project development and restoration

However, there are complaints issued by the vendors themselves about unequal treatment and the loss of customers in some cases (Obermayr, 2017: 137).

### 4.1.4 Housing policy in Surakarta

Solo’s slums and squatter settlements have come to the centre of the city government’s attention during recent years. Generally there are two types of sub-standard housing: inner-city slums and squatter settlements on government-owned land, graveyards, riverbanks etc. (DPU quoted by Obermayr 2017). The city has developed several strategies and policies to cope with the issues of slums and squatter settlements. These strategies are mostly based on Community-based Housing Development (CBHD). The term describes a special way of housing development which is common in Indonesia, and therefore Surakarta. Basically it means that most of the construction work is done by the local community themselves. Especially in poorer neighbourhoods, with limited access to the formal housing market, CBHD plays an important role. Policies based on CBHD are basically the Improvement of Slum Areas and the Relocation of Settlements. An example for the improvement of slum areas is the RTLH programme. The programme consists of several stages which are sketched below for the case of a slum area in the Kelurahan Kratonan (Astuti, 2013):

- **Stage 1:** Working group at community level (POKJA) is formulated by the head of Kelurahan.
- **Stage 2:** Formulation of a planning proposal for the site is submitted to the city government after getting the approval of the Kelurahan.
- **Stage 3:** Approval of aids for the programme. The beneficiaries are identified and then are eligible for an IDR 2 million grant (from UN – Habitat funds) and a micro – loan of IDR 7.5 million from a bank. Mayor Jokowi also organised a meeting with various governmental subsidiaries related to the project in order to adapt their internal programmes to the RTLH.
- **Stage 4:** Implementation of the programme. Construction work on the houses takes place. Governmental institutions carry out their enhancements. This includes clarification of land rights, improvement of the public infrastructure, sanitation, electrical supply etc.
- **Stage 5:** Monitoring. The POKJA is obliged to document and report activities after the grants and construction work is in an accountability report.

The improvement of slum areas is one approach towards bettering the housing situation in Surakarta. The following chapters will be focusing on the relocation of settlements which is
also an important tool in the city government’s effort to manage the dynamics in the city of Surakarta.

4.1.5 Relocation in Surakarta
The riverbank of the Bengawan Solo River in Surakarta, and large parts of the city itself, is affected by nearly annual flooding during the rainy season for a very long time. Figure 63 gives an overview of Surakarta City and potential flood areas.

Figure 63: Areas in Solo threatened by Flooding (Obermayr, 2012a)
After heavy rainfall in 2007 – over 600 mm in December – the resulting flooding affected more than 6000 families in the area of Pucang Sawit. Because of the low quality of many families’ houses – mostly made of bamboo and other simple building material – the city government of Surakarta decided to relocate 112 families from Kelurahan Pucang Sawit to Kelurahan Mojosongo (Obermayr, 2017). The location of the two settlement areas is represented in Figure 65. This relocation is part of the CBHD (Community-based Housing Development) a government housing initiative which was founded by the City of Surakarta in order to reduce slums and squatter settlements. Basically the CBHD contain two policies. First, there is the improvement of slum areas by rehabilitation and renovating substandard houses on-ground with certified property rights. And secondly, the relocation of settlements located along riverbanks to legal certified land and standard housing construction (Astuti, 2013). A schematic representation of the second part of the CBHD is presented in Figure 64.

Figure 64: Schematic presentation of the resettlement process (own figure, 2015)

The reasons to develop a relocation programme were explained by Gamal (2014), the City Council of Surakarta (2014) and Selfi (2014) as the following:

- Protect people from periodic flooding.
- Clear the riverbank because it is prohibited to settle there.
- Taking action against poverty
- Periodic flooding cause costs for city government for reconstructions.
- Revitalise the initially function of the riverbank.

After the decision for the resettlement was made in 2007 by the government of Solo, a collaboration was founded to develop the programme. Additional information: according to Winny (2014) the major of Solo, Joko Widodo, came up with the idea of doing relocation. Widodo, better known as Jokowi is the president of Indonesia since October 2014. Next to the city government, other parties joined like several experts in geography, architecture and urban planning. Furthermore, NGOs and the UN-habitat helped to implement the plan. To support and contact the local people directly, the Pokja and officials of Bapermas were involved as well (Gamal, 2014). Other parties which were included in the process can be seen in Figure 68.
Bapermas, short for “badan pemberdayaan masyarakat”, is the head of community development. The person is responsible for relocation and community empowerment (Sakijege, 2015).

Every involved party in the relocation programme was responsible for a certain part of the resettlement. Some parts and the appropriate responsible person will be introduced and explained next. These parts could be explained to our research team from different interviews. An overview on all involved parties (c.f. Figure 68) was prepared using additional literature sources.

Figure 65: Old settlement and relocation area in Surakarta (Obermayr, 2012b)
Financing
The whole funds for the resettlement programme were provided by a collaboration of different parties. The main actors were the national government of Indonesia, the city government of Surakarta and the CSR (corporate social responsibility). The CSR, in turn, involves other institutions, like UN-Habitat, Habitat for Humanity and an association of the Surakarta people (Sukendar, 2014). Although the riverbank is property of the city of Solo, families that took part of the programme got a grant of Rp 12 million for their land, Rp 8.5 million for their houses and Rp 1.8 million for public infrastructure. With this financial support it should be possible for the people to start a new life elsewhere, according to the government (Sukendar, 2014).

Another important role, concerning the financing of new peoples’ live, is played by the Department of Rumahan and the Office of Land Registry. These organisations’ jobs are to hand out the land certificates to the families for their new land which now belongs legally to them in Mojosongo. By having a land certificate, people are able get a loan from a bank by leaving the certificate as a deposit (Gamal, 2014).

Public Consultation
To inform the people about the programme and also about the actual process of relocation was the job of the Bapermas. To reach all affected families, meetings were organised under attendance of the city mayor. During these conventions the reasons for the relocation and the actual process in detail were explained. Furthermore, the affected families were asked if they agree to the project. By promising the people their own land, verified by certificates, and newly constructed houses they could be persuaded (Obermayr, 2017).

Search of land
To find a new place to stay within the city boundaries of Solo was the job of the responsible Pokja. However, because the Pokja’s office, with its five or six members, would have been overstrained by the work, working groups were formed. These groups consisted of so-called Subpokjas who were chosen by the affected people themselves. So in the proper sense the families themselves choose their new settlement area (Obermayr, 2017). After they agreed to settle in Mojosongo, the Pokja was informed, who then referred the plan to the Bapermas. This office had to give his blessings to the proposal and sent it to the city government, which had to confirm it once again (Sukendar, 2014).

Reconstruction
An important part of the relocation for the affected families was to get a new house. Like mentioned before, one family got Rp 8.5 million for their house on the riverbank. Next to this amount a new house was provided to the families in Mojosongo. All new houses were built by a private building contractor with a size of 40m² per building on a property of 50m², commissioned by the Pokja. The rest of the ground was used to accommodate the infrastructure. Every building only consisted of a single room with no separations on pure soil. The people were free to use building material of their former homes in Pucang Sawit to improve their new houses as required (Obermayr, 2017), as well as every other possible measurement to change their home the way they want, like enlargements or separations. Further information about the new houses in Mojosongo can be found in the part about the assessment of the relocation process. As a contact person in matters regarding the quality or building technique of the houses, the office of public works appeared (Sukendar, 2014).
Figure 66 gives a complete overview of all parties which were involved in the relocation process. The green ones are members of the national administration, the pink ones of the municipal administration, the orange ones of the local administration and the blue ones NGOs. Furthermore, the graphic shows the different working areas – white boxes - of the respective responsible party.
Figure 67: Aerial view of Mojosongo (2008 and 2014) (Google Earth & DigitalGlobe, 2014)
Figure 68: Overview of parties involved in the relocation process and their tasks (own figure, 2015)
4.2 Methodology

The methods applied to retrieve data were ten expert interviews, a questionnaire (n: 45) and GPS-based mappings.

4.2.1 Expert interviews

The interviews were conducted with local community leaders, as well as members of public authorities. Therefore two different interview guidelines (c.f. Appendix 6.2.3) were created for the different types of experts. Whilst creating the guidelines, consultation was given by a native Indonesian in order to minimise misunderstandings. If possible the interviews were held in English, some of the interviews had to be conducted using Indonesian though. With the generous help of our local guides from UNS University, Nurhadi and Wawan, it was possible to have an almost real-time translation. The character of the interviews was along the lines of a narrative interview, as described in Lamnek (2005:357 - 361). However the interviewees left room for a proximate translation after long phases of narration. The interviews were taped and the audio files further processed into a transcript. The data was analysed based on the approach of Hopf et al (1995). Thematic coding was used to define categories which were inductively developed. All this was done with the use of the software MAXQDA as well as Kuckartz (2010:84-92) for further guiding in the software-based analysis.

4.2.2 Questionnaire

The partly standardised questionnaire (c.f. Appendix 6.2.1) was created taking into account Obermayr (2017) who already conducted research in the area and also was available for consultation about the specific requirements of fieldwork in the area. Special focus was put on a simple language to provide a better and clear understanding of the questions asked. The questionnaire was developed in English and then translated into Indonesian. With the help of UNS students we were able to conduct the questionnaire, since the people asked were not familiar with the English language. A pre – test was done in the same neighbourhood the day before the actual field research took place. The data contrived from the questionnaire was then processed using the SPSS statistical software. As a guideline in the analysis of the data, Mattisek et al. (2013:72-125) provided background information.

4.2.3 Mapping

A GPS – based mapping was carried out in order to receive complementary data. This data was used to serve as an extra source and to put the statements derived from the interviews into perspective. The GPS data was conducted with Juno handhelds and processed using the ArcGIS software package.

4.2.4 Methodological reflections

Doing fieldwork in a foreign country brings along a lot of extra and sometimes unforeseeable challenges. Preparations were made concerning aspects of a cultural gap and the
introduction to basic level Indonesian. However, some difficulties were experienced during the fieldwork. The use of basic language was one of the focuses during the development of the questionnaire. Upon reflection, this did not completely work out, as there still was confusion about some of the terms used. Another thing which has to be taken into account is the character of the Javanese culture. During the fieldwork, we made the experience such that the interview partners often were too polite to speak their mind and openly criticise things. Criticism is shown in a very subtle way and therefore often hard to detect. Some help was given by our Indonesian co – students and translators, still there certainly were some nuances that got lost due to this circumstance. Last but not least, the language barrier can be challenging at times. Translating from Javanese or Indonesian into English, forces the interviewee to take breaks from narrating in order to give room for a proximate translation. This can, in some cases, disturb the flow of an interview session.

4.3 Impacts of the relocation on local livelihoods

This chapter tries to answer the following research question: What are the impacts of the relocation on local livelihoods? Therefore its focus lies on the people who relocated from Pucang Sawit to Mojosongo and how their livelihoods were influenced by the relocation. Based on these impacts we take an interest in the future development of the new settlement in Mojosongo by asking: Can a relocation unintentionally trigger up or downgrading-processes of new settlements in the long run? As mentioned in the introduction, the methods applied to retrieve data were ten expert interviews, a questionnaire (n: 45) and on-site mappings. In order to answer the stated research questions of this chapter, expert interviews and data derived from the questionnaire were the most valuable sources.

4.3.1 The livelihood approach

Before the collected data will be analysed, some basic information about the term “livelihood” and the livelihood approach will be given. Followed by an explanation of how this approach was used and adapted for our fieldwork. Livelihood studies caught attention in the realm of development studies in the late 1990s and early 2000s, when the DFID (British Department of International Development) promoted the so-called “sustainable livelihoods framework”. The initial foundation of the livelihood approach however took place a few years earlier. Chambers & Conway (1992) are often mentioned for creating the foundation of the sustainable framework approach and formulating one of the first definitions for livelihood. Based on this definition, The DFID formulated what is one of the most widely-used definitions of livelihood: “A livelihood comprises the capabilities, assets and activities required for a means of living. A livelihood is sustainable when it can cope with and recover from stresses and shocks and maintain or enhance its capabilities and assets both now and in the future, while not undermining the natural resource base.” (DFID 1999:1)

4.3.1.1 Core Principles

Whereas the livelihoods approach should be flexible and adaptable to specific settings, it underlies a number of core principles listed by the DFID (1999: 5pp.):

- **People-centred**: The people themselves are actively included. Their views, goals etc. are fully respected and considered.
- **Holistic**: All different kinds of actors, strategies and influences should be involved in the approach
- **Dynamic**: The dynamic nature of the approach should be acknowledged. External and dynamic effects on livelihoods, such as shocks and trends, are considered.
- **Building on strengths**: Focusing on the strengths and inherent potential of the people helps them to empower themselves and encourages them to reach their own goals.
- **Macro-micro links**: Decisions on a macro-level often influence processes on micro level and vice versa. The livelihoods approach tries to focus on both levels and stresses the importance of the links connecting the two levels.
- **Sustainability**: A livelihood can be called sustainable if it’s resilient towards external shocks and independent from external support whilst not compromising the livelihood options of others.

### 4.3.1.2 The sustainable livelihoods framework

This framework (c.f. Figure 69) is one of the key elements of the sustainable livelihoods approach and can be used as a heuristic for the investigation of livelihoods of the poor.

![Figure 69: The sustainable livelihoods framework (FAO, 2003:4)](image)

The framework shows the main factors of people’s livelihoods and how they interact with each other. It portrays the stakeholders in a context of vulnerability in which they have access to certain assets. These assets are utilised through the prevailing environment (transforming structures and processes), which are of dispositive influence for the livelihood strategies. The livelihood outcome is the goal, which the people try to achieve by applying certain livelihood strategies. To further explain the framework, its elements will be described in the following paragraphs following the works of the DFID (1999) and Kollmair & Gamper (2002).

**Vulnerability context**: This context represents external factors, such as trends, shocks or seasonality. Not all the factors in this context have to be considered negative. Trends or seasonality, for example, could also open up new possibilities for the people affected. Of all the elements in the framework, it is the one which lies furthest from people’s control, but directly influences people’s assets.

**Livelihood assets**: The assets pentagon (c.f. Figure 69) is probably the most characteristic and well-known element of the framework. It is a visualisation of people’s resources which they are able to use in order to better their livelihood outcome. The pentagon is divided into different types of capitals or assets: physical, social, human, natural and financial. The
pentagon’s shape therefore shows schematically different variations and combinations of people’s access to the specific assets. It is also important to note that assets are related to each other. For example it could be possible that strength in one asset compensates for weakness in other areas, or that there is a particular combination of assets which leads to a positive livelihood outcome.

**Transforming structures and processes:** They describe legislations under which livelihoods develop. These factors could operate at any level, from household to international scale. Furthermore, they determine access and terms of exchange between different types of capitals. Structures are the “hardware”, private and public organisations that influence the disposition of capitals. Examples from the private sector would be commercial enterprises and corporations or NGOs, whereas political or judicial bodies are examples for structures in the public sector. If structures are the hardware, then Processes constitute the software. They determine the interaction between structures and individuals. Important processes for livelihoods are policies, power relations or legislation and institutions – several types of them can also overlap or oppose each other.

**Livelihood strategies:** These strategies comprise the variety of activities and choices that people undertake in order to achieve their livelihood goals. The strategies have to be understood as a dynamic process - people combine activities to satisfy their needs at different times and different geographical and economic levels. Livelihood strategies rely on the access to assets. The general principle is that people who are well-equipped with assets are more likely to have more options to choose from in order to make a positive livelihood. It is also dependent on the policies and institutions involved in it though, which links it to the element of transforming structures and processes.

**Livelihood outcomes:** Livelihood outcomes are the results or achievements gained from livelihood strategies. Examples of that could be more income, but also increased well-being, reduced vulnerability, improved food security or a more sustainable use of natural resources. Therefore outputs directly influence assets, which then offer a new starting point for strategies and outcomes. Additionally it should be mentioned that people compete for jobs, markets, resources etc., which makes it difficult for everyone to improve their livelihood simultaneously.

**4.3.1.3 Adaption of the livelihood approach**

According to our first research question, fieldwork should reveal how the livelihoods of relocated people changed. Therefore the sustainable livelihoods approach and its framework have been used and modified to fit local settings. Within the framework, the main focus of the fieldwork was on the assets and their dynamic. The DFID (1999) also emphasises the importance of change when trying to understand assets by saying that it is imperative to incorporate a time dimension into any analysis of assets. The aim is to take into account all types of assets: physical, financial, human, social and natural capital. Further interest lies in the vulnerability context since it was crucial to the relocation. Choosing to focus on people who were relocated from Pucang Sawit to Mojosongo, the conducted household survey is a valuable source of information. Out of the 112 households in the research area interviews were conducted from 45 households. The settlement in Mojosongo is predominately inhabited by people who relocated from Pucang Sawit. However three of the interrogated households moved in from elsewhere. The focus of the analysis will be on the 42 households who were part of the relocation programme and moved from Pucang Sawit.
4.3.2 Impact of the relocation on local livelihoods in Mojosongo

This chapter gives an overview on changes the relocation brought to affected households. The sustainable livelihood framework will be used to contextualise the findings of the fieldwork and interpret them. The main focus will lie on the change of the assets with a short analysis on how the vulnerability context has changed.

4.3.2.1 The Vulnerability Context

As mentioned in chapter 4.3.2.1, the vulnerability context contains external factors that influence the livelihoods of people. This chapter therefore discusses if and how the relocation had an impact on this topic.

Due to the riverside location of the settlement in Pucang Sawit, the area is extremely prone to flooding. The households were challenged with a yearly flood event. The city government's take on dealing with the situation was giving financial aid to the people after a flood occurred. Triggered by the unusually big flood event in 2007, the city government gradually implemented a relocation programme that started in 2009 (Sukendar, 2014). The relocation to the new settlement area in Mojosongo marked a fundamental change in the vulnerability context of relocated households. The former dominant threat of frequent flooding can be neglected since the new settlement is no longer prone to flooding (Pah Agus Triyono, 2014).

On the other hand, the new settlement area is not completely immune towards natural hazards, as numerous expert interviews indicate. (Gamal, 2014) and (Pah Agus Triyono, 2014) identify landslides and floods as natural hazards for the new settlement area, bringing into play new processes which determine the vulnerability context. Since the relocation programme could be classified as a process in the Sustainable Livelihoods Framework (SLF), this development can be seen as a prime example of the interaction between Transforming Structures and Processes and the vulnerability context within the SLF (c.f. Figure 69). The implementation of a process heavily influenced the vulnerability context by removing its former dominant factor. The repercussions of this affected numerous other elements of interest. Especially assets were (in-) directly influenced by this development.

4.3.2.2 Impact on human capital

Human capital contains strengths such as skills, knowledge, ability to labour and good health. It can also be understood as a factor of the amount and quality of labour available. Further significance stems from the fact that human capital is required in order to use any of the other types of assets (DFID, Sustainable Livelihoods Guidance Sheets. Department for International Development., 1999). Healthcare is one of the main tasks for the local government of Surakarta (Pah Agus Triyono, 2014). Access to medical care is a decisive factor when it comes to improving health conditions. A comparison between the access to medical care in Pucang Sawit and Mojosongo gives a positive outlook on the situation. More than half of the interviewed households (57%) stated that Mojosongo has better access to medical care.
Another element which comes into play when talking about the human capital is the access to education (c.f. Figure 71). In contrast to the access to medical care, change on the access to education is much more indifferent. Unfortunately there is not enough data which could give insight into any reasons behind that. It should be added that access to educational institutions cannot be translated directly into access to education, since the latter term is not only based on the geographic location.

Due to the fact that no direct indications (e.g. infant mortality rates) about the health, education or knowledge were conducted, it is somewhat difficult to make certain assumptions about the human capital. However it is likely that better access to medical care or educational institutions has a positive impact on human capital. While the access to medical care seems to be better in Mojosongo, no definite assumption can be made on the access to educational institutions. One thing which should be noted on the side of positive impacts is a governmental sub programme within the relocation programme, aimed to improve working and economic skills (Pah Agus Triyono, 2014). It seems that the programme made an impact, as it is stated in Interview 13 that the people who used to work as garbage
collectors now are able to establish small businesses or household-based industry and handicraft (c.f. Figure 72). This indicates that the programme made a positive impact on the people’s knowledge and education.

4.3.2.3 Impact on social capital

The DFID (1999) constitutes social capital as social resources upon which people draw in pursuit of their livelihood objectives. In order to do so, it is necessary to develop them through networks and connectedness, which create a sense of trust and ability to work together and make it possible to access wider institutions, such as political or civil bodies and memberships of more formalised groups and their systems of rules, sanctions and norms. Access to social capital can be determined by birth, age, gender or social class. The circumstance that people are members in groups or networks also entails that some people may be excluded from institutions, which could exclude them from benefits as well. However social capital still has a big importance by improving the efficiency of economic relations or prevention of the "free-riding" problem (Kollmair & Gamper, 2002:6).

Regarding the research area, the impact on the social capital seemed particularly interesting, since the destruction of social networks is one of the main concerns about relocation programmes. One of the first impacts of the relocation programme on the social capital was that during its initial phase participatory meetings and workshops took place. Pak Sukendar (2014) mentions that "the mayor of Surakarta hosted a number of many meetings together with the people concerning what they want to do, concerning what they are about to do and concerning the future they are going to build in the relocated area." The meetings and workshops are able to create social ties and empower the community and therefore influence the social capital in a positive way.
The fact that the people affected by the relocation got organised also became apparent in a protest against the relocation programme. While many were in favour of the programme, there were also groups opposing it, which ultimately lead one group to go to court and sue the government (Sukendar, 2014).

Probably the strongest form of network that has been built during the duration of the relocation programme is the "Pokja". *Pokjas* are working groups dealing with the relocation. The *Pokjas* represent the community and can be divided into sub-*Pokjas*. The main task of them is to coordinate the relocation by communicating with the government, choosing the new location of resettlement and governing the community-level relocation process. This also helped to meet the people's desire to move to the new area as a group, together with their neighbours (Winny, 2014).

![Comparison of the social network](image)

Figure 73: Comparing social networks between Pucang Sawit and Mojosongo (own figure based on the questionnaire, 2015)

Figure 73 shows that only seven percent of the households interviewed had the impression that the social network in *Pucang Sawit* was better. This shows that the relocation programme was rather successful in keeping the social network viable. The impact of the programme on the social capital therefore can be seen as mostly positive. This is due to the fact that the community involvement in the relocation through *Pokjas* strengthened networks and grade of organisation among people. Furthermore Figure 73 shows that only a small portion of the people favoured the social network in the old settlement area, whereas the majority thought the situation had stayed the same or improved. Selfi (2014) describes the situation as follows: “But after people are resettled in the new area then they became to be involved for their participatory working together to empower themselves to do something, to do things that can enhance their living conditions.”

### 4.3.2.4 Impact on natural capital

Natural capital describes diverse natural resource stocks. From these stocks, resource services and flows useful for livelihoods originate. There is a wide variety of stocks and resources, reaching from biodiversity to trees or land used for agricultural production. This makes it especially valuable for people dependent on natural resource-based activities, such as farming, fishing etc. However natural capital also is of general importance, for example because of the positive impact of good air and water quality on health and other factors (DFID, Sustainable Livelihoods Guidance Sheets. Department for International Development, 1999).
Firstly it has to be said that the area is not rural and agricultural operations are not present at a large scale. However there are some areas used for growing vegetables or chicken farming (c.f. Figure 74). The character of these activities could be described as small-scale urban farming. The restricted size and importance of agriculture makes the area not as dependant on natural capital as, for example, a rice farmer community.

![Figure 74: Areas used for gardening in Mojosongo](own figure, 2014)

Of further interest for assessing the natural capital is an area in the southernmost part of the settlement, where a garbage heap is located (c.f. Figure 75). Although it was mentioned in an interview that "They have a programme how to collect the garbage" (Pah Agus Triyono, 2014); the garbage disposal still seems to cause problems and is having a negative impact on the local environment and therefore on the natural capital.

Apart from the problems with solid waste, the natural capital is considered to be better in Mojosongo than in Pucang Sawit. This is also stated by Winny (2014), who thinks that physical and environmental conditions have improved. Still some problems are present in form of a garbage heap in the southernmost part of the settlement, indicating that the disposal of solid waste has not been fully formalised.
4.3.2.5 Impact on physical capital

Physical capital contains the basic infrastructure and producer goods needed to support livelihoods, such as affordable transport, secure shelter and buildings, adequate water supply and sanitation etc. An example for the influence of physical capital on income generation would be the installation of an irrigation system. Without it, long periods of time would be spent on the collection of water - binding labour, which could be used somewhere else. A thing which has to be kept in mind when thinking about infrastructure is that not only its existence is of importance but also the pricing and secure spatial and institutional disposition for all groups of a community (DFID, Sustainable Livelihoods Guidance Sheets. Department for International Development., 1999). The chapter about physical capital is split into changes in the housing situation and the infrastructure.

Housing

Concerning the housing situation in the old settlement area, it can be said that the quality of housing was "sub-standard" (Winny, 2014) with houses mostly built from bamboo (Budi, 2014). The relocation brought significant change to this situation; quality of housing could be improved through an 8.5 million IDR grant which was provided for the construction of houses. The grant was approved by the local government of Surakarta and then handed to the Pokja as part of the relocation programme. The Pokja then gave the job to construct the new houses to a private building contractor who then built similar houses for the beneficiaries. One thing that became apparent in the questionnaire was the mixed opinions about the houses provided. Four out of 45 households explicitly mentioned the housing situation when asked about the benefits they expected of the relocation. Three of the households confirmed that their expectations concerning the housing situation have been met, whereas one household said that they "expected to get a real house, not just an
unfinished one" and that they had to "renovate" the house. This opinion appears to be more widespread than it seems at first glance. When asked about things which could be done to improve the relocation process, 15 out of 42 households mention that the housing situation should be improved. Statements reach from demands for bigger and better houses to more particular suggestions like "the design of the houses should be observed by the authorities" or "roof should be improved". This indicates that the housing situation in the beginning was not sufficient. The fact that almost 93% of the households questioned modified their house further, shows the people's need to improve the houses they were provided with initially.

The majority of the people added a porch to their house; enlargements and partitions are further popular modifications (c.f. Figure 76). Slightly more than half of the households also conducted modifications that fall under the category "other", predominantly concerning the floor and walls of the houses, but also kitchens were installed for example (c.f. Figure 77).
The numerous modifications of the houses result in heterogeneous standards of housing, with some houses still being almost in its original form (c.f. Figure 78), while others even received the addition of extra floors (c.f. Figure 79).

Figure 78: Unmodified house in Mojosongo (own figure, 2014).

Figure 79: Modified two-storied building with balcony in Mojosongo (own figure, 2014)
When asked about differences between the two sites concerning the housing quality, it becomes clear that most households think the quality of housing is better in *Mojosongo* and therefore agree with the statements derived from the expert interviews. However, it seems that the size of a majority of the people’s houses in *Pucang Sawit* was bigger (provided that better means bigger) (c.f. Figure 80). This and the numerous construction and modification activities could be the main reasons for the discontent with the provided houses that was mentioned above.

[Figure 80: Comparison of housing quality (own figure based on the questionnaire, 2015)](image)

Generally it can be said that the quality of housing has improved. However there was dissatisfaction with the provided houses in *Mojosongo*. Modification and additional construction work have changed most of the housing infrastructure, so that only a few houses kept their original form. The volume of the 8.5million grant can be considered as too low to provide satisfactory housing through a private building contractor.

**Infrastructure**

After assessing the housing situation, a further look into the infrastructure of the sites should give some insight on the physical capital. Selected basic infrastructure facilities (disposal, electrical supply, water supply and sewage system) have been included in the field questionnaire.

When questioned about the difference of infrastructural facilities between the old and the new site, a striking majority thought of *Mojosongo* as the place with better infrastructure. However this does not apply for waste disposal, where the opinions differ. One thing that could play a role is that "(...) maybe in the old area they just put the garbage in the river" (Pah Agus Triyono, 2014), a very convenient way of waste disposal. This could lead to the perception that it was easier and more convenient to get rid of trash in the old area, a thought that can only be speculated about at this point. It has also been made clear in the chapter about human capital that the garbage disposal is not working ideally, with a waste dump in
the southern part of the settlement. Nevertheless the water and electrical supply as well as the sewage system have improved, which also mirrors in the expert interviews conducted. "I think good, construction good, there is road and sanitations" as Interviewee 11 describes the situation on the new site in *Mojosongo*.

All in all the relocation had a positive impact on the physical capital. This is due to the improvement in almost all the basic infrastructure facilities, such as water or electrical supply as well as improvements in the quality of housing. While the quality of housing seems to have improved, a reasonable amount of people was unsatisfied with the houses provided when they initially moved there. Improvements of these houses are widespread, with over 90% of the households having done construction work to modify their home.

### 4.3.2.6 Impact on financial capital

Financial capital is considered to be financial resources that people use in order to meet their livelihood objectives. Two main sources of financial capital can be detected:

- **Available stocks:**
  - cash, bank deposits or liquid assets such as livestock or jewellery.
  - These are usually independent of third parties.

- **Regular inflows of money:**
  - labour income, pensions etc. These are mostly dependent on others.

The financial capital is probably the most versatile of all the five categories of assets since it can be converted into other types of capital or it can be used for directly achieving certain livelihood outcomes (e.g. purchasing food to reduce food insecurity) (DFID, 1999). The people involved in the relocation programme were poor people when living in *Pucang Sawit* (Gamal, 2014). Through training programmes etc., mentioned in the chapter about human capital, they were able to better their economic situation. However most of them are still working in low-skilled jobs such as small handicraft activities. A more detailed look into
how the income of the people has changed after relocating is allowed through data retrieved from the questionnaire.

![Change of the monthly income](image1.png)

**Figure 82:** Change of the monthly household income due to relocation (own figure based on the questionnaire, 2015)

As stated in Figure 82, it seems that the majority of households were able to keep their income at the same level (20 households) or even increase it (15 households). Five households saw a decrease of their income. To put the data in context the development of expenditures was also examined.

![Change of monthly expenditures](image2.png)

**Figure 83:** Changes in monthly household expenditures due to relocation (own figure based on the questionnaire, 2015)

Since the expenditures have mainly increased (20 households) or stayed the same (18 households), the positive outlook gained from the development of monthly income is put
into perspective. Accounted for rising expenditures are higher transportation costs or the cost of water and electricity supply among other factors. To further investigate how the income situation has changed, attention was brought to the relation between expenditures and income.

<table>
<thead>
<tr>
<th>expenditures</th>
<th>expenditures</th>
<th>expenditures</th>
</tr>
</thead>
<tbody>
<tr>
<td>&gt; income</td>
<td>= income</td>
<td>&lt; income</td>
</tr>
<tr>
<td>Mojosongo</td>
<td>6 (16 %)</td>
<td>19 (50 %)</td>
</tr>
<tr>
<td>Pucang Sawit</td>
<td>2 (5 %)</td>
<td>24 (63 %)</td>
</tr>
</tbody>
</table>

Table 8: Relation between expenditures and incomes¹

(own table based on the questionnaire, 2015)

Table 8 shows what appears to be a change in the distribution of expenditure-income patterns, resulting in a rise of inequality in the new settlement area. Whereas in Pucang Sawit the bulk of the households (63 %) had equal expenditures and income, the situation in Mojosongo shows growth in the categories of “expenditures < income” and especially “expenditures > income”. These findings have to be considered with caution though, since only 38 interrogated households have been considered, whereas 112 families have been relocated to this site. This makes up for a relatively high sampling error of 12.98%.

Of further importance for the financial capital is the access to loans. On this subject the relocation could have a positive impact, as owners of land certificates have access to loans from banks (Sukendar, 2014; Selfi, 2014). As further discussed in chapter 4.6.5, not all of the relocated families received their land certificate yet, a circumstance that still excludes them from proper access to bank loans.

To sum up the impact of the relocation on the financial capital the following can be said: A very positive-looking first impression with rising income and improved access to loans has to be put into perspective. Rising expenditures and missing land certificates leave room for improvement. There are hints indicating a trend towards more inequality in the new settlement area. This opens up a discussion whether or why some people benefited more from the relocation programme than others. However further investigation is needed to confirm this tendency.

4.3.3 Outlook on possible future developments in Mojosongo

While the chapters above focus on impacts on different livelihood assets, the following paragraphs focus on the sub-question “Can the relocation unintentionally trigger up- or downgrading - processes of the new settlement in the long run?”

One element which can serve as an indicator of up- or downgrading processes is the development of land prices. Expert interviews confirmed that land prices in Mojosongo and around the new settlement are rising. (Gamal, 2014; Sukendar, 2014). Sukendar (2014) gives a good sketch of the dynamics taking place. He mentions that before the new settlement was built, the area was almost abandoned; nobody was interested in living there. What sparked

¹ If a higher monetary class has been picked for expenditures than for income it is put into the column “expenditures > income”. The same logic has been applied for the rest of the columns. For monetary classes please check the questionnaire in the appendix.
the development of the area was the construction and establishing of the new settlement and infrastructure. After this took place, people from other areas also noticed the potential of the area and started moving there. This growing demand caused the observable increase of land prices around the new settlement. Another factor indicating a possible upgrading of the area is the implementation of a new bus line to the area.

The development of the area is seen especially positive by Winny (2014), who puts it in a city-wide context. The reason for this is that she sees this as an opportunity of a much needed development of the northern part of the city, since the southern part is already densely populated with traffic issues and other problems adjutant to overpopulation.

It is not yet clear how the new settlement will look like in the long run, but it is already changing its surrounding area, which saw an increase in the land prices and the addition of a new bus line. This leads to the assumption that further development can be expected in the area, also taking into account that there is space and room for it.

4.3.4 Conclusions

The relocation had various impacts on people’s livelihood assets. On the one hand it can be said that generally the access to assets has improved. On the other hand, new challenges have surfaced. Table 9 summarises some of the main impacts and changes mentioned in the previous chapters. The effect these changes/impacts have brought to the different assets is displayed in the columns, with ‘+’ indicating a positive, ‘‐’ a negative and ‘~’ an indifferent effect.

Table 9 shows that improvements could be determined in the field of human capital. The programme implemented to better the economic skills of the people seems to be working, as many of them are able to work in higher skilled jobs than before. Further improvements can be detected in the social aspect. The satisfaction with the social network in Mojosongo is rather high, with 50% of the households questioned preferring Mojosongo over Pucang Sawit and 43% stating that the quality of the social network has stayed the same. Concerning the natural capital it seems that circumstances have more or less stayed the same, with waste disposal problems still posing a threat towards environmental conditions. The impact on the physical capital can be described as positive. Basic infrastructure needs can be satisfied in the new settlement that also provides a better quality of housing. However, concerns with the size of the initial houses show that the process of providing the house was not fully satisfying. On the topic of the financial assets, it should be stated that although many households could improve their income, monetary concerns are still present for most of the families since expenditures have risen as well. The change in the distribution between financially strong and weak households seems to open up a new field of interest. Inequality seems to be more of a topic in Mojosongo than it was in Pucang Sawit; however this statement still needs some more consolidation and further research.
<table>
<thead>
<tr>
<th>Impact/Change</th>
<th>Physical capital</th>
<th>Social capital</th>
<th>Human capital</th>
<th>Natural capital</th>
<th>Financial capital</th>
</tr>
</thead>
<tbody>
<tr>
<td>Access to education</td>
<td>~</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Access to medical care</td>
<td></td>
<td>+</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Economic training</td>
<td></td>
<td>+</td>
<td></td>
<td>+</td>
<td></td>
</tr>
<tr>
<td>Participatory workshops &amp; meetings</td>
<td>+</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Introduction of <em>Pokjas</em></td>
<td>+</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Garbage disposal</td>
<td></td>
<td></td>
<td></td>
<td>-</td>
<td></td>
</tr>
<tr>
<td>Quality of houses</td>
<td>+</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Size of houses initially provided</td>
<td>-</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Basic physical infrastructure</td>
<td>+</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Income</td>
<td></td>
<td></td>
<td>+</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Expenditures</td>
<td></td>
<td></td>
<td></td>
<td>-</td>
<td></td>
</tr>
<tr>
<td>Access to loans</td>
<td></td>
<td></td>
<td></td>
<td>~</td>
<td></td>
</tr>
</tbody>
</table>

“+” positive  “−” negative  “~” indifferent effects

Table 9: Overview on impacts and effects on different forms of capital (own table, 2015)
4.4 Assessment of the relocation

4.4.1 Information about the data collected

The process of relocation has potential for different assessments by the involved persons and administrative. To assess potential disparities in this perception data concerning the relocated families and the municipal administration was collected. The goal was to distinguish the various differences and also commonalities of the relocation process of the two involved parties. Our motivation was to find out how successful the process of relocation was for the different involved parties. Furthermore how the different tasks of the programme used to function and what changes the relocation brought to the resettled families and also the ones that stayed in Pucang Sawit. All in all, 45 questionnaires were filled out by relocated families, 42 of them were used in this analysis. In addition twelve interviews with actors of municipal administration bodies and heads of local communities took place. So quantitative and qualitative data were collected and contrasted in conclusion. The following two chapters will point out the methods used and the results generated. Terminating there will be a comparison of the different perceptions, furthermore, a conclusion and a short discussion.

Figure 84: Interview with a relocated woman in Mojosongo
(own figure, 2014)
4.4.1.1 Resettler’s perspectives on relocation

To evaluate the assessment of the process by the families that were relocated, one section of the questionnaire dealt with the personal perception of the interviewee regarding the relocation process. This chapter of the questionnaire includes six questions. Five of these – number 19 to 23 – are used and evaluated in this chapter and serve as a data basis for the following statements. So only a subsample – focusing on the perception of the relocation process – of the field-questionnaire will be used for further analysis in this chapter. For the evaluation incorrect or missing answers were not considered, resulting in a varying number of respondents. A copy of the questionnaire can be found in Appendix 6.2.1.

The Questions no. 21 to 23 dealt with the satisfaction of the relocation process and possible improvements. The participants were asked to define their satisfaction in a scale of four options, ranging from very unsatisfied, unsatisfied, satisfied to very satisfied. In the two consecutive questions the participants were questioned to explain their assessment and to state anything that could be improved.

Furthermore two questions (no. 19 and 20) dealt with the participation -possibilities in the relocation process. It was asked whether the household was involved in the planning process of the resettlement and whether the family could make requests in matters of the resettlement. The aim of those questions was to find out if participatory processes carried out had any correlation with the individual satisfaction regarding the relocation process.

During the interview process and the collection of the quantitative data, it appeared that the assumptions, which were made by the research team in aspect of the relocation process, are not liable for the on-site prevailing assessment of the importance of the relocation process. It seemed that the local population was not mainly concerned about the process of the relocation itself, but is more focused about its outcomes. In other words the families are very likely more interested in material things than in issues concerning the process. It also might be possible that the question was not posed explicit enough or simply misunderstood. This was found mainly expression in the answers of the question of why the participants assess their satisfaction or non-satisfaction with the process of the relocation in the way they did. The patterns show that answers do mainly not relate directly to the process of relocation but to its final outcome. Only a small percentage of the interviewees gave answers which can be linked literally to the relocation process. It also might be possible that the interviewees answered correctly to the question but it was noted in a distortive way. This could result from a loss of information between our interpreters and the respective interviewer. One should always keep this circumstance in mind when looking at the evaluation. Nevertheless it was decided to evaluate the answers anyway to see if the interviewees named any other aspects which are important for them, but of which we did not think of before. Furthermore – in the team’s opinion – the answers cannot be detected as false anyway. Moreover there might be a possibility to however link the given answers to the relocation process. All answers can be looked up in the clustering of the different answers (c.f. Appendix 6.2.2).

4.4.1.2 Analysis

First of all, it is striking how satisfied the relocated families are with the process of the relocation in general. Figure 85 provides an overview on the level of satisfaction. About three quarters of all interviewees assess the process positive or very positive and only one quarter is unsatisfied or very unsatisfied. In absolute numbers this would be every fourth household. Since more than half of respondents choose “very satisfied” this reveals the high level of satisfaction among the relocated households. By evaluating the corresponding assessments of the different statements we can conclude that 76% of all interviewees assessed the process of relocation as satisfactory and 22% as non-satisfactory, what is corresponding to the percentage of the previous question.
This is leading to the question why the interviewed persons answered in this way. The question can be answered by looking at the results of question no. 22 of the questionnaire. To evaluate this open question, answers were clustered, rephrased in uniform statements and allocated in six different categories. Table 10 provides an overview of the different categories, together with the corresponding overall 20 statements. The complete clustering, including the originally phrases is provided in the annex (c.f. Appendix 6.2.2).

<table>
<thead>
<tr>
<th>Category</th>
<th>Statement</th>
</tr>
</thead>
<tbody>
<tr>
<td>Status / Government</td>
<td>no certificate yet</td>
</tr>
<tr>
<td></td>
<td>Grateful to the government</td>
</tr>
<tr>
<td></td>
<td>Got the house but no certificate</td>
</tr>
<tr>
<td></td>
<td>Got land certificate</td>
</tr>
<tr>
<td></td>
<td>Got house and land certificate</td>
</tr>
<tr>
<td>House &amp; Infrastructure</td>
<td>Worst house</td>
</tr>
<tr>
<td></td>
<td>More infrastructure needed</td>
</tr>
<tr>
<td></td>
<td>Improved technical infrastructure</td>
</tr>
<tr>
<td></td>
<td>Building is not good</td>
</tr>
<tr>
<td></td>
<td>Better house</td>
</tr>
<tr>
<td>Natural Hazard / Security</td>
<td>No more flood</td>
</tr>
<tr>
<td></td>
<td>Feel safer</td>
</tr>
<tr>
<td>Economic Situation / Costs</td>
<td>Increased income</td>
</tr>
<tr>
<td></td>
<td>No costs for moving</td>
</tr>
</tbody>
</table>
The following two passages will deal with a quantitative analysis of the main categories and statements of the two different ratings presented before in Table 10. In absolute numbers 36 people assessed the process of relocations as positive, being satisfied or very satisfied. The following chart shows the composition of the different categories.

Subsequently the four most frequent answers will be analysed further. All other comments were given only once or twice and can be looked up in the annex (cf. Appendix 6.2.1). Figure 86 gives an overview of the main categories of the positive answers. By reading the following section this graph should help to classify the statements in the complete data basis.

It is firstly evident that the land status or governmental aspects are most important for a positive evaluation of the relocation process. Issues concerning their house and all kinds of infrastructure in Mojosongo take second place, followed by natural hazards and aspects of security. Even though we can see in the interviews that the members of administration stated the exposure to natural hazards as the main reason for the relocation (c.f. chapter 4.6.), this argument only comes third in the evaluation of the process. Obviously the land title is of higher importance for the resettled households. This fact can be proven by looking at the
majority of positive assessments – compare to Figure 87. Getting the land certificate was the most frequently given - eight of 36 - answer to the question why the people assessed the process as a positive one. The reduced flood risk in Mojosongo is only the second most important. Another important category deals with the economic situation or the costs for the families in general as mentioned for example by increased income.

The answer “no other choice”, the other third most answer, allows the conclusion that possibly people had not really thought about the process before. This might result from the fact that they had no say in the process. This rather seems to be a justification for a negative assessment but on the other hand this could also result from even though the affected families had no other choice than to take part in the resettlement; they assess the process nevertheless as positive. So there is no conclusive explanation for this answer.

![Figure 87: Most prominent reasons for being satisfied with the relocation process](image)

Another question in the questionnaire that contributes to answer the question how the relocated families assess the relocation programme is, if the household was included in the planning-process (question 19). Here the households are asked if the household he is part of was included in the planning process of the resettlement. 74% stated that they were included and 26% found they were not. This matches statements given by the Keluharan of Mojosongo. By talking to the Office of Community Empowerment in the city council of Surakarta, it was pointed out that the affected people were involved in the planning, for example by deciding where to move. This statement is supported by comments given during several other interviews. To evaluate whether the inclusion in the planning process is contributing to the overall satisfaction with the relocation process in general a cross tabulation was made (c.f. Table 11).

Looking at the results it becomes obvious that being included in the resettlement planning process has only a low influence on the level of satisfaction. In absolute numbers, the number of people who were included in the planning and also at the same time being very satisfied with the process is highest. However the difference between being included or not, only ranges from zero (very unsatisfied) to five (satisfied) people. Especially when looking at the most positive assessment there is only a small difference of two people being included in the planning process or not. Considering all classes, this trend concerns all interviewed persons except the very unsatisfied ones. In this category the number is equal. Nevertheless there is a clear, although not very distinctive, tendency that households who were included in the planning-process tend to be also more satisfied with the whole process.
Question number 20 also provides helpful results for analysing the assessment of the relocation process by the consulted households. On this issue the interviewees should answer if they were able to make requests in regarding the resettlement. About two third (59% out of 42 respondents) said that they were able to do so, while a bit more than one third or 41% denied it.

This chart gives a different impression than the one before did. Table 12 is not assessing a possible correlation between the level of satisfaction and the option to make requests throughout the process. Here it became evident that there is no clear link between being able to make requests and the satisfaction with the relocation process. To put it in another way, it seems unimportant if the people can make suggestions, they are mostly satisfied with
the relocation process nevertheless. What is verifying this statement is the fact that the box with the highest value corresponds to households which could not make requests but are very satisfied however. This time the difference in one satisfaction-class is quite high, between two and six persons. Furthermore most of the people who could or could not make requests assessed the relocation process as very satisfactory for them. So as a conclusion it can be said that being able to make requests in matters of the resettlement has no influence on the assessment of the process in general.

Statistical analysis of the survey data was conducted using a chi-squared test for the null-hypotheses of satisfaction being equal among groups of "involved vs. uninvolved" (p=0.6294) and "programme inquirers vs. non-inquirers" (p=0.164), respectively. The chi-squared-test was used instead of a Mann-Whitney U test because of ranking problems in the data (i.e. there were only four different manifestations of the dependent variable, which makes ranking inefficient). However, all tests were non-significant indicating that there is no difference between the groups. Due to the small sample size, the p-values of the chi-squared test are not precise.

To conclude the quantitative evaluation of the research question it is necessary to know if people come up with possible improvements of the relocation process. This open question no. 23 of the questionnaire concludes the section on the issue of the personal perception of the relocation process. The results were clustered and compared in the same way as presented as in case of question 22. This time answers belonged to three categories only – compared to Figure 65. In addition to this an assessment of the answers was done to further investigate the improvements related to the process itself and on other issues. As a conclusion, ten of all answers - 21% - were categorised concerning the category "process" and assigned the statement "no improvement". In other words, nearly one fourth of all interviewees do not think that the relocation process can be improved or do not have any idea how or what to improve in particular. An extraordinary fact is that by looking at the percentages of the positive and negative replies we see the same ones as in question 22, - the households have been asked why they are satisfied or unsatisfied with the process of relocation - however the other way round. Table 13 gives an overview of the three quarters of all answers that have been assessed as possible improvements for the process of relocation.

<table>
<thead>
<tr>
<th>Category</th>
<th>Statement</th>
</tr>
</thead>
<tbody>
<tr>
<td>House &amp; Infrastructure</td>
<td>Improve house</td>
</tr>
<tr>
<td></td>
<td>Improve infrastructure</td>
</tr>
<tr>
<td>Process</td>
<td>Improve process schedule</td>
</tr>
<tr>
<td></td>
<td>Improve distribution</td>
</tr>
<tr>
<td>Location</td>
<td>More money</td>
</tr>
<tr>
<td></td>
<td>Improve location</td>
</tr>
</tbody>
</table>

Table 13: Final clustering of answers to Q23: “Is there anything you would improve in the relocation process?”

(own table based on the questionnaire, 2015)

All of the answers given and the whole clustering can be checked in the annex (cf. Appendix 6.2.2). Although the question emphasised on improvements for the process itself, the majority of answers were linked to the outcomes of the resettlement, as can be seen in Figure 88.
By looking at the results it becomes obvious that the category “House & Infrastructure” takes the first place, covering 70% of all suggested improvements. So we can assume that is when the people got their land certificates, the second thing they are concerned about is their new home and the infrastructure in Mojosongo. This assumption can be proved by two facts: First, the concerning category is the one with the second most percentage in question 22 (c.f. Figure 89). And second the statements “improve house” and “improve infrastructure” are the second most frequently answers given asking about the improvements. Coincidentally they together cover as well 70% like the category they belong to (c.f. Figure 88 and 90).

The process occurs second most frequently within the categories. These answers might concern our research-question directly. It includes the statements “improve process schedule”, “improve distribution [of money]” and “more money”, altogether eight answers were given. This number does not permit a statistical evaluation but gives a very good overview on the assessment of the relocation process. Unfortunately a more precise clarification of the improvements is missing in the answers but we can derive the two most important topics: the process schedule and money.
Lastly, also the location of the new settlement is mentioned as improvable. All three answers given concerning this subject revolve around the topic of green spaces or rather the missing green spaces. Figure 89 gives an overview of all the answers given for possible improvements for the relocation process, including their frequency in relative numbers.

![Figure 90: Starting points to improve the relocation process](own figure based on the questionnaire, 2015)

Despite one fourth of the given answers implying that there is no need for an improvement, we can conclude certain aspects from the other responses as seen in the section before. Furthermore we cannot be sure that all given answers really concern the process itself, because – as mentioned before – there might have been a loss of information during the translation process. Perhaps the relocated people do not have a clear idea between the differences, but surely there is the opportunity to implement these proposals within the improvements of the process.

Nevertheless, the evaluation of this question leads to two conclusions. On the one hand, the new houses and the different kinds of infrastructures are by far the most important topics when talking about possible improvements. This could be implemented for example by providing more money. On the other hand, the schedule of the process should be revised, mainly to shorten it and make it more fluent.

### 4.4.1.3 Conclusions

As a synopsis we can say that more than three quarters of all relocated families are satisfied with the process of the relocation. It was difficult to justify this circumstance by the evaluation of the questionnaire. This is because it might be possible that some interviewed persons misunderstood that the questions being asked aimed strictly on the relocation process, not on the programme or livelihood aspects. Moreover, there is a slight hint that being included in the planning process might have a positive aspect in being satisfied with the process. And furthermore there is no doubt that getting a land certificate, and by this settling legally, is the most important aspect to assess the process as positive and not as suspected, the protection from natural hazards. The high percentage of people being satisfied with the process – more than three quarters - is surprising. Especially because the research team got the perception, by seeing the settlement in Mojosongo, that there is still
a lot of work to do, especially because the people are still exposed to natural hazards in form of landslides. This circumstance is also mentioned in the interview with Dr. Gamal. For future relocation programmes it should be considered that, according to the relocated households, especially the new houses, the infrastructure should be improved. Moreover, the process should be shortened and the distribution and the amount of money should be reconsidered, as well as the location for the new settlement.

4.4.2 The administration’s perspective on relocation

To assess the opinions of different actors in municipal administration regarding the relocation, a qualitative approach was chosen. The research-team selected a guideline approach to reach coordinated information in the end. All in all 15 interviews took place. The group of interviewed people comprised local RWs and RTs, members of the Sebelas Maret University (UNS) of Surakarta and members of the municipal administration of the city of Surakarta, including the Kelurahans. The Pokjas take a special place within “public administration” because they function as an intermediary between the administrative and the local people. The expert interview directory contained a section dealing with the personal perception of the interviewee. Because of the diversity of experts it is possible to get a comprehensive overview of the relocation programme and its execution.

However it must be mentioned in this part as well that, like in the quantitative evaluation, some interviewees might have misunderstood some questions or translation errors occurred.

During the analysis of the interviews, it attracted the attention of the researchers that the interviewees sometimes did not distinguish between the relocation programme and the process. Another explanation might be that they simply do not care about the process. What seems really important to them is the outcome of the programme. But this is not a serious problem at all since many aspects are overlapping. Because of this, the expression “programme” – meaning not only the process of relocation itself but also the planning and results of the act - will be used as well in the analysis.

4.4.2.1 Analysis

The relocation process is read by experts in three different ways: a complete rejection of the process itself, the meaning that the process is good but can or should be improved and the opinion saying the programme is fully developed. These assessments are expressed in the following as negative, positive and medium.

Negative Opinion

According to Dr. Gamal, an expert in urban settlement at the UNS, the relocation programme cannot be labelled as such. In his opinion the resettlement could rather be named as research than an explicit programme. The actual act of relocation had happened by accident while doing an investigation about natural hazards, or more precisely about the disastrous flood in Pucang Sawit in 2007. Furthermore, he explained that in this case we can talk rather about a reactive action as of a well thought out plan. In his mind, these coincidental steps do not result in a proper action. Moreover, according to him, a real programme would need much more planning and investigating.

Positive Opinion

In contrast to Dr. Gamal there is also the judgment of the relocation as an incorrigible programme, which illustrates no problems at all. In addition to this, all affected households support the government during their decision-making. Besides, there was a change in the distribution of the provided money by the government, which made the programme finally inveterate for the moment the interviews took place. Since 2014, the entitled amount of money is distributed directly to the relocated families. Before this year the entire
appropriations were given to the *Pokja* by the government. Afterwards it was his job to share the money among the concerned households. There was no direct response to the reason for this change or the initiator, but the interviewers and the translator came to the conclusion that there must have been corruption among former *Pokjas*. This new measure made the flow of money more transparent (Budi, 2014). Strangely this is the opinion of the *Pokja* of *Puncang Sawit*, the former settlement area. Because of his function as an intermediary between the government and the local people, a *Pokja*’s job is to be very well-informed about the process of relocation and its expiry. So it is very uncommon for such a person to have such an explicit meaning. Furthermore an RT of *Puncang Sawit* shared this opinion of Budi. According to him, “[...] the relocation programme is a very good programme” (RT02Riverbank, 2014). He continued that the programme should be applied in other parts of the city as well. Besides, the community representative of RT 02 mentioned three reasons to substantiate his judgment:

- **The security aspect:**
  The relocated families are no longer affected or have to be afraid of being affected by the flood which occurred regularly in the former settlement area of *Puncang Sawit*. He stated that in *Mojosongo* the people’s sense of security improved.

- **The health issue:**
  Because of the poor quality of the sanitation in their previous community, diseases were a daily problem. Furthermore it was easy to be infected by pathogens.

- **The economic aspect:**
  According to him the prosperity among the people increased comparing to *Puncang Sawit* (RT02Riverbank, 2014).

Two of these aspects are also proven by the relocated household’s perspective on the relocation. “No more flood” and “increased income” are two of the four most commonly-set statements explaining why they assessed the process as satisfactory - compare to Figure 87.

### Medium Opinion

The most conventional assessment about the relocation process is that the programme or process – as already mentioned - is pretty well for now but there are certain aspects that have to be improved for the future. In the following chapter there will be the opinions by the members of local administration at first, followed by an expert in urban planning of the Sebelas Maret University (UNS) and finally members of the municipal administration.

One interviewee, who is living in the neighbouring of the former settlement, answered the question if he and his community would like to be relocated with the response that he “[...] would love to take part [...]” (RT01Riverbank, 2014). This response indicates that he evaluates the process as positive as well. However, he claimed that it would be only possible if they get a “fair price” for their houses (RT01Riverbank, 2014). In contrast to this the *Kelurahan* of *Puncang Sawit* explained that people would get jealous if everyone gets a various amount of money. He stated in order to avoid conflicts beneath the people everyone gets the same sum regardless the size of the house or the family differs (Seifi, 2014).

A similar opinion has the RT 03 of RW 06. According to him, the programme was good but still has to be improved. He particularly highlighted the land certificate as a very important factor because previously the families only owned the houses they live in but were legally not allowed to settle in *Puncang Sawit*. The importance of the certificate is pointed out in the interview with Dr. Gamal as well. The member of the UNS pointed out that the families are now able to get a loan from a bank if they need one. This was not possible before because they did not fulfil the prerequisite of the land certificate (Gamal, 2014). The head of the community of RT 03 RW 06 further explained that he and his community would like to be relocated as well if they would have the possibility. Additionally, he mentioned that he is
concerned about the situation of his neighbourhood. Too many people are living on too little ground. Moreover their houses are in a bad shape. These circumstances lead to bad conditions, especially for their children. As examples, he detailed their health condition and education, which are particularly affected in a negative way (RT03RW06, Solo Local Expert interview RT03 RW06, 2014). In contrast to this statement, regarding the infrastructure, it is the opinion of RT 02 that the relocation as incurable. He used the following analogy to illustrate his point of view: “When we are having a plate of meal and the plate is divided into two, of course what we have is not enough” (RT02Riverbank, 2014). The interviewee wanted to clarify by this that now, when half of the population has moved to another place, what is left for the remaining people is not enough. You can get an impression of the remaining settlement in Figure 91. Returning to the community representative of RT 03 RW 06, he elaborated on the preferences for the resettled families. In his opinion, their life improved with the relocation. However he mentioned that the location of Mojosongo also has a negative aspect. The costs for transportation have now increased and in addition the connection for traffic got worse, especially to reach shops for their daily needs. To improve the relocation process, he named the distribution of the land certificates because not all families got them yet. This circumstance has already been mentioned by the relocated people as well. In addition he referred to the unequal distribution of the entitled money, arguing that some people did not get the full amount. He claimed that some people, probably a member of the Pokja or he himself, misappropriate money that would have been granted to the relocated families. This case of corruption or embezzlement has also been mentioned lightly by the current Pokja of Pucang Sawit (Budi, 2014). However this case has not been mentioned straight in the interviews so we can only guess about that.

Figure 91: Remaining settlement in Pucang Sawit with dyke on the right hand side (Own figure, 2014)
Another member of the Sebelas Maret University (UNS), who has been interviewed, is Winny Astuti M.Sc., Ph.D., an expert in urban and regional planning as well as in human settlements development. In contrast to Dr. Gamal, she had not such a bad experience with the relocation process. According to her, the concept of the resettlement is generally good. Mrs. Astutim particularly noted that thanks to the programme, the relocated families’ situation, in relation to natural disasters, has improved quite a lot. Nevertheless, there are still many necessary improvements for future relocations. First of all, she talked about the linking of the different involved institutions in the relocation process. There are two aspects that should be corrected. First, the education of the affected households and the competent institutions in terms of regulations should be corrected. According to her, there was a lack of knowledge concerning the established rules for settlement and urban planning in both parties. As an example, she mentioned that the people who were living on the riverbank in Pucang Sawit did not know that they were living illegally on restricted ground. Moreover, if the administrative institutions were clearer on spatial planning, the preparation for the relocation process could be enhanced quite a lot, especially in terms of legal requirements to make the planning process faster and more fluid. Second, the communication and collaboration between the different parties should be improved. In her mind the different levels of planning should be better linked together to avoid discrepancies. Furthermore, fewer people would be disappointed or irritated if they do not get what they expected because of misunderstandings or missing agreements. These two aspects would bring advances in time and transparency (Winny, 2014).

Another interview took place at the Office for Land Title Authorities with Pah Sryono. In his statement he explained that in his mind the programme is sufficient for now, especially in terms of organisation and structuring. Additionally, he declared that the programme has already been incorporated in urban planning strategies. He however explained that now it is the turn of the city government of Surakarta to evaluate all the data they collected during the monitoring of the relocation process.

Figure 92: Interview at the Office for Land Title Authorities
(own figure, 2014)
Unfortunately Pah Sryono could not specify any detailed information about the available data, who collected it or for which concrete urban planning strategies the programme has been incorporated. Furthermore he detailed that the better they understand and handle the data, the more exact can improvements be made for future resettlements, so an ongoing monitoring could help even more. Moreover, he said that he is wondering that there are so less conflicts. At this point there is a contradiction between him and the other interviewees. As we have seen before, many households claimed that they did not get their certificate yet. This statement was affirmed by the chief of the community of RT 03 RW 06 as well. For a family there is no difference between waiting for a certificate which is stuck in any official procedures, waiting for an applied certificate or not having one. In contrast to this Sryono announced that “[i]n this area [...] everything is clear with the certificate, they all have it” (Sryono, 2014). There seems to be a lack of information here between the different levels and involved groups, which needs to be filled up urgently.

Another interviewee of the municipal administration of the city of Surakarta is Pak Sukendar, a member of the City Council. According to him, it was a lasting process, and it took more than three years until the programme could take place. As a reason he mentioned the preparation of the relocation itself and the persuasion of the people. So we can suspect that many families were sceptical about the resettlement at first, otherwise it would not have lasted that long to persuade them. This sceptical attitude towards the programme or process is verified by Sukendar in the ongoing interview. He admitted that some parts, unfortunately he is not more specific as to which ones, are not mellow yet. So in other words, he confesses that there are still things to improve but he is optimistic. However, in addition, he added ad- and disadvantages for the relocated families. In this case, he mentioned, like the other interviewees before him, the land certificate as the most crucial argument. As a possible negative effect, Sukendar told us that there might people who already had their certificates and now have to accept that within the resettlement, the condition or quality of their houses might have gotten worse (Sukendar, 2014). This circumstance, that some people might have had their certificates already before the relocation, was however mentioned the first time. So there is no other evidence to prove this statement. Furthermore he added that in his opinion especially the process at the office for land administration – or in other words the selection and purchase of new settlement ground - should be improved by simplifying it. This action is needed to tighten the procedure. Moreover, according to him, the longer it takes until the people get their certificates, the more difficult it will be to find acceptable and affordable land for them. He mentioned that today the land prices are rising very quickly, so the more time that goes by, the more complicated it will be to find a new settlement area with a modest price. Besides this, the provided amount of money by the government is not rising at the same time. As a result, it is necessary to fasten the process itself to have more opportunities, for example by simplifying the approving of money in the different administrative levels. In summary, our interviewees named 6 possible improvements of the relocation process:

1. Improve distribution of land certificates
2. More transparency by the distribution of money
3. Making the planning process more collaboratively
4. Continuously monitoring of the process
5. Monitoring of the settlement after the process
6. Shorten the administration processes to simplify and fasten the whole relocation process

4.4.2.2 Conclusions
It is obvious that the main assessment by the interviewed members of the municipal administration is a positive one. However nearly everyone can name aspects or parts of the
process which should be improved to achieve the predetermined goals of a successful relocation like the protection from natural hazards or the improvement of living conditions. As a synthesis we can name the following aspects: First of all, there is the need to know all necessary rules and restrictions. If every involved person is enlightened straight from the beginning about the possible and impossible options for the resettlement much time and discussions or frustrations can be saved. The second thing is the preparation. All important arrangements for the programme have to be completed before the process starts running. Otherwise there might be delays which can be expensive or even make future steps impossible. As an example the provided money from the government for the new settlement area can be mentioned. Because the land price in the city is rising fast in Surakarta, no time can be wasted to acquire the ground that is conceded to the people (Frank, 2014). Finally there is need for a continuous monitoring during the process and also especially afterwards. This supervision enables the improvement and adaption of the programme during the process itself and for future ones as well. Or, to quote a member of the Office for Land Title Authorities: “They have to read and understand the files, the data, they have to understand the data very well, so in the future they have to learn from the past, they can make decision[s] that are correct and proper.”

4.4.3 Comparing the perspectives of experts and resettlers on the relocation process

Not all interviews which took place in the city of Surakarta were used for the assessment of the relocation process because some did not answer to the research question. This could have been avoided by designing the interview guideline more directly to the research question or the determined categories of MAXQDA. To compare the results of the evaluation of the members of the municipal administrative and the relocated families a short critical evaluation of the interviews is needed. The result of this can be seen in Table 14.

The mentioned interview with the Kelurahan Sefli was not considered because no assessment of the relocation process could be pointed out. This assessment of the different interviewees was used to determine a quantitative value which helps to compare the assessment of the relocation process by the relocated families and members of municipal administration.

<table>
<thead>
<tr>
<th>Interview</th>
<th>Statement</th>
</tr>
</thead>
<tbody>
<tr>
<td>RT 01 Riverbank</td>
<td>+</td>
</tr>
<tr>
<td>RT 03 RW 06</td>
<td>+</td>
</tr>
<tr>
<td>Dr Gamal</td>
<td>-</td>
</tr>
<tr>
<td>Winny Ph.D.</td>
<td>+</td>
</tr>
<tr>
<td>Pokja, Budi</td>
<td>++</td>
</tr>
<tr>
<td>Land Title Office, Sryono</td>
<td>+</td>
</tr>
<tr>
<td>City Council, Sukendar</td>
<td>+</td>
</tr>
</tbody>
</table>

− very negative   ++ very positive   + positive assessment

Table 14: Perspectives of experts and resettlers on the relocation process (own table based on the questionnaire, 2015)
If strict positive and positive assessments suggesting improvements are added up, we come to the conclusion that more than 85% of all interviewed persons assess the relocation process as a success. In comparison to the assessment of the affected households in which about three quarters evaluated the process as a success – the values of Figure 84 are rounded ones – we see an even more positive judgment of the experts. So, all in all we have an arithmetic mean of a positive assessment of the relocation process of more than 80%, compared to Figure 93.

![Figure 93: Assessment of the relocation process by relocated families and local experts](own figure based on the questionnaire, 2015)

We have seen that the relocation process in Surakarta proceeded smoothly in large parts, in the opinion of both, relocated families and experts. The main aspects for a successful relocation project for the resettled families are firstly governmental or status attitudes, secondly their new house and the infrastructure of the new settlement area and thirdly the protection against natural hazards. Or to be more precisely: to get a land certificate and to be protected from floods. Compared to the aims of the relocation programme, we can say that the main ones have been achieved.

Nevertheless there is still need for improvements, especially in terms of a fair distribution of the money available for new houses and infrastructure. 70% of the relocated people claim these actions as the most important ones. Because these suggestions do not fit clearly to the actual process of relocation – rather to the relocation programme - we can assume that material or livelihood aspects are more important issues for the questioned families like different administrative processes of which they –possibly - do not know. Moreover getting the promised land certificates plays as well a superior role. We will get to know how many doors of opportunities can be opened by settling legally. But the most important thing to do is the monitoring. It is very essential that during and especially after the process all the different tasks, like how long did the different applications take or which issues made the process protracted, are controlled and evaluated by a team which should be independent from the different included parties. An evaluation, which could be used several times, could be performed by standardised questionnaires, for example. Probably a predetermined to-do-list would bring the best results for improving the programme and the process as well for
future resettlements. Finally, one can assume that the results of the research can already be seen as satisfactory but there is potential to be improved. Especially asking about the process of relocation should be given more emphases, to avoid misunderstandings.

4.4.4 Methodological reflections

Because of this result, one might think of how to improve the methods used. By doing an interview or asking people with questionnaires, it is possible to mix up the exact meaning of the expressions programme and process. Perhaps using expressions which are easier to understand for people who are not familiar with the scientific term might solve this problem. Or simply to explain properly what information you want to get, at best already directed to the categories chosen for MAXQDA. Furthermore, when doing research in a different language it should be considered not to lose any information during the translation process. Because of this, the correct choice of the interpreter is very important. Beyond every interview has to be recorded, to have a back-up if anything is unclear in the process of the evaluation.

4.5 Impacts of relocation on local livelihoods in Pucang Sawit

In contrast to the first research question, the aim of this research question and chapter is not to assess the impacts of the relocation on the people’s livelihoods in Mojosongo, but in the “old area” of Pucang Sawit. The meaning “old area” derives from the idea that the resettled people who now live in Mojosongo, used to live in the “old area” in Pucang Sawit (see the difference in Figure 94 and 95). And this area, which is now transformed into a park, is still surrounded by many communities (RWs RTs). The goal of this research question is to evaluate the livelihoods in these RWs RTs and the changes due to the resettlement and the reconstruction of the riverbank into a public park. The difference between this research question and the others is the approach towards the resettlement, because the resettlement only indirectly affects the people who still live in Pucang Sawit. These people were not part of the relocation programme in Surakarta; however their livelihoods changed indirectly due to impacts coming from the resettlement.

4.5.1 The “old site” in Pucang Sawit

The newly built park in Pucang Sawit, located in the area where the resettled people used to live, affects the neighbouring people and communities in different ways. Prior to the resettlement, the riverbank was densely populated with around 100 additional households. These houses were illegal because the law says that you are not allowed to settle on a riverbank. However the people still settled there and some still live on the riverbank. Figure 94 and 95 show the changes of the riverbank in Pucang Sawit from the year 2006 to the year 2013.
You can clearly see how the riverbank turned from a densely populated area (Figure 94) into a park (c.f. Figure 95). The dam creates a clear border between the park and the residential area in the north (see the utilisation map in Figure 96. The neighbouring RT in the west is still located on the riverbank due to different land rights received by the Sultan decades ago. According to the Riverbank RT, they used to live on the riverbank even before the dam was built under the Suharto administration.
4.5.2 The newly built park in Pucang Sawit

After the devastating flood in 2007 where the whole riverbank and the neighbouring RWs RTs were flooded (these RWs RTs are situated behind the newly built dam) it took three years until all people living in the informal settlement were resettled from the riverbank. During that period the park was built bit-by-bit until it was completely finished in 2011. The park has many different facilities as you can see in Figure 96.

In addition to many meeting points to sit down, there is a playground for children as well as a motocross parkour for motorbike rider. In the north, the park is bounded by a high dam, which was heightened after the 2007 flood. To the west the park is bordered by the still remaining settlement on the riverbank. And to the east the park has a smooth transition into mango fields turning to the north following the bank of the meandering river.

![Figure 96: Land use of Pucang Sawit riverbank](own figure, 2015; aerial image: Google Earth & DigitalGlobe, 2014)

4.5.3 Analysis approach

To assess what impacts the relocation had on the livelihoods of neighbouring RWs RTs in Pucang Sawit, the impacts influencing the assets of the sustainable livelihoods framework will be evaluated. Some outcomes of the relocation impact several assets at the same time, thus often no direct link between a cause and its effect on a single livelihood asset can be determined. Figure 97 shows the process of the analysis. Each asset will be analysed individually to show how each capital influences the changes in the people’s livelihoods. In the end all capitals will be summarised and assessed to see the changes and understand the impacts. So if one impact/change directly has an effect on one capital it is the functional chain A. If one impact/change affects two or more capitals at one time it will be handled like the functional chain B. And functional chain C will occur if one impact/change will only happen if another impact/change has occurred before. Therefore, one impact/change requires circumstances coming from a prior change (c.f. Figure 97).
4.5.4 Evaluation of data

The collected data will be evaluated by using the sustainable livelihood framework (DFID, 1999), already mentioned in chapter 4.3.1.3. The background to this framework was already explained in research question one. In the next chapters 4.3.2 to 4.3.2.3 Impacts on different capitals (physical, financial, natural, human and social) will be elaborated.

4.5.4.1 Impact on physical capital

The first capital, which will be dealt with, is the physical capital. It is relatively easy to evaluate if the physical capital has changed. This is because most changes influencing the physical capital are tangible, for example, modifications of infrastructure or changes in the physical environment like better sewage system or improvement in electric lighting. These changes will also have a subsequent effect on other capitals of the people’s livelihoods. The main changes were the heightening of the dam, newly built public toilets, a new fresh water supply, a newly installed early warning system, a new waste management and the construction of the newly built park.

First of all, a distinction between the statements of the RT still living on the riverbank, and the other interviewees (RTs, administrative level, university) has to be made. They have a different perception towards the relocation then the RT still living on the riverbank does because of the location on the riverbank, as this RT is still affected by flooding. The people still living in this RT also have a negative attitude towards the relocation because the benefit promised from the government are the reception of a land certificate and money to buy new land and reconstruct their houses. However the people still living on the riverbank do have a land certificate already and will not be satisfied with getting the same amount of money and the same compensations as the people who also get a land certificate. As they mentioned, they would also be happy to be relocated. This point will be discussed later in the conclusion.

In addition, the access to their RT became worse for the people living on the riverbank. To protect the settlements behind the dam from flooding, the dam was heightened over the years. So now it is harder to access the area behind the dam. That means that, on the one
hand, the improvement of the dam has a positive outcome for the people behind the dam, because they are secure from flooding. On the other hand, people still living on the riverbank have to deal with a further reduced accessibility of their homes (due to the enhanced dam) and floods. This shows how one change in the physical capital can have two quite contrary outcomes on the livelihoods of the people. A second example of a divergent view is the street lighting in the area. The people on the riverbank complain about it, because the government simply removed the streetlights (RT01 Riverbank, 2014). That led to a deterioration of the lighting and the quality of the lights because there are fewer lights and the light is now dimmer. The quality of the lights might also come from a reduced power supply, because the city government is not willing to supply illegally settled areas with good electricity. Therefore, they might try to motivate the people to move to another area. In contrast, it could also be backed up by the fact that the Pokja of Pucang Sawit talked about an improvement of the lighting and the electricity supply in general, as the same volume of power supply has to be shared among fewer people (Budi, 2014). Only the people living behind the dam benefit from an improved power supply. This leads to the assumption that the government is not happy with people living on the riverbank. Noticeably you can see in this example that one impact/change can have a positive effect on the capital for some people, where for other people it will have a negative impact on their social capital because it is harder for them to go out of their RT. But not all intended improvements of the physical capital showed this ambiguous character. In fields of basic sanitation, sewage system, waste management and fresh water supply an overall positive development can be deduced. Next to newly built public toilets and a new established waste management, the PDAM, Perusahaan Daerah Air Minum (Indonesian regional water utility company) also improved the fresh water supply. In addition to this the government built a water pump to help pumping water back into the river in case of a flood event, if the dam is not sufficient against the flood. All of these new facilities have a positive impact on the physical capital as well as on the living conditions of the people. This is not only because of the improved infrastructure but also due to the fact, that all of these facilities have to be shared amongst a smaller amount of people. The assumption is made that this will lead to comparably less water pollution, less waste production and maybe also cleaner public sanitation facilities. Then again, concerning the waste issue, the park was full of waste burning places, as you can see in Figure 96 in the utilisation map and in Figure 98 at a closer look. This is the opposite of the “improved waste management” reported by the interviewees and evidence that the waste disposal did not improve, but they burn the waste further away from their houses. Consequently, the waste burning issues then again influence the people’s health.

This shows a connection to the human capital, which includes health issues. The reason why the people told in the interviews about an improved waste management is the fact that they can burn their waste in the newly built park and not in their backyard anymore. This might lead to a different perception and therefore they feel an improvement in the waste management.

Another change in the physical capital, which has a direct connection to the human capital, is the newly built early warning system, as you can see in Figure 99. The installation itself is positively connected to the physical capital, however without any instructions and tutorials the people might not interpret it the right way. The fact that not one of the interviewees mentioned the early warning system as a new installation shows that they are not familiar with its necessity. However the city council mentioned that there will be a “training for the early warning system” (Sukendar, 2014). Here you can see a positive change in the physical capital, only becoming effective if the people get education, which then leads to an improvement of the human capital.
Nevertheless, the biggest change, which affects the physical capital, is the recently built park. This park gives the people living in the surrounding area many possibilities for usage but also attracts people from outside to go there. Additionally, with the construction of the park, the
waterfront was strengthened and now protects the riverbank from abridgement due to a fortification of the bank as you can see in Figure 100 on the left side. Since the park is an open space, the government can now use bulldozers to shovel the sediments back into the river after the riverbank is flooded. The use of this big machinery was not possible when people used to live on the riverbank. It was much harder to bring the sediment back into the river. The people had to do it with smaller and more insufficient tools. Looking ahead, regarding the physical capital, there is a plan to build a river port close to the park to generate river tourism in this area. This tourism could be a good source of income for the people in Pucang Sawit. The living standard could improve and therefore the human capital could have a positive development. With respect to the plans, it seemed that the people are not really aware what is going to happen regarding the waterpark. It is more like a dream of the future. Furthermore, the feasibility of the waterpark seems unrealistic and it requires much more planning until the people can benefit from a waterpark.

Figure 100: The riverbank of Pucang Sawit during Perahu Gethek Bengawan festival (Atmo Gandul, 2014)

In conclusion, it is not definite that all the changes, regarding the physical capital, in the area of Pucang Sawit resulted from the relocation. Some constructions, like the heightening of the dam or the new early warning system were probably built as a result of the relocation. The improvement in water supply, sanitation systems and waste management might have been implemented without the event of the relocation. However, the government is happy that the flood prone area on the riverbank is now a park so the amount of people prone to flood events decreased. Nevertheless, even though the RT on the Riverbank complained about bad lighting and harder access to their settlement, the relocation had a positive impact on the physical capital of the sustainable livelihood framework of the neighbouring RWs RTs because all the new facilities and constructions are helpful and more up-to-date (RT01 Riverbank, 2014). Table 15 and Figure 101 show the relations and changes of the physical capital and gives a quick summary.
<table>
<thead>
<tr>
<th>Changes</th>
<th>RWs RTs behind the Dam</th>
<th>Riverbank RT</th>
</tr>
</thead>
<tbody>
<tr>
<td>Heightening of the dam</td>
<td>+</td>
<td>-</td>
</tr>
<tr>
<td>Street lighting</td>
<td>~</td>
<td>-</td>
</tr>
<tr>
<td>Public toilet</td>
<td>+</td>
<td>+</td>
</tr>
<tr>
<td>Waste management</td>
<td>+</td>
<td>+</td>
</tr>
<tr>
<td>Fresh water supply</td>
<td>+</td>
<td>+</td>
</tr>
<tr>
<td>Early warning system</td>
<td>+</td>
<td>+</td>
</tr>
<tr>
<td>Newly built park</td>
<td>+</td>
<td>+</td>
</tr>
</tbody>
</table>

“+” positive  “-” negative  “~” indifferent effects

Table 15: Positive, indifferent and negative effects on physical capital (own table, 2015)

Figure 101: The chain of effects regarding physical capital (own figure based on interpretations, 2015)
4.5.4.2 Impact on financial capital

The financial capital is influenced by the amount of savings, the possibility to get credits and the potential for newly-generated income. Due to the retentive attitude of the Indonesian people it was very hard to get information about their savings or their financial situation. However, it is possible to analyse the changes of the financial capital by considering the new potential of income in the area and how the people can benefit from it. There are three main income sources which came up resulting from the relocation. These are a mango plantation and cultivation of herbs, the maintenance of the park and the future plan of a river port and water tourism connected to that.

The first one is resulting from the government’s plan to help the people improve their income by selling fruits from the plantation at the riverbank (c.f. Figure 96 in the utilisation map and Figure 102). The government installed this plantation in favour of the local people. Especially the mango trees could be used, first to feed the neighbouring RWs RTs and also for the people living in the surrounding area of the plantation to sell the fruits. The planting of the mango trees also directly influences the natural capital. Unfortunately, however, there is a lack of maintenance of the mango field because the people of the surrounding RWs RTs do not feel integrated and not taken into account in the relocation process. This might lead to lower crop yields in the future. So the people will not benefit from the plantation of mangos as long as they do not look after the trees. The plan, mentioned by the Kelurahan of Pucang Sawit, to plant herbs for the people to use and sell them in the future is not going to work out, if there is no rethinking of the attitude towards the new park and the mango/herb fields (Selfi, 2014). However the maintenance of the plantation should be in the people’s own interest because they could benefit from it.

Another point regarding possible income is the maintenance of the park. There is an institution in Surakarta maintaining all the green spaces in the city. Incomprehensibly the
government is theoretically responsible for taking care of the park, but wants the neighbouring people to take care of the plantation voluntarily. That might be the reason why the people do not feel integrated in the process. If the government would pay people from the neighbouring RW’s RTs to maintain the park, there may be greater satisfaction and the financial capital would have a positive development because people from Pucang Sawit could earn money due to the park.

The second subject that might influence the people’s income is a future plan by the government. There is the already mentioned river port, to generate income for the local people. Where the river port is going to be situated was not able to be figure out. A new water park and the possibility to take part in water sport activities could attract tourists. The people from Pucang Sawit can work as guides, skippers or sell locally produced souvenirs. Many people could therefore benefit from an improved tourist industry. One main problem will however still be the pollution of the Bengawa Solo River. It is very likely that hardly any foreign tourist would make use of this water tourism due to the low water quality. This shows the plan to generate money from tourism is good but also not very thoughtful. Because of the little experience in the tourist industry the people’s expectations towards the water tourism might not be met. There is a potential in this area to improve the financial capital but it will be hard to exploit it. Table 16 and Figure 103 sum it all up and show the different connections between the capitals with a closer look at the financial capital.

<table>
<thead>
<tr>
<th>Changes:</th>
<th>Surrounding RWs RTs</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mango plantation/cultivation of herbs</td>
<td>+</td>
</tr>
<tr>
<td>Maintenance of the park</td>
<td>+</td>
</tr>
<tr>
<td>Water tourism</td>
<td>+</td>
</tr>
</tbody>
</table>

Table 16: Positive effects on financial capital (own table, 2015)

![Figure 103: The chain of effects regarding financial capital (own figure based on interpretations, 2015)](image-url)
4.5.4.3 Impact on natural capital

The natural capital of the neighbouring RWs RTs has changed a lot after the relocation. There are five main changes, which came up affecting the natural capital. These are the creation of the park and the green spaces, the mango field and the cultivation of herbs, the newly built facilities like public toilet and a new sewage system, the waste burning issue and the storage of waste oil in the area.

The construction of the new park is an attempt to create a natural environment at the riverbank and to bring back the function of the riverbank as a floodplain during flood events. As the park is labelled as an urban area, with an own urban forest, it is meant to be used by the people for different activities. The greening of the riverbank into a park with a lot of free green space as you can see in Figure 104. An urban forest, meeting points and a children’s playground were integrated into the park (c.f. Figure 96 in the utilisation map). Additionally, to the new regreened area, the roots of the planted trees also support the riverbank so it is more secure towards bank erosion. This again helps to bring back the riverbank’s function as a floodplain. The complaint of the people that there is no maintenance of the park (RT02 Riverbank, 2014; RT03 RW06, 2014; Winny, 2014) derives from an aesthetic background. If the park is not maintained the people start to burn grass in the dry season because they have the idea that it looks nicer and more cultivated if the grass is shortened.

Next to the park there is the mango plantation at the east end of the riverbank (see the east part of the riverbank in Figure 96. These trees increase the density and amount of plants, and therefore positively influence the natural capital. The plan to cultivate herbs at the riverbank would also increase the diversity of the flora. As the Kelurahan of Pucang Sawit mentioned, they are trying to focus on establishing a food estate and to harvest food from the plants in the near future (Selfi, 2014). This brings the connection to the financial capital. If the
maintenance and care taking of the mango field does not improve, the people will not benefit from it. Especially the mango field needs cultivation, otherwise the trees will not be high yield and might die in the end. This would weaken the natural capital in future and connected with that the financial capital because no profit can be made from the harvested herbs or fruits.

The third point influencing the natural capital is connected to the changes in the physical capital. The renewal and improvement of sanitation and infrastructure indirectly helps the nature to recover. Especially new public toilets connected to the sewerage network lead to an improved sewage treatment instead of disposing sewage into the river. There is still no guarantee that the faeces coming from the new public toilet do not end up in the river, but new public toilets could be the starting point for a more environmental friendly future. Connected to that Kelurahan Selfi mentioned that “the people started to change their behaviour of waste disposal” (Selfi, 2014). This also shows a new perception towards the waste issue. Next to the waste disposal and the new public toilets, the renewed sewage system improves the natural capital. Now less sewage is disposed into the river but is disposed into the city’s sewage system. This leads to fewer diseases and better health, which will then again influence the human capital and shows an interaction between the natural and human capital.

The fourth main point, which affects the natural capital, is very indistinct. Some RWs RTs mentioned better waste disposal and an improved waste management in the area as mentioned in the chapter on physical capital (RT02 Riverbank, 2014; RT03 RW06, 2014). This is because less people in the area produce less waste, which should lead to a cleaner area. In addition to that, the Kelurahan of Pucang Sawit talked about the cleanliness of the park and the change of behaviour towards the waste disposal (Selfi, 2014). This would lead to a healthier natural environment and would improve the natural capital. All of these statements are right, however they have to get critically scrutinised. Even though the interviewees mentioned better waste disposal, none of them mentioned waste burning. And as you can see in Figure 96 in the utilisation map and Figure 98 waste burning is definitely happening in the newly built park. Although the mapping was not done over a longer time series, it is very likely that waste is burned in different spots of the park throughout the year. In our mapping more than ten waste burning spots were identified. This affects the natural capital negatively due to the induced air, soil and water pollution. It is likely that in the people’s opinion waste burning is a good way of waste management, as it is practised all over the city. And they might also burn less waste than before so they see an improvement in terms of waste management. However waste burning has a negative effect on the natural environment and therefore on the natural capital. This is the same with debris burning in the area. If the people have building rubble they dispose of it by burning it. This will again weaken the natural environment and the people’s health because when burning debris, the people use spirits and igniter which will release harmful substances when burned.

The last striking features influencing the natural capital are two waste oil storages in the RT on the riverbank. The local community people mentioned that they earn money from waste oil recycling. This is however very questionable because it did not seem to be an efficient and environmentally friendly recycling system – if there is any system at all. Even after asking for the recycling procedure the people could hardly give an explanation about the recycling procedure. This leads to the assumption that the disposal of these oil barrels is probably illegal and not ecologically friendly. As you can see Figure 105 the surrounding soil and ground water body will also get contaminated. Table 17 and Figure 106 show the different effects on the natural capital again. It is striking how many effects on the natural capital require an impact/change made before.
Figure 105: Waste oil storage on the Pucang Sawit riverbank (own figure, 2014)

<table>
<thead>
<tr>
<th>Changes:</th>
<th>Surrounding RWs RTs</th>
</tr>
</thead>
<tbody>
<tr>
<td>New facilities (Sewage system, public toilets, fresh water supply)</td>
<td>+</td>
</tr>
<tr>
<td>Waste management</td>
<td>+/-</td>
</tr>
<tr>
<td>Mango plantation/cultivation of herbs</td>
<td>+</td>
</tr>
<tr>
<td>Maintenance of the park</td>
<td>+</td>
</tr>
<tr>
<td>Waste oil storage</td>
<td>-</td>
</tr>
</tbody>
</table>

“+” positive  “-” negative  “~” indifferent effects

Table 17: Positive and negative effects on natural capital (own table, 2015)
4.5.4.4 Impact on human capital

Changes in the human capital imply “skills, knowledge, ability to labour and good health” (DFID, Sustainable Livelihoods Guidance Sheets. Department for International Development, 1999). Especially better health conditions and education towards flood risk reduction were noticed in the area and also mentioned by the interviewed people (RT02 Riverbank, 2014; Sukendar, 2014).

The health status is directly connected to food security and income generation. Food security of the people in the neighbouring RWs RTs of the riverbank should improve with the mango trees planted by the government, although this can only be a quite limited contribution. As the people of Pucang Sawit should maintain the mango field, they should also utilise the mango fruits. This would give free mango fruits to the people which they could eat for free. This would support the people’s nutrition and save them money. But as long as there is no
maintenance of the plantation by the local people, they will not benefit from it, neither in a financial nor in a nutritious way. The same could also happen to the government’s plan to plant herbs for the people. If the maintenance problem is not solved, no one will benefit. However if the local people will care for the mango plantation, they could optimise the harvest and improve their food supply and save money by doing so. They can eat the fruits and have a more balanced diet, or they sell the fruits and can afford other kind of food. Especially children’s growth benefits from a balanced diet with a variation of vitamins coming from fruits like mango.

This could reduce the cases of illness together with the better freshwater supply mentioned in the physical capital. Cleaner water will lead to better hygiene. Also, the change in the waste management connected to less waste burning could improve the people’s health. Together with that, the waste oil storage is also affecting the people’s health and has a negative effect on their human capital. Another factor, which also reduced the amount of ill people and diseases, is the relocation of the riverbank-situated people to Mojosongo. Since there is a reduction of the settlement density due to the relocation, fewer diseases appear in the area of Pucang Sawit (RT02 Riverbank, 2014).

Next to the improvement in health, the education and training towards natural hazards might change in future. This education focuses on disaster risk preparedness training and the explanation of the newly installed early warning system. A RT in Pucang Sawit mentioned there will be “natural disaster training but not ready because people capacity” (RT03 RW06, 2014). The people will be taught how to behave in the case of a flood event. However, this early warning system training is not ready yet and will need more time until it can be taught to the people. If this training is implemented it will again have an influence on the health issue because diseases spread more easily during floods. The natural disaster training might also change the people’s attitude towards natural disasters and will help to better cope with them in the future. The human capital will have a positive change if the natural disaster training will happen in the future and if the people start maintaining the mango field. These assumptions are shown again and summarised in Table 18 and Figure 107.

<table>
<thead>
<tr>
<th>Changes:</th>
<th>Surrounding RWs RTs</th>
</tr>
</thead>
<tbody>
<tr>
<td>New facilities (Sewage system, public toilets, fresh water supply)</td>
<td>+</td>
</tr>
<tr>
<td>Waste management</td>
<td>+/-</td>
</tr>
<tr>
<td>Early warning system</td>
<td>+</td>
</tr>
<tr>
<td>Mango plantation/cultivation of herbs</td>
<td>+</td>
</tr>
<tr>
<td>Less people due to the relocation</td>
<td>+</td>
</tr>
<tr>
<td>Waste oil storage</td>
<td>-</td>
</tr>
</tbody>
</table>

“+” positive “-” negative “~” indifferent effects

Table 18: Positive and negative effects on human capital
(own table, 2015)
4.5.4.5 Impact on social capital

Social capital targets a cohesive and supportive social environment and its changes. The main area that influences the social capital is the newly built park in Pucang Sawit. Changes can derive from the use of the park, the attitude towards the parks as well as the social aspects concerning the park.

The park in Pucang Sawit has great potential for the social capital. The people can meet there and get together or use it as a venue for events. The interviewees mentioned different kinds of use. Some said, that they never use the park and they do not know anything about the park (RT01 Riverbank, 2014). This shows the lack of awareness of the people concerning the resettlement and the new construction of the riverbank. This also connects to the bad maintenance of the park and leads to the sometimes ignorant attitude of the people. Some people feel offended because they were not integrated in the planning process and therefore have a negative attitude towards the park. So this potential remains almost untapped. It is mainly children, especially the kindergarten, using the park to play around. In addition, there is a motocross-parkour in the park to ride motorbikes used by the local people, as well as a fitness parkour, which can be used for working out. The fact that the motocross-parkour was used by local people while the mapping of the park was done, shows that at least some
people use the facilities offered and the potential of the park. This is a positive impact on the social capital of the people even though some people ignore the park.

In contrast to the positive use, the people also mentioned activities in the park which to them are illegal or abusive. Mainly teenagers meet each other in the park in the evening to drink alcohol or “do adultery stuff “ (RT01Riverbank, 2014). In the people’s opinion, teenagers drinking alcohol is a criminal act, and the same is true for teenagers having their first sexual experiences. Beside the statements from the interviews you could also see vandalism coming from teenagers in the park as you can see in Figure 108. There is therefore a different view on the social capital regarding the changes for teenagers and adults/and or community leaders. Resulting from that there is an installation of a neighbourhood watch, which patrols in the evening to stop the teenagers from misusing the park because, according to a RT of Pucang Sawit, the police is doing nothing (RT03 RW06, 2014). This might stop the teenagers to meet in the park and will again influence the social capital.

Figure 108: Vandalised meeting point in the Pucang Sawit riverside park
(own figure, 2014)
The neighbourhood watch will also have an impact on the criminality rate in the area of the riverbank. Before the resettlement many strangers settled on the riverbank and the criminality rate rose according to the RT still living on the riverbank. The community was motley so the people did not know each other very well. Since there are 100 fewer households now, only people who used to live in Pucang Sawit remain. As a result the people have started to trust each other again and the criminality rate has dropped according to the riverbank RT (RT01 Riverbank, 2014). The new neighbourhood watch now keeps order in the area of the riverbank. This is a positive development and leads to positive social capital. However it is questionable if these statements are true. According to Winni, there is “no patrol in the evening” and that is “always the problem” (Winny, 2014). And if there would be a decent neighbourhood watch, all the problems coming with teenagers could be prevented.

With regard to the financial capital, the area can be used for events and tourism. As you can see in Figure 100 the park has been used for events like the Perahu Gethek Bengawan Solo festival since 2012. These festivals will lead to a positive mood in the area and gives the people the chance to meet locals and other people from Surakarta. This will expand the people’s horizons and potentially improve the social networks and cohesion of the community. There are also plans to celebrate Independence Day at the park as well as using the park for local concerts (RT02 Riverbank, 2014). One RT said that these plans are good but there is a lack of managing skills and financial backup (RT03 RW06, 2014). If there would be an improvement in managing these events the people could benefit from it and therefore their social capital could positively change.

The last point investigated, influencing the social capital, is the fact that, even though strangers settled on the riverbank, the community in Pucang Sawit was torn apart by the resettlement. The people who live in Mojosongo now used to live together with the people in Pucang Sawit. They are now separated, which has led to a loss of contact between the two groups. Many people in Pucang Sawit are sad and still remember the sweet memories with their former friends (Selfi, 2014). This separation weakened the community because many people lost their friends and networks broke up. Some of the relocated people might have had special skills like primary care or handicraft skills, which helped the community. This diversity got lost and has therefore a negative impact on the social capital. As you can see, some facts are divergent and have a positive and negative impact on the social capital. Fewer people leads potentially to less criminality, however they also used to be friends of the neighbouring RWs RTs, which leads to sadness in the community. Table 19 and Figure 109 give again a short overview of the changes regarding the social capital.

<table>
<thead>
<tr>
<th>Changes:</th>
<th>Surrounding RWs RTs</th>
</tr>
</thead>
<tbody>
<tr>
<td>Use of the park</td>
<td>+/-</td>
</tr>
<tr>
<td>Drop of criminality rate</td>
<td>+</td>
</tr>
<tr>
<td>Festivals</td>
<td>+</td>
</tr>
<tr>
<td>Separation of the community</td>
<td>-</td>
</tr>
</tbody>
</table>

"+" positive  "-" negative  "+/-" indifferent effects

Table 19: Positive and negative effects on social capital
(own table 2015)
4.5.5 Conclusions

The answer to the question “What impacts did the relocation have on livelihoods of neighbouring RWs RTs in Pucang Sawit?” is very complex and multifaceted. The answer goes far beyond the five capitals of the sustainable livelihood framework, as each capital is again influenced by many different factors, either negative or positive. In addition, some factors can be positive for some people whereas they can be negative for others, as you can see in all tables from chapter 4.5.4.1 to 4.5.4.5. How many of these changes actually derive from the relocation itself is also very unclear. Some things happening or having an impacting on the area would also take place without the relocation, but some changes clearly result from the impacts of the relocation.

The whole range of possibilities influences the physical capital. The heightened dam in Pucang Sawit has a positive impact for the people behind the dam, but makes the access for the people on the riverbank more difficult. The early warning system helps the people to monitor the river. Therefore the dam and early warning system are clearly connected to the relocation whereas the public toilet, sewage system, improved waste management and improvement in fresh water supply were installed regardless of the relocation. However, the government might have invested in these new facilities to upgrade the area of Pucang Sawit. Overall the physical capital has a positive development and therefore improves the people’s livelihoods.

The facts regarding the financial capital will all have a positive impact. However all of these facts can turn into plans for the future and will only take place if there is a change in the
perception of the people regarding the new park. The potential for the people to earn money by selling fruits from the mango field can only be used if there is a change in the attitude towards the park. This attitude should change into a park-friendly attitude and motivate the people to maintain the park and the plantation. Also the plans to generate tourism in the area of the riverbank and earn money from it are plans of the future. If the local people will not start to use the park’s potential they will not have a financial benefit from it therefore the financial capital will not change to positive.

Regarding the natural capital, all positive changes are the result of the relocation. The green space of the park and the higher density of plants, the renaturation of the riverbank and the restored flood retention potentials, the environment-friendly conditions coming from the new facilities and the planting of mango trees only became possible since the relocation occurred. These changes all have a positive impact on the natural capital. The negative impacts on the natural capital happen regardless of the relocation. These facts are waste burning, debris burning and the storage of waste oil. Especially waste burning is very common in Indonesia. Since the new park was built, the people started to burn their waste in the new area. The occurrence of waste burning will happen as long as there is no rethinking regarding waste management. However, now they choose an area of the park to burn their waste where less people are around and will be affected by the toxic gases. This is the same as with the waste oil storages. The people used to have these storages before the relocation and will continue with recycling waste oil if there is, again, no rethinking. Overall the natural capital improved because the already existing negative impacts were there before but the new positive impacts will have a positive development on the natural capital.

The impacts of the relocation on the human capital are all positive. Primarily the change of the people’s health is crucial for the positive change. The use of the mango trees and their fruits to upgrade the people’s diet will better the health as well as the improvement in freshwater supply. Next the relocation of the people made the area less densely populated, which leads to fewer diseases and a decreasing risk of infections. The health will also benefit from this. The second main point influencing the human capital is the newly built early warning system and the trainings and education connected to it. The people will improve their knowledge about natural disasters, especially floods, and know what to do in cases of emergency. So overall the human capital has a positive outcome and the people will benefit from it.

The last capital of the sustainable livelihood framework, the social capital, is influenced by positive and negative factors. The positive facts are the possibility to use the park as a meeting place and get to know other people. This will increase the people’s network and the community will also benefit from it. The second positive fact is the possible reduction in crime. This is a result of the relocation because there are 100 households less living on the riverbank now. And more people can lead to more conflicts and disputes. In addition to that, the new neighbourhood watch helps to keep order in the area. One negative aspect is directly connected to the misuse of the park. Many teenagers meet there in the evenings and drink alcohol there and have sexual contact. In many people’s opinion this is bad for the community and leads to higher criminality rate again. The last point regarding the social capital is the splitting up of the people who used to live together. Many people in the old area of Pucang Sawit miss the people who were relocated because they became friends over the years. This can create sorrow among the people and will influence the social capital in a negative way. However, over time, these feelings might fade away and the social cohesion of the community will be reinforced.

Overall the surrounding people of the RWS RTs living in Pucang Sawit benefit a lot from the relocation. They are better protected against floods and have a park situated next to their living area where they can do different activities. However if the people do not start changing
their attitudes towards the relocation they will have difficulties with becoming happy regarding the new park and the relocation programme.

4.5.6 Further outlook

Decisive for an overall positive outcome on the people’s livelihoods the attitude of the people towards the park has to change. In particular the maintenance is very important to benefit from the newly built park. Maybe the people of Pucang Sawit should get in touch with the government and have a dialogue about the future maintenance of the park. If there are improvements in communication and interaction both groups would obtain significant benefits from the newly built park. The government would have more satisfied citizens in the area of Pucang Sawit and fewer complaints and at the same time the people in Pucang Sawit would change their attitude towards the park and accept their responsibility to maintain and use the park.

4.6 Evaluation of goals

4.6.1 Introduction

In advance of the project, both, the to-be-relocated families and the municipal administration had specific goals. This chapter shall answer to what extent those expectations made towards the resettlement policy were satisfied. For that, the two stakeholders’ goals – stated implicitly and explicitly – will be taken into consideration. The examination of this question is a central point in assessing the relocation’s degree of success, since it can show the actual outcomes of the resettlement and how they may stand in contrast to their stated goals.

4.6.2 Theoretical Framework

To answer this question, the goals stated ex-and implicitly by the to-be-resettled households and the municipal administration there have been several points implemented into the surveys. Both the questionnaires and the interviews were used to get useful data. The questionnaires done with the households in the new settlement, Mojosongo and interviews conducted both in Mojosongo and Pucang Sawit, aimed at collecting mainly data on the households’ goals and the perceived outcome. It has to be added that those surveys were conducted only in the new settlement. Since not every household from the old settlement moved to Mojosongo, those cannot be recorded. The interviews with the municipal administration should record the government’s goals and their perceived outcome. Additionally, further interviews with other experts should take a more differentiated view on the matter possible.

After reviewing the results of the questionnaires and the interviews, it became clear that the original aim, to identify the goals of the two parties, could not be accomplished. The research data basically captures the outcome of a dispute between the two parties. The reason for this is that the relocation has already been carried out at the time of the interviews. Therefore, the questionnaires and the interviews could not capture the original goals. So the
question is: How can the current data be used to identify the original goals? Firstly, three assumptions have to be made: (1) The two parties had certain goals with regard to the relocation, (2) there is no taking into account the possibility of existing disparities within the two parties and (3) there has been a process of compromise which led to a final agreement. Then the data will be analysed with a model introduced by (Tarnow, Watt, & Silverberg, 1996) and (Fisher & Ury, 1981). This approach allows to distinguish between interests and goals.

This distinction between interests and goals of dispute parties are given serious consideration in conflict literature. The first to come up with this concept were (Fisher & Ury, 1981). According to them, in negotiations it is essential not to focus on the positions of parties involved, but to analyse the interests instead and then invent new options for mutual gain. (Tarnow, Watt, & Silverberg, 1996) modify the theory. According to them issues, positions and interests are part of every dispute. The issue is what the dispute is the subject of. The parties can bring up positions, which are proposals on how to solve the problem. The interests are the expression of a party’s needs. The interests drive the positions and the positions are therefore an expression of certain interests (c.f. Figure 110). Since the data of the interviews and the questionnaires is analysed with the methods introduced by Fisher and Ury (1981) as well as Tarnow, Watt and Silverberg (1996), from this point on, goals will be differentiated into positions and interests. This also concerns the first assumption made. In this case, those goals would be interests. More detailed explanations of the model will be given in the process of the text.

![Figure 110: Exemplary connection between parties, interests, positions and an issue at stake](own figure, 2015)

How is the data applied in the model? For that, every piece of information is taken into account. It has to be interpreted whether it is an expression of a position or an interest. That can be of implicit and explicit matter. Then the sorted data is compared with the scheme of positions and interests. During the analysis, it became clear that the data covers primarily
only the positions. There is only rare information about the interests. To fill those gaps, information is interpreted and applied to the model.

The steps in this work will be as followed: (1) Identification of the interests, (2) identification of the positions, (3) comparison of the interests and positions with the actual outcome of the relocation. In each of those steps, first there will be a summary of the results. Then, afterwards there will be a detailed explanation of how those results have been achieved.

4.6.3 Interests of the involved parties

Table 20 gives an overview of the different original interests of the two parties, the municipal administration and the households, before the relocation programme was started. Those interests that show conformity are on the same row in the table. Conformity stands for two interests, which show potential for same positions resulting from them. After the table, every row of the table will be explained in detail in the text.

<table>
<thead>
<tr>
<th>Interests of the Administration</th>
<th>Interests of the Affected Households</th>
</tr>
</thead>
<tbody>
<tr>
<td>well-being of the citizens</td>
<td>Equal or higher quality of life</td>
</tr>
<tr>
<td>removal of informal settlements</td>
<td>legal land tenure</td>
</tr>
<tr>
<td>lowering costs</td>
<td>protection from natural hazards</td>
</tr>
<tr>
<td>make the river navigable</td>
<td></td>
</tr>
</tbody>
</table>

Table 20: Comparison of interests of affected households and municipal administration
(own table based on interpretations, 2015)

4.6.3.1 Well-being of citizens

Very important to the households is a stable or increasing standard of living. This, of course, also concerns the people living in the surrounding, the settlements neighbouring the off-settled area. This interest has not been mentioned in any interview explicitly, but can be interpreted as implicitly stated. The interest to maintain the quality of life is set opposed to the interest of the municipal administration to assure the well-being of the citizens. That the government has an interest in the well-being of the citizens has not been stated explicitly in any interview, but nonetheless it is mirrored in many references (e.g.: “[...] the city government of Surakarta initiated a programme which aimed at saving the people from that difficult situation” (Selfi, 2014). Those references can be found in the interviews of governmental members as well as in the ones taken of the households. In general the pattern shows that a lot of positions which are taken by the government are perceived as being beneficial for the households. Exemplary Selfi (2014) states in context of the flood that “[...] the suffer[ing] is supposed to be ended so the government provide[d] them with free house” or Sukendar (2014) refers that “[t]he main reason behind relocation programme was the city government was concerned about the destiny of the condition of the people who are flooded [...]”. Lastly, the fact that the households opinions are taken into account is also an expression of the governmental orientation towards the well-being of the citizens. Alternatively people could have also been evicted without any say in the matter. But it has to be said that this interest of the government can also be used as a cover-up for other interests.

4.6.3.2 Legalisation of land tenure

The government’s major interest related to the resettlement is the removal of informal settlements in the city area (Budi, 2014). Relocations in Surakarta are not unusual. Therefore, the resettlement of the households in Pucang Sawit as part of this measure executed in the
whole urban area is a logical step. In the interviews, other examples for resettlements of informal like riverbanks or graveyards were named (Selfi, 2014). As a result of those governmental measures, people seek for a legalisation of their land. Apart from not having to fear eviction, this gives them other advantages like being able to open their own bank account. Only when one possesses legal documents of their tenure, the bank allows the opening of a bank account. This enables people to raise a loan. With that, a lot of new options for an improved living quality and financial stability are given (Winny, 2014).

4.6.3.3 Cheaper protection from natural hazards
Another interest is to ensure protection from the risk of flooding for the people living on the riverbank. Moving the settlement out of the endangered zone not only has humanitarian reasons, but includes also economic advantages. In a cost-benefit comparison it became clear that a relocation measure is the cheaper option compared to the alternative of paying financial compensations after every occurring flood event (Kendar, 2014). But it is not clear whether these kinds of compensations have been paid at every event. If that is not the case, the interest of lowering costs would be partly invalid. It is also clear that the households have a general interest in surroundings which don’t expose them to any risk. This is also mirrored in the results of the questionnaires held in Mojosongo. The most significant expectation towards Mojosongo was safety from flood.

4.6.3.4 Navigable river
The government also wanted to regain the usability of the river for transportation (cf. “an ambition to bring back the glory days of Surakarta River [which could be used …] for transportation. At the river near […] the city hall used to be a port […]” (Kendar, 2014). There is no specific interest of the households which shows conformity. But since there is no interest of the households conflicting with the realisation of this interest either, it could be potentially implemented after the relocation.

4.6.4 Positions of the involved parties
In the course of the dispute which originated out of the mentioned interests, the two parties obtain partially conform and partially non-conform positions. The identification of those positions is mostly the direct result of the survey. They show the outcome of the preceding dispute. Those positions show the situation as it is now after the relocation, when the survey was conducted. The first part of the analysis already showed that the interests are not diametrically opposed to each other but rather show conformity. It is therefore not surprising that there have been positions obtained during the process of dispute which serve the interests of both parties more or less equally. Those positions are shown in Figure 111. In this figure, the identified interests of the two parties are connected to those formulated positions which have been caused or are influenced by them. After the figure, each position shown will be explained in detail. This includes explaining from which interest of which party it derived, describing the position in detail and laying down possible measures to reach the position.
4.6.4.1 Satisfaction of basic needs

The government’s interest in the well-being of the citizens is mirrored mainly in the first position of providing basic needs in the new settlement. But at second glance it becomes clear that this position could also just been taken to promote other interests. (Gamal, 2014) for example says that providing the basic needs in a new settlement should serve as an incentive for the households to move from the riverbank in a new settlement. This incentive would satisfy the interest of the households for maintaining the standard of living. The parties agreed to certain measures which should assure this plan. Although the main purpose of keeping the standards of living quality of the households or even increase them was clear to both parties, they formulate the sub-positions differently.

The government’s measures to achieve the position of satisfaction of basic needs are:

- Retaining the network of the peoples’ social environment, by moving it as a collective. The network for the communities in Surakarta is very important. It is also strongly linked to the communities in their direct surroundings. The direct neighbourhood is very important for the social network. The plan of moving the households as one unity should assure that this community is not torn apart (Kendar, 2014)
- Finding a new suitable location. The new location has to meet some standards in different terms. It has to be affordable for all households and must be within the budget which the government granted the families. Furthermore, the new area has to have good accessibility and be as near to the centre as possible (Sukendar, 2014)
Help with the setup of a house. This measure was not specified in any interview. They assured the financial aid and a setting up. But there has not been any further comments, in what way exactly this support in setting up the house should be (Sukendar, 2014)

Provision of basic infrastructure in the new settlement. In the interviews, mentioned were sanitation, water supply, electricity and pavements. This was already implemented in the old settlement, but the quality of new infrastructure should be better (Sryono, 2014)

The sub-positions of the households in the context of living quality are not as specific. But the interviews showed a shift from the interest of just maintaining the quality of life to the position of an actual improvement of the quality of life. The reason behind this may be promises from the government to make the resettlement tempting, or from the anticipation causing a heightening of the standards of living. Most of the in Mojosongo questioned households had an expectation for help from the government. Only some do specify. Identified sub-positions in this context were:

- Help from the government with the construction of the new house
- The provision of infrastructure such as sanitation, water supply, electricity and public transportation. Although, as listed previously, the government states providing basic infrastructure also as part of their sub-position, the households expected a more comprehensive basic infrastructure. For example the government doesn’t mention a setting up of public transportation
- Schools and other education for the households’ children
- Improvement of the financial situation. With the legal land tenure and the then following ability to open a bank account, individuals are able to apply for a loan.

4.6.4.2 Conversion and re-use of riverbank area

(Selfi, 2014) said that the position for a conversion and re-use of the riverbank area of the off-settled area actually mainly originated out of the interests of the remaining communities neighbouring the relocated area. This party and its’ interests are not listed, because the research question focuses only on the resettled families. But since this position can also be derived from the interest of the well-being of the citizens of the municipal administration it is part of this analysis. The resulting position of the government was to establish a terrain with a combination of economical and recreational usage. People should benefit from maintaining and harvesting on-site planted mango trees. The trees would be in the eastern part of the area, which is rather remote and also rather slender. An additional, newer plan is the extension of the agricultural usage by planting crops and herbs. The financial assets from this usage shall also benefit the neighbouring households. The recreational usage should derive from the establishment of a park. Additionally national tourism or tourism from within the city is planned. The touristic attraction should be a water park (Selfi, 2014). But as already mentioned, the interest of the well-being of the citizens can also be used as a cover-up for other interests. Converting the usage of the riverbank would be a really good measure to prevent future informal settlements on the same site.

4.6.4.3 Land certificates

The government’s interest of clearing all informal settlements and removing the households from the riverbank should be resolved by the promise of meeting the households’ interest of legal land tenure. The choice between an eviction and the now realised more participative resettlement policy is at first appearance influenced by the desired governmental well-being of the citizens. Also the issuing of new land certificates is an accommodation from the
municipal’s administration side. Alternatively and legally, the households without any legal land tenures could have been just evicted. The legal certificate for a new property should be issued when the settlers move from the riverbank to a designated new area (Sryono, 2014). Also, in this case, the government names as the reason for this accommodation their interest in the well-being of the citizens. But the alternative to the approach of the issuing of legal land tenures in another site would have been way more conflict prone. The evicted households, with nowhere else to go could have started protests. The situation would have been stuck. So maybe the government just decided to choose the option with the least potential for conflicts.

4.6.4.4 Protection from natural hazards

The government’s interest of lowering the costs of repairing the settlement after every flood event conforms with the households’ interest of protection from natural hazards. The new settlement should be safe from any natural hazards. So the costs for renovations of the infrastructure would lessen and the threats from natural hazards would be gone. The alternative to finding an area which is secure from natural hazards would have been just to ignore the problem. But as the government has an interest in the well-being of the citizens, it was decided to help with that issue (Kendar, 2014; Gamal, 2014). Also here, the pretext of the two interests, the well-being of the citizens and the lowering of costs has to be seen in a critical matter. Of course those interests would be a legitimate reason to find a safe site, but probably other interests are also playing a role. So this might just be another try to serve an incentive for the households to move to the new site.

Bringing back the function of the river as a mode of transportation is an interest of the government, but there has been no further explanation in the interviews whether there have been any efforts in reaching that outcome. This could lay in the rather unspecific nature of the vision. Therefore, it was not considered any further in this analysis.

4.6.5 Outcomes of the evaluation

The analysis of the outcomes will be conducted in the same manner as in the previous chapters. The explanation of the positions’ outcomes will be in the same order as the positions have been described in chapter 4.6.4.

4.6.5.1 Satisfaction of basic needs

In chapter 4.3 the situation of the new settlement, Mojosongo is analysed by a livelihood-approach. The results will be used in this analysis to partially evaluate the outcomes regarding basic needs of the resettled households. First, the outcome of the municipal-administration’s sub-positions will be analysed:

- Retaining the network of the peoples’ social environment, by moving it as a collective: The community has found a new settlement in Mojosongo, where most of the households could move to. The households did not move all at the same time. Also every household that was provided with the money had to buy the land in Mojosongo one by one. So when the demand for land in this area rose, also the price per unit increased. Some of the households who wanted to resettle with their community couldn’t afford it anymore and had to look for land elsewhere (Gamal, 2014). As it was stated in the introduction, those households who left Pucang Sawit but could or did not move to Mojosongo are not part of the survey.

- Finding a new suitable location: The new location was found in Mojosongo. As explained before, it should be central and be affordable within the government’s budget. It fulfils the demands only partially. As already mentioned before, when the prices of the land rose, it was not any more
affordable for all resettlers. Concerning the centrality, the data from the livelihood analysis in chapter 4.3.2 allows investigations in the accessibility of different assets.

- Providing a new house:
  Apart from the money, there is no record in the interviews of the government of what the government’s help in providing the house consisted. Probably this was also not enough communicated with the communities upfront, before the relocation. This may have resulted in a disparity of expectation and actual outcome from the households’ site. The houses were built, but substandard. One member of a resettled household expressed his disappointment. He said that he was expecting a whole house not just an unfinished one.

- Provision of basic infrastructure in the new settlement:
  As the livelihood analysis in ... already shows the quality of the infrastructure in Mojosongo is perceived way better than in Pucang Sawit. The previous chapter identified that demand of sanitation, water supply and electricity has been fulfilled. A sewage system has not been mentioned in the position, but was installed nonetheless. Probably the questioned people take a working sewage system for granted and thought it was not worth mentioning. Also there is a new public transportation line.

In the next step the sub-position of the households will be related to the outcomes:

- Help with the construction of the new house:
  People complained in the interviews about an insufficient help or about a house which is substandard. That means that there was help with the construction of the house but apparently it wasn’t as much as expected.

- The provision of infrastructure:
  The questionnaires show that the provision of a sewage system, water supply and electricity was fulfilled. Additionally a waste disposal system has been set up. The demanded public transportation system was set up in the form of a new bus line (Sukendar, 2014)

- Education for children:
  Neither the interviews nor the questionnaires produced data which can determine whether this demand has been fulfilled or not.

- Improvement of the financial situation:
  As the already investigated impact on the financial capital in ... shows, incomes increased and access to loans was granted. But also the expenditures rose and some households still don’t have a land certificate. One can say that the demand of an improvement of the financial situation has been fulfilled only partially. Some households benefit from the relocation, while some households don’t have financial advantages.

This listing of positions to assure the satisfaction of basic needs is probably not complete. As many factors come together to assure a certain standard of living, parts can be easily forgotten when interviewed.

Regarding the outcome summarised in Figure 112 and Figure 113, in contrast to the position, there is quite a sum of non-achievement. The overall-demand of the satisfaction of basic-needs and its essential features has been accomplished. Only in further inspection of the sub-goals weaknesses can be uncovered. That is, why the position is marked as partially accomplished.
### Figure 112: Subpositions of governmental agencies to provide households with basic needs (own figure based on interpretations, 2015)

<table>
<thead>
<tr>
<th>moving as a collective</th>
<th>not affordable for every household due to price increasement</th>
</tr>
</thead>
<tbody>
<tr>
<td>suitable location</td>
<td>not affordable for everyone</td>
</tr>
<tr>
<td>providing a new house</td>
<td>houses are provided</td>
</tr>
<tr>
<td></td>
<td>houses are substandard</td>
</tr>
<tr>
<td>basic infrastructure</td>
<td>sanitation, water supply, electricity, sewage system, public transportation</td>
</tr>
</tbody>
</table>

### Figure 113: Subpositions of resettled households (own figure based on interpretations, 2015)

<table>
<thead>
<tr>
<th>help with the construction of the new house</th>
<th>government helped, not as much help as expected</th>
</tr>
</thead>
<tbody>
<tr>
<td>provision of infrastructure</td>
<td>sewage system, water supply, electricity, waste disposal</td>
</tr>
<tr>
<td>Education for children</td>
<td>no data</td>
</tr>
<tr>
<td>Improvement of financial situation</td>
<td>incomes increase, access to loans, not everybody has yet a legal land tenure</td>
</tr>
</tbody>
</table>

#### 4.6.5.2 Transforming the riverbank area

In 4.3.2 the conversion and re-use of the off-settled area is analysed more in depth. Here it is referred to as the gained results. In summary, it is to conclude that the very complex position of setting up a good conversion and re-use of the riverbank area has only been partially accomplished. The recreational offers of the park are only used by very few people. Interviewees talked of abuse of the area in terms of “adultery things” and vandalism (RT01
Riverbank, 2014). Exceptions are festivals which are held in the area regularly. But they yield no profit because of inadequate organisation (RT03 RW06, 2014). There are also many waste-burning places in the area, which impair the image and the recreational usability of the park and are harmful for the environment. The financial benefits which should derive from the area are not yet fully tapped. The mango trees have been planted, but management-issues are yet preventing an efficient usage (RT02 Riverbank, 2014). The plantation of the herbs has not yet been realised because this plan was just made before the interview in October 2014. The idea was to realise it with the beginning of the rain season 2015. Additionally, identified interest of the government was to change the usage of the area to prevent new informal settlements. As it is now, this plan succeeded. In the area, are no new settlements. But looking at the morbid structure of the facilities, without maintenance it could be possible that a new informal change of the usage will happen at some point. In summary once again, the position is achieved in its essential features but has potential for improvement and is therefore categorised as partially accomplished.

### 4.6.5.3 Land certificates

As it appeared in October 2014, the position of issuing a land certificate to every resettled household was not yet completed. In the interviews with the resettled families, people complained that they or some other house owners did not yet receive their land certificates. Also the municipal administration admits that the bureaucratic process takes too long. Normally the issuing should take no longer than 60 days, but some people already wait more than four years for their documents. The interviewees blame the many different offices which are responsible for the issuing. In this process of communication between them, a lot of time is lost (Sryono, 2014). But (Sryono, 2014) assured that also if it might take very long, everybody is going to receive their certificate eventually. One can see the tendency here that the interest of the government to assure the well-being of the citizens becomes a secondary interest. Now, after most of the households are resettled, the pursuit of the initial promise of issuing a legal land tenure is not complied in a sufficient way.

Also, the removal of all constructions off the riverbank with the incentive of legal land tenure could only be accomplished partially. Only around 100 families of the total number of around 150 left the riverbank of Pucang Sawit (RT02 Riverbank, 2014). As the household status of legal land ownership was not uniform in the old settlement, there has been segregation in a way that all former informal settlers already moved and some legal landowners decided to stay. This is because the incentives to stay for households with legal land tenure are not so high. They already have privileges, like, for example, being able to open their new bank account. Those land-owners have a certificate for their land. But the certificate states only a legal use of the ground which does not include building a house. The removed households, however, normally do not even have a certificate showing that they own the land (Selfi, 2014).

An interview with a representative of this area showed that they agree with the relocation in general, but are not content with the conditions tied to it. Since they have a better position of negotiation than the families living informally, they formulated tougher conditions under which they would be willing to move. The central demand is a fair reimbursement of the houses to be left. They don’t agree to the condition that houses of different quality and size are valued with the same amount of money to be paid as compensation (RT02 Riverbank, 2014).

The fact that those households won’t move in spite of the danger of another flood gives interesting insights on the weighting of the interests by the households’ site. Apparently it is more important for them to get a good compensation for their old settlement than to be safe from the floods. Only when they get the certain threats or incentives like the ones listed
above (Improvement of living standards, issuing of legal land tenure) are they willing to move.

In conclusion, it can be said that the fulfilment of the position of providing legal land tenure in a new area reveals that interests linked to it are also only partially met. The municipal administration’s interest of removing all informal settlements was not met as it was expected. That was due to the remaining, still on the riverbank living community. Furthermore, the interest of the households of getting a land certificate is not completely satisfied yet. Apart from the waiting due to the long processing time, people could also not yet use the advantages coming with legal ownership of land. But for the future, the problem is supposed to be solved when all the land certificates are issued. If this is really going to happen has to be seen critically. Also that it did not happen in the time span until the survey is an issue which cannot be underestimated. Since those individuals cannot profit from some benefits of the new location like the bank loan, in combination with the increased expenditures they are more likely to have an impact on their livelihoods due to that matter. Also this position gets the categorisation of partially achieved.

4.6.5.4 Protection from natural hazards

The next position, guaranteeing the protection of the resettled people from flooding hazard, was reached partially. The risk of being flooded by the river Bengawan has been resolved. The new area is located on higher grounds and there is no river nearby. But in the new location in Mojosongo there are risks of flash-floods of a nearby stream as well as flood-induced landslides. The reason lies in the topology, which is valley-shaped. The area of the new settlement has steep sides and forms a basin-shaped area. All over this area, the houses were built (c.f. Figure 114). This means that Mojosongo is primarily endangered in precipitation-related situations. The steep sides of Mojosongo are prone to landslides (Gamal, 2014). The rain macerates the soil and it could possibly be set into motion. The deep-lying areas are prone to flash-floods. Water accumulates in the holler and floods the houses situated there. Those floods could be prevented by a more efficient drainage system (Winny, 2014). However, it seems that this flood is comparably probably less devastating and affecting comparably fewer houses than in the old settlement.

By both parties, the municipal administration and the resettled households, the natural hazards in Mojosongo are perceived to not cause as many difficulties as the floods in Pucang Sawit. Neither in interviews with experts, with household-representatives nor with the administration was there a detectable sign of fear that the landslides or the high water could cause more trouble than the river on the old location. This perception is of course no scientific assessment. Of course the government’s interest in lowering the costs is only met in that way that the expenditures for repairmen in case of a disaster in Mojosongo are supposed to be less than in Pucang Sawit. Also for the households, the risk of natural hazards is still present, but it is not experienced as severe. This could originate in the expectation that both, the landslides and the high water do not occur frequently. Additionally, they do not affect the whole community but only a part of it. As those assumptions regarding the severity are not scientifically proven, it is clear that the status of the position protection from natural hazards can change with new events from partially accomplished to not accomplished.
Urban Resilience in Indonesia

4.6.6 Conclusion

In conclusion, there should be an answer given to the research question if the relocation fulfilled the goals formulated in- and explicitly by the relocated families and the municipal administration. Looking at the achievement of fulfilment of all the positions, one sees that all demands only have been accomplished partially. But as already explained in 4.6.2, positions are only solutions to solve ones interest. The actual interesting outcome is the fulfilment of different interests. Winny (2014) says that “[t]he government has the most advantages. Also most of the people are happy, but few are not”. This depicts the situation quite well. The patterns (c.f. Figure 115) show an only partial fulfilment of all interests. That the households’ interests are only met partially results in an unequal distribution of the benefits resulting from the relocation. Most of the families profit from the measure. However, some individuals couldn’t sustain or improve their reached quality of life, and still don’t have a legal land tenure or are still exposed to natural hazards. The government non-fulfilment of their interests has three primary reasons. The still remaining households on the riverbank are yet to be resettled, the new location is also prone to natural hazards and could also impale costs, and the provision of basic needs in Mojosongo is not yet assured.
So, all in all, one can say that this is an example of a resettlement where both parties’ interests are partly served. The consideration of requests of the households and the participative character of the relocation do not change the fact that a resettlement is a huge intervention in the sphere of a community and their families. The positions on which the two parties agreed are measures to diminish this impact.

### 4.7 Overall conclusions

As you can read in the introduction, the city of Surakarta is a forerunner and role model to many policies concerning city development. Among these policies, the relocation policy of Surakarta was the fundamental element of our research. Explicitly the relocation of informal settled people from the Kelurahan of Pucang Sawit to the Kelurahan of Mojosongo was investigated. Next to the detailed conclusions of all four previous chapters, this conclusion will link the four main research questions and also give an overall conclusion to the relocation. Answers to the meaningfulness of the relocation, how the relocation worked out and who benefited most will be given.

#### 4.7.1 Linkages between research questions

To gain results from the research made in September 2014, the research questions were restricted in some ways. Firstly, the data collected to answer the questions must have been collected within four days to fulfil the research timetable. Connected to this restriction, the
research questions should not go beyond the scope of the research and topic. Secondly, the research questions should not overlap but have a clear connection to each other. And thirdly the questions should cover a wide spectrum and give the basis to use as much data acquired as possible.

While question one and three mainly focus on the household level by evaluating changes of the relocation using the sustainable livelihood framework, question two and four use the administrative level next to the household level to analyse and assess the relocation process as it is shown in Figure 116. Especially a comparison of question one and three, and two and four are of great interest. Concerning question one and three both chapters come up with interesting results regarding the sustainable livelihood framework. However when comparing both, you get an even more interesting result. The resettled people, now living in *Mojosongo*, as well as the neighbouring RW’s RTs in *Pucang Sawit*, both benefit from the relocation. Even if there are small things to improve or are not working as well as expected, the data gained by household interviews, expert interviews and own mapping show that the living conditions have improved on both sides. This finding then again can be proven by the results coming from question two. The level of satisfaction concerning the relocation process is very high and therefore leads to the assumption that the people also realise the improvement of their living conditions. Additional to these results, question 4 then shows on a more abstract level possible improvements for future resettlements as question four analysed to what extent the goals stated by the relocated families and the municipal administration were fulfilled.

![Figure 116: Connections between the four research questions](own figure, 2015)

### 4.7.2 Needs for relocation
The city of Surakarta would not be a role model for relocation programmes if there would not be any pressure on the population of the city leading the city to react. The pressure coming from natural hazards is especially powerful. Together with that, the city of Surakarta
also has problems with illegally settled people. The main problem arises when illegally settled people settle on hazard prone areas because the government has to react if the people become affected by natural hazards. In this case, the natural hazard is mainly flood. So when illegal settlements get flooded and most of the people are affected in different ways the government has to help those people, even if they are settled on prohibited areas. To reduce the costs provided by the government and to sustainably help the people, the city of Surakarta saw the necessity to relocate a lot of people. These relocation programmes are very meaningful for both parties, the government and the relocated people. The government’s advantages are costs reduction, because they do not have to pay any more reconstruction bills after a flood, and a more satisfied population, because the people will not only be mainly safe from natural hazards but also get a land certificate and therefore become a citizen with legal property. These two points, the protection from natural hazards and the land certificate, are the two main advantages for the relocated people. To further improve the living conditions in Surakarta, there is and will be more need for relocation programmes. To what extent these programmes should be improved and modified will be stated later in this conclusion.

4.7.3 Relocation benefits

The relocation was mainly a success stated by the relocated people as well as by the municipal administration. But which party benefited more from the relocation? It might be obvious that the relocated people have a better living condition now and therefore improved they standard of living. This assumption can be justified by the results from question one. Especially the promised land certificates increased the people’s quality of life because they do not have to fear eviction anymore. However, the social part of the relocation is very powerful. Most of the people complained about the breakup of their former community because not everyone from Pucan Sawit made it to resettle in Mojosongo. Even if the facade of the people mainly seemed to be happy, the feelings and emotions connected to the resettlement might hurt them for a long time.

In contrast, the municipal administration seemed to be very satisfied. On the surface it appears that they made everything for the benefit of the people and to save money from reparations. They wanted to protect the people from natural hazards, and to do so, they provided them with money and a land certificate. However, from our research it was not clear to what extent the people were forced to move and if the motivation of saving costs is not just pseudo. The hidden motivations of the government however cannot explicitly be analysed.

4.7.4 Realisation of the relocation programme

First it has to be said that the relocation worked very well. Next to some room for improvement, most of the relocated people and the municipal administration were satisfied. The need for the relocation was obvious and the compensation for the people was fair and appropriate. Next to the resettled people, also the people still living in the „old area“ of Pucang Sawit benefited from the relocation as the results from question 3 show. The participation of the people in the relocation programme was also very high with about ¾ of the interviewed households being included in the planning process. However some people were surprised by the houses they got after the relocation. Some thought that the standard of the houses would be greater and not just very rudimentary.

4.7.5 Suggestions for improvement

Next to improvements the municipal administration did on their own during the resettlement process (the money for the resettled people was transferred directly to their bank account after one Pokja was suspected of corruption (Budi, 2014), there is still room for improving the relocation process. As question two concludes there should be a simplification of the
relocation process mentioned by the relocated people. There should also be more transparency to avoid money problems during the relocation process. There should also be a better information system, as some relocated people did not really know what to expect during and after the relocation. The idea of a *Pokja* is very good but the involvement of the people should be easier and as a result, should increase. By doing so, some problems and complains can be prevented. One main problem of the relocation programme is the generalisation of the people. Everyone received the same amount of compensations regardless the size of the family or their present status. This is also the reason why there are still people living on the riverbank in *Pucang Sawit*. These people have different land rights and therefore want to have higher compensations. As RW06 RT03 in *Pucang Sawit* mentioned they would be very happy to be relocated (RT03 RW06, 2014). This RW is still very prone to flood. The government still needs to find a solution there because the only reason why every resettled person is receiving the same amount of money is to avoid jealousy (Selfi, 2014). This rather sounds like an excuse. So if the method used to classify the people’s compensation is transparent and comprehensible there will probably not be jealousy amongst the people.

There are obviously still many things to be changed concerning the relocation programme, but generally the relocation worked smoothly and persuasively. From that analysis some new questions came up. This shows the need to have further research in this area and also shows the ongoing process and its timeliness.
4.8 Bibliography


RT01 Riverbank. (09.28.2014). Local Expert Interview Solo. RT Riverbank. (D. Scheuer, Interviewer)

RT02 Riverbank. (09.28.2014). Local Expert Interview Solo RT Riverbank 2. (L. Hoyos, S. Kubisch, D. Scheuer, S. Sandholz, S. Sandholzer, Nurhadi et al., Interviewer)

RT03 RW06. (09.28.2014). Solo Local Expert interview RT03 RW06. (Nurhadi, Interviewer)

Selfi. (09.30.2014). Interview with Kelurahan Selfi. (Nurhadi, Interviewer)
Sryono, P. (09.29.2014). Interview: Authorities Land Title. (Nurhadi, Interviewer)

4.9 List of Interviews

<table>
<thead>
<tr>
<th>Nr.</th>
<th>Interviewee</th>
<th>Authority</th>
<th>Date</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>RT01Riverbank</td>
<td>Local Expert</td>
<td>28.09.2014</td>
</tr>
<tr>
<td>2</td>
<td>RT02Riverbank</td>
<td>Local Expert</td>
<td>28.09.2014</td>
</tr>
<tr>
<td>3</td>
<td>RT03RW06</td>
<td>Local Expert</td>
<td>28.09.2014</td>
</tr>
<tr>
<td>4</td>
<td>Budi, P.</td>
<td>POKJA Pucangsawit</td>
<td>29.09.2014</td>
</tr>
<tr>
<td>5</td>
<td>Selfi</td>
<td>Kelurahan of Pucangsawit</td>
<td>30.09.2014</td>
</tr>
<tr>
<td>6</td>
<td>Pah Agus Triyono</td>
<td>Kelurahan of Mojosongo</td>
<td>30.09.2014</td>
</tr>
<tr>
<td>7</td>
<td>Sukendar, P</td>
<td>City Council of Surakarta: Office for community empowerment</td>
<td>29.09.2014</td>
</tr>
<tr>
<td>8</td>
<td>Sryono, P.</td>
<td>Head of BPN (Land Title Authority)</td>
<td>29.09.2014</td>
</tr>
<tr>
<td>9</td>
<td>Winny</td>
<td>Universitas Sebelas Maret Surakarta</td>
<td>29.09.2014</td>
</tr>
<tr>
<td>10</td>
<td>Gamal</td>
<td>Universitas Sebelas Maret Surakarta</td>
<td>29.09.2014</td>
</tr>
</tbody>
</table>

Table 21: Overview on interviews conducted in Surakarta (own table, 2015)
5. **Urban Resilience in Indonesia – Discussion and conclusions**

Authors

Karl Michael Höferl
Christian Obermayr
Simone Sandholz

To integrate the findings presented in the previous chapters, we need to refocus on the central interest of this elective area ‘Development Research’: Urban resilience against socioeconomic processes and natural hazards.

Besides normative perspectives on urban resilience (c.f. UNISDR 2012) our work followed an analytical and evaluative approach. Urban growth is among the major global challenges with particular importance to developing countries. A large share of urban population is already living in areas at risk, further endangered by environmental deterioration and/or climate change impacts. Such self-enforcing processes are regional and local manifestations of Global Change and will impose further stress on natural and societal systems in the years to come (UNEP 2012). These systems will tend to adjust to such stresses in a process termed adaptation (Berkhout, Hertin & Gann 2006). In contrast to evolutionary adaptation in natural systems societal adaptation processes have proven to be more contingent. Here the spectrum of adaptation responses ranges from ignorance to proactive strategic management (Diamond 2005). Since the early 2000s a variety of frameworks (e.g. Birkmann et al. 2013; Smit & Pilifosova 2001; Klein, Nicholls & Mimura 1999) have been developed – including concepts like resilience – to offer an ontological basis for possible responses to uncertain or ambiguous socio-economic and natural impacts.

Beside a strong and ongoing conceptual discussion, a number of questions on the significance of resilience as an analytical and prescriptive concept have been raised in the last years (Christoplos 2014; Cannon & Müller-Mahn 2010). While some authors complain about the concept’s under-theorized social dimension (Cote & Nightingale 2011) or its conservative perspective on the persistence of systems (MacKinnon & Derickson 2013) others critique the neglect of internal, endogenous social dynamics of a system necessary to achieve resilient development (e.g. Cannon & Müller-Mahn 2010: 630). The latter critique results in the question “[... how resilient urban development is] brought in practice, and under which conditions societies or social groups decide to change livelihoods or production practises to avoid harm or take advantage of expected changes” (ibid.:630).

With special regard to these endogenous social dynamics and their outcomes, we understand resilient development as an ongoing, learning-based process, fostering robustness, adaptability and transformability of physical, organisational and societal structures (Folke 2006). In our Yogyakarta study case we use this definition to analyse the robustness,
adaptability and transformability of inner-city *Kampungs* with regard to socio-economic development processes and natural hazards. Shifting the emphasis on the transformability of a socio-ecological system, Surakarta case we evaluate if hazard-driven relocations can foster urban resilience and sustainable local livelihoods.

5.1 Yogyakarta: Squaring the circle – taking chances and avoiding risks

As mentioned before, main aim of the Yogyakarta case study was to analyse the robustness, adaptability and transformability of three inner-city *Kampungs* regarding socio-economic development processes and natural hazards along Cade River (see chapter 3). Empirical work was based on field surveys, map-based interviews with local key actors and questionnaires to show in a first setup formal and informal strategies for coping with disruptions due to economic processes or natural hazards. These strategies were grouped into five categories: disaster risk reduction, environmental management, urban development, tourism development and community-based economic development. For each category the impacts on the robustness, adaptability and transformability of the *Kampungs* were finally identified and evaluated.

In each category, most of the detected strategies – like using sandbags to raise existing floodwalls or removing waste from the river – aim at enhancing the community robustness. Despite this focus on robustness, we also found hot-spots for adaptive and transformative local strategies.

In all three *Kampungs* we found local environmental management activities – mostly focussing on the treatment of solid waste – with the clear aim to transform existing socio-ecological relations. Why such transformative actions remained limited to the field of environmental management can only be presumed. One reason might be a better (non-)governmental support for environmental topics from outside the *Kampungs*. Another assumption is the contested political status of transformative actions in other fields, like resettlements schemes for disaster risk reduction. In the latter field a limited number of adaptive activities can be found in all *Kampungs* under investigation: mostly governmental actions, like the heightening of existing wall embankments, evacuation planning or (in-)formal early warning systems. An eye-catching aspect of these adaptive actions is that in most cases these actions are based on (non-)governmental actions before them. A similar pattern can be found in local small business development. Here, local entrepreneurs proved to highly adaptive to touristic developments (mostly hotels) imposed on the *Kampungs* by external developers.

To sum it up, all communities within the research areas have the potential to create or enhance urban resilience. Although the communities evaluated their own socio-economic strategies as positive and useful, there are huge differences between the *Kampungs*, despite their proximity. These differences cover on the one hand the absolute number a range of actions, on the other hand different mixtures of actions focussing on robustness, adaptability and transformability. One of the main future challenges on the way towards urban resilience in these *Kampungs* is to find balanced strategies suitable for the respective community. ‘Balance between actions’ means sound holistic strategies covering a) measures focusing on robustness, adaptability and transformability and b) applying these measures across the fields of action with relevance to a given community. Such balanced strategies enable communities to take actions for disaster response and preparedness. At the same time, such strategies enable communities to participate and benefit from socio-economic development processes – like the ongoing ‘tourification’ of certain parts of Yogyakarta – on an urban scale.

Applying this line of thought on our three *Kampungs*, widening the scope of action towards adaptive and transformative activities would be promising and could sustainably reduce risks. Overall, such a progressive development path will turn out to be rather challenging.
contrasted against the current dominance of actions fostering community robustness. Community members for instance often mentioned a feeling of powerlessness and inability to change situations, preventing adaptive actions. Thus, trying to place the actions observed in the three Kampungs in a spectrum ranging from ignorance to proactive strategic management (Diamond 2005), leads to a rather ambivalent conclusion: Despite some adaptive behaviour, most of the strategies observed in the three Kampungs are often not coming close to proactive. These results affirm that the social dimension of resilience (Cote & Nightingale 2011) is a crucial one: Being ware of your own resourcefulness and resulting opportunities to reduce socio-economic and natural risks is an essential basis for any further action taken by local communities.

5.2 Surakarta: Transformability in action?

The Surakarta case study aimed to evaluate the impact of the resettlement policy introduced by Surakarta city government after a severe flood event in 2007. The flood affected 6,368 households in the city, 1,571 of them considered as squatting near the river. As a response, Rp. 20.5 million (about 1,350 €) have been spent on a resettlement programme for each of these households. With this Surakarta’s government tried to reduce the risk of being affected by floods, to restore ecosystem services provided by the riverbank by establishing a green belt and to improve the living conditions of the resettled households by increasing their access to basic infrastructure, adequate housing and security of tenure. Facilitating the resettlement scheme, a community-based steering group called Pokja (working group) was elected by each community to be resettled to guide the planning process, mediate between the community and the government agencies as well as to allocate financial compensations.

As a concept for evaluation, a novel approach was developed and applied to analyse short-, middle- and long-term impacts of the resettlement on local livelihoods (in the old and new settlement areas) and household resilience. To be sensitive to the multidimensional character of impacts this evaluation approach was based on a typology of affected assets – modified from the sustainable livelihood framework. Beside the results in terms of livelihood assets and resilience, also the degree of participation during implementation was taken into account. Empirically, we implemented our approach by triangulating qualitative (semi-structured interviews with neighbours, resettlers and officials) and quantitative (GPS-based mappings and a survey among resettled households) methods. Taking an area in the city district Pucang Sawit with about 100 relocated households as sample, we evaluated the resettlement policy from three points of view: local livelihoods, participation and resilience.

Focusing on local livelihoods, the resettlement led to predominantly positive impacts for the relocated families, especially in case of physical assets, such as better housing quality, land tenure and access to basic infrastructure. Security of tenure proved to be rather ambivalent since about 10% of the resettled households still have not received valid land certificates despite contrary claims by government officials. That three-quarters of the relocated households see an improvement in their living conditions further confirms the overall positive impact of the resettlement scheme on local livelihoods.

Evaluation with regard to participation showed that three-quarters of the households were satisfied with their involvement in the relocation process. In the opinion of both, relocated families and interviewed experts, the program proceeded smoothly during most phases of implementation. Further analysis showed, however, that different degrees of inclusion can be found. They range from ‘citizen control’ during the selection of possible new settlement sites to paternalistic non-inclusion used for the redesign of the resettled areas along the river bank. Although top-down induced, the policy approach used generally created ownership by promoting broad participation of the community and the common voluntariness of many stakeholders from society.

Analysing resilience of the affected households to natural hazards, the case study showed that the resettlement scheme led primarily to an enhanced robustness of houses and physical
infrastructure in the settlements surrounding the resettled areas (the old settlement area). An enhanced adaptability or transformability of households affected by the policy could not be observed. However, due to the small sample and our prime focus on local livelihoods this assessment is limited. Based on our findings further research on household resilience is needed, taking into account a larger and more stratified sample.

Surakarta city government reached its goals of the introduced resettlement policy. Large squatter areas along the river have been cleared, the robustness of remaining settlement areas has been increased and the living conditions of resettled families have been increased. All this was achieved using a participatory approach, leaving the city budget relatively unstrained and creating ownership among the affected households. Considering these findings and the specific guidelines for relocation policies as elaborated by the United Nations (Kothari 2007), Surakarta’s approach can be termed participatory resettlement and does not qualify as forced eviction.

5.3 Final conclusions

Trying to put our results in perspective, the two questions underpinning this three-semester elective area ‘Development research’ might be a good point of departure:

1. What strategies can be found in our Yogyakarta and Surakarta case studies to enhance the resilience of communities living in (partly) informal, riverine settlements?
2. Do these strategies improve community resilience?

Since our two case studies are characterized by rather different settings comparing individual, highly contextualized actions is not expedient. Instead, we used Folke et al. (2010) three dimensional understanding of resilience as regulatory scheme for strategies found in our case studies.

Doing so, we see that strategies of local communities in Yogyakarta to deal with natural hazards and an ongoing tertiarisation (‘tourification’) have a predominant focus on robustness and adaptability. Despite this focus, the overall development path – characterised by tourification, displacement and a growing scarcity of vacant land – remains unquestioned.

In contrast, we can attribute Surakarta’s resettlement scheme a rather transformational character. Being triggered by the flood events of 2007, the resettlement scheme incorporates classic elements of transformative actions “making use of crises as windows of opportunity for novelty and innovation, and recombining sources of experience and knowledge to navigate social–ecological transitions” (Folke et al. 2010: ‘Conclusions’, para. 2). The far-reaching consequences of this transformational approach can be seen (amongst others) in innovative organisational and institutional arrangements to carry out a participatory resettlement scheme.

Reading these last two chapters, one might conclude that Surakarta has hit the ‘resilience sweet spot’ while Yogyakarta has not. Still, we do not think this is a valid conclusion. Being able to distinguish analytically three dimensions of resilience does not imply a normative order amongst them. While it can be argued that adaptability can be seen as a precondition for transformability, identifying transformation as attained goal behind resilience seems exuberant. Further avoiding a mutually exclusive perspective on resilience – stressing a ‘ether robust, or transformative’ narrative – offers us a more productive perspective on resilience: Resilience as the result of a deliberative, community driven process focussed on the interplay between strategies of persistence and change (cf. Folke et al. 2010: ‘Multiscale resilience and transformability’, para. 8).

Following this (rather idealistic) notion of a deliberative and community driven process towards resilience, we can come up with two conclusions:
At a first glance, Surakarta’s participatory settlement approach seems to embody this idea of bottom-up deliberation. Unlike this, the actions in our Yogyakarta case study often seem to be induced by external (state-)actors. Traditionally, such differences have been explained by referencing to barriers, limits and limitations to resilience (e.g. Leichenko, McDermott & Bezborodko 2015, Adger et al. 2008). More recently, some authors (e.g. MacKinnon & Derickson 2013) see the “internalist conception which locates the sources of resilience as lying within the scale in question” (ibid.:255) as one reason for such differences. In combination to the marginalization of certain communities (like informal settlers) this internalist conception favours already resourceful communities and perpetuates existing power asymmetries.

Picking up this critical perspective to review the findings of our case studies, we see the importance of a community’s relational power within a given social and organisational network: In the case of Surakarta’s resettlement scheme, it became evident, that neither the affected households nor the city government had the financial resources for a relocation programme. Only external funds given by the Indonesian state, international organisations like UN-HABITAT and NGOs like Habitat for Humanity made this transformational approach possible. Our Yogyakarta case study is the clear opposite to this surplus of resources coming from beyond the scale in question. Here, we saw that most actions – except some taken to improve solid waste treatment – of local communities were not able to draw from external resources.

Thus, understanding resilience simply as an autochthon attribute of a community in a given socio-ecological setting we miss out the importance of a community’s relational power. This blind spot can be avoided by shifting the focus towards resourcefulness – a community’s relational power – to deploy internal and external resources in a deliberate process to conceive and engender desirable alternative futures. From our research findings we can see, that this local resourcefulness is a key factor for fostering community resilience. This shift towards community resourcefulness might flaw classic best practice approaches towards resilience, since certain best practices can exceed a community’s resourcefulness. So, we think that the relational power of a community within a multilevel social- and administrative network as well as its application in conceiving and engendering strategies towards resilience should receive more attention in further research. This can be done by moving the focus of attention from technicalities of best practices towards deliberation and self-determination; Or as a proverb attributed to Antoine de Saint-Exupery puts it:

„When you want to build a ship, do not begin by gathering wood, cutting boards, and distributing work, but rather awaken within men the desire for the vast and endless sea.“

Adapting our perspective on resilience research in this way (cf. Derickson & MacKinnon 2015), we will have to find in our future research efforts a better balance between our own research interests and the needs and priorities of the communities looked upon. Additionally, we should also try to anticipate effects of political projects that are advanced by the findings of our research. A challenging, but nonetheless worthwhile effort.
5.4 Bibliography


6. Appendix

6.1 Appendix Yogyakarta

6.1.1 Guideline for expert interviews and other key persons

Guideline for expert interviews & other Key Person

Urban planning
1.) What are your urban planning strategies in Yogyakarta?

2.) Are you taking examples on other cities? Is there a role model city/cities?

3.) What are specific strategies related to kampung development? Especially along the Kali Code.

4.) Are you having or looking for private or international investors for your projects?

5.) What are the major urban development challenges you are facing?

6.) What are the urban potential in this city?

7.) Are there any kind of participatory processes for local people in urban planning?

8.) If any, How active are they?

9.) Are there sometimes conflicts and how do you try to handle them?

Tourism
10.) How important is tourism for your urban development strategies?

11.) Are there any specific arrangements to promote tourism and are there any strategies to promote Kampung tourism – any for the Kumpangs along Kali Coder?

12.) What about eco-tourism? Do you consider in developing any eco-tourism along Kali Code?

13.) Are there any kind of participatory processes for local people in tourism planning?

14.) If any, How active are they?

15.) Are there sometimes conflicts and how do you try to handle them?
Natural hazards

10.) What are natural hazards that occur along Kali Code in Yogyakarta?

11.) How do you deal with natural hazards in urban planning?

12.) What do you do with people and infrastructure in risky areas?

13.) Are there any strategies especially for the Kampungs along the Kali Code? From your institution? From the collaboration with other institution?

14.) Are you taking examples on other cities? Is there a role model for natural hazard?

15.) Are there any kind of participatory processes for local people in disaster risk reduction?

16.) If any, How active are they?

17.) Are there sometimes conflicts and how do you try to handle them?

Outlook

26.) What are major future urban development projects in Yogyakarta?

27.) Is there any future management plan from your institution (or collaboration work with other institution) toward urban watershed in Kali Code?

28.) What are major future urban disaster risk reduction projects along Kali Code?

29.) Where and how do you see Yogyakarta in ten years?
6.1.2 Questionnaire for participatory mapping with stakeholder

QUESTIONNAIRE I: Stakeholder & households

Passages in *ITALIC* are comments for the interviewer.

MAP ... questions requiring mapping

Interviewer: ____________________________

Date: ____________________________  Area Code: __________________

Part 1: urban dynamics/development

1. MAP: Has this RT/RW-area changed in the last years?
   Can you indicate the changes on the map?
   
   1.1. What has caused these changes?
       (*-> description of pressures*)
   
   1.2. Indicate the quality (positive, neutral, negative, can not decide) of the perceived changes.

2. Are there processes from outside that are influencing on your area?
   (*-> description of drivers*)
   
   2.1. Indicate the quality (positive, neutral, negative, can not decide) of the perceived processes.

3. MAP: Please indicate areas of special interest:
   - areas people like or are emotionally attached to (e.g. leisure areas, religious use etc.)
   - coined due to crime
   - coined due to economy (describe the economy mentioned)
   - others (if mentioned by the interviewed person)

4. MAP: Please indicate your local infrastructure and services on the map
   (*-> indication of “Hot Spots”*)
   - technical infrastructure (wells, water supply, toilets, waste disposal & other facilities)
   - social infrastructure (doctors, education)
   - private service - business (gastronomy, leisure, trade and commerce etc.)
   - water supply

   4.1. Which one of these infrastructures and services were affected by natural hazards or any other harmful processes?
Part 2: Coping with hazards:

5. **MAP**: Can you please mark areas prone to natural or technical hazards on the map?

6. What kind of strategies (for people and infrastructure) have been applied to reduce these hazard risks?
   
   (-> for each strategy mentioned:)
   
   6.1. Has the strategy been applied in another area before (are you taking any example from other areas/cities)?

   (-> if YES: Where?)

   6.2. When was the strategy introduced? (Older than 1, 2, 5, 10 etc. years)

   6.3. Is it an official or informal strategy?

   (-> if formal: indicate organizations & administrative bodies involved

   -> if informal: indicate involved parties & modes of interaction between them)

   6.4. Have local people been involved in a) developing and b) implementing this strategy (participation strategies)?

   6.5. Has this strategy led to any conflicts or positive effects (e.g. strengthening the community spirit)?

   6.6. Are you satisfied with the strategy? Why?

Part 3: Coping with socioeconomic developments

7. Where do you see your area in 10 years from now?

8. What strategies do you use to deal with the perceived drivers and pressures?

   (-> go through drivers & pressures mentioned in question 1)

   8.1. Has the strategy been applied in another area before?

   (-> if YES: Where?)

   8.2. When was the strategy introduced? (Older than 1, 2, 5, 10 etc. years)

   8.3. Is it an official or informal strategy?

   (-> if formal: indicate organizations & administrative bodies involved

   -> if informal: indicate involved parties & modes of interaction between them)

   8.4. Have local people been involved in a) developing and b) implementing this strategy?

   8.5. Has the development and/or implementation of this strategy lead to any conflicts or positive effects (e.g. strengthening the community spirit)?

   8.6. Are you satisfied with the described strategy?
Part 4: Watershed Management

9. What is the a) quality and b) availability of water/groundwater in your area throughout the year?
   9.1. How deep is your groundwater resource?
   9.2. How much water is used by your household (liter/day)?
   9.3. What is the distance between the well and your bathroom?

10. How do you maintain a clean river environment?

11. Have any watershed management activities been implemented in your area at Kali Code?
    (->if there are any:)
    11.1. Please describe these measures.
    11.2. Have these measures been implemented in another area before?
    (-> if YES: Where?)
    11.3. Have local people been included in the development and/or implementation of these watershed management activities?
    11.3.1. Describe the way of participation applied?
    11.4. Did the development and/or implementation of these watershed management activities lead to any conflicts or positive effects?
    11.5. What is the type of waste disposal (individual or communal)?
    11.5.1. Do you think that the waste disposal is affecting the river environment quality?
    11.5.2. What is the distance between your house and the river?
    11.5.3. According to you, how to maintain a clean river environment?

11.6. What maintenances are taken by the inhabitants?

11.7. Is there any government or NGO intervention? What is it?
6.1.3 Household questionnaires

**Guideline for Household**

**Business and Urban Development questions**

1.) Are you a local people or newcomers (pendatang)?

2.) What is your business? (either ask or note yourself)

3.) Why you choose to be in this kind of this business?

4.) For how long does your business already exist in this place?
   - [ ] 0 to 3 years
   - [ ] 4 to 8 years
   - [ ] longer than 8 years

5.) How many people work in your business (you are included)?
   - [ ] 1 to 3 people
   - [ ] 4 to 8 people
   - [ ] more than 8 people

6.) Where are they come from?

7.) How satisfied are you with your commercial success?
   - [ ] excellent
   - [ ] good
   - [ ] sufficient
   - [ ] bad
   - [ ] very bad

8.) According to you, Is there any eco-tourism in this area?

9.) According to you, How does (eco) tourism bring changes in the area?

10.) Give your opinion on how did urban dwellers invade this area through times?

11.) Is there any change in this area through times? (the building, spatial aspect, social aspect, economical aspect) Give your opinion about it.

12.) What is the basic infrastructure in the area? Give your opinion about it. What is the sanitation system used in this area?
Natural hazard questions

1. Is your business affected by one or more of the following natural hazards?
   - [ ] Floods
   - [ ] Earthquakes
   - [ ] Volcanic eruptions
   - [ ] Intense rain
   - [ ] None of them
   - [ ] Other: ____________

2. Are there any arrangements for protection of natural hazards in your kampung?
   - [ ] Yes, the arrangements protect my business
   - [ ] Yes, but the arrangements do not protect my business
   - [ ] No, but I would need some
   - [ ] No, but that is not needed anyway

3. How do you cope to any hazard occurrences? Is there any specific way to cope with hazard?
6.2 Appendix Surakarta

6.2.1 Questionnaire for the relocated families of Pucang Sawit

**ANGKET (Questionnaire)**

<table>
<thead>
<tr>
<th>Penduduk di Relokasi</th>
</tr>
</thead>
<tbody>
<tr>
<td>Interviewer ID: ____________________</td>
</tr>
<tr>
<td>Questionnaire ID: ____________________</td>
</tr>
<tr>
<td>Date: ____________________</td>
</tr>
</tbody>
</table>

Kami kelompok mahasiswa geografi dari UNS dan Universitas Innsbruck, Austria. Kami melaksanakan survei ini sebagai bagian dari kerjasama yang terjalir antar kedua universitas. Kami ingin mengumpulkan sejumlah fakta di lapangan serta mengetahui persepsi pribadi anda terkait dengan proses pemindahan dan tentang permukiman baru. Angket ini bersifat anonim. Terima kasih banyak atas bantuan anda menjawab pertanyaan berikut ini!

**Pertanyaan umum**

1. Sudah berapa tahun anda tinggal di sini (Ngemplak Sutan)? ________________

   *(How many years do you already live here in Majosang)*

   >>>>> Accuracy: One period maximum. If the value is > 6 → check again

2. Apakah Anda tinggal di Pucang Sawit sebelumnya?

   *(Did you live in Pucang Sawit?)*

   □ Ya (Yes )
   □ Tidak (No)

   *(Jika jawabannya “Tidak), langsung ke pertanyaan di Lampiran A If the answer is “No”, proceed to questions in ANNEX A

3. Menurut pendapat anda, apakah pemindahan permukiman ini memang perlu dilakukan?

   *(In your opinion, was the resettlement necessary?)*

   □ Ya, karena ____________________

   *(Yes, because...)*

   □ Tidak, karena ____________________

   *(No, because...)*

4. Apa manfaat yang anda harapkan dari program relokasi?

   *(What benefits did you expect from the relocation?)*

   ____________________

5. Apakah anda memperolehnya?

   *(Did you get these benefits?)*

   □ Ya, karena ____________________

   *(Yes, because...)*

   □ Tidak, karena ____________________

   *(No, because...)*

   □ Ya dan tidak, karena ____________________

   *(Yes and no, because...)*
Pertanyaan tentang rumah tangga dan anggaran rumah tangga
(Questions regarding the household and the household budget)

6. Berapa orang yang tinggal di rumah ini?________
   (How many people live in this house?)

7. Bandingkan pendapatan rumah tangga anda: Berapa pendapatan bulanan anda ketika anda tinggal di Mojosongo/Pucang Sawit?
   (Please compare your household income: What is/was your monthly household income in Mojosongo/Pucang Sawit?)
   
<table>
<thead>
<tr>
<th>Rupiah per month</th>
<th>Pucang Sawit</th>
<th>Mojosongo</th>
</tr>
</thead>
<tbody>
<tr>
<td>&lt; 400.000</td>
<td></td>
<td></td>
</tr>
<tr>
<td>400.000 – 800.000</td>
<td></td>
<td></td>
</tr>
<tr>
<td>800.000 – 1.150.000</td>
<td></td>
<td></td>
</tr>
<tr>
<td>1.150.000 – 1.500.000</td>
<td></td>
<td></td>
</tr>
<tr>
<td>1.500.000 – 2.000.000</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2.000.000 – 2.500.000</td>
<td></td>
<td></td>
</tr>
<tr>
<td>&gt; 2.500.000</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

8. Bandingkan pengeluaran rumah tangga anda: Berapa pengeluaran bulanan anda ketika anda tinggal di Mojosongo/Pucang Sawit?
   (Please compare your household expenditures: What are/were your monthly household expenditures in Mojosongo/Pucang Sawit?)
   
<table>
<thead>
<tr>
<th>IDR per month</th>
<th>Pucang Sawit</th>
<th>Mojosongo</th>
</tr>
</thead>
<tbody>
<tr>
<td>&lt; 400.000</td>
<td></td>
<td></td>
</tr>
<tr>
<td>400.000 – 800.000</td>
<td></td>
<td></td>
</tr>
<tr>
<td>800.000 – 1.150.000</td>
<td></td>
<td></td>
</tr>
<tr>
<td>1.150.000 – 1.500.000</td>
<td></td>
<td></td>
</tr>
<tr>
<td>1.500.000 – 2.000.000</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2.000.000 – 2.500.000</td>
<td></td>
<td></td>
</tr>
<tr>
<td>&gt; 2.500.000</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

9. Apakah ada perubahan dalam pendapatan atau pengeluaran rumah tangga anda? Jika ya, mengapa? (If your household income changed, why?)

   __________________________________________

10. Apakah anda atau anggota keluarga anda ada yang kehilangan pekerjaan atau ganti pekerjaan karena relokasi ini?
    (Did you or any other household member loose or change your job due to the relocation?)
    ☐ Ya ☐ Tidak
    (Yes) (No)

11. Jika ya, mengapa hal tersebut bisa terjadi?
    (If yes, what are the main reasons for that change?)
    >>>>>>> Multiple responses (variables: 1 = tick or 0= NO tick)
    ☐ Sulitnya menuju tempat kerja
    (Bad access to the original place of work)
    ☐ Peluang kerja baru
    (New work opportunity)
    ☐ Ongkos transport yang terlalu mahal ke tempat kerja sebelumnya.
    (Too high travel costs to the original place of work)
    ☐ Kekurangan kendaraan pribadi
    (Lack of own means of transport)
    ☐ dll (Other): ____________________________
**Pertanyaan tentang kondisi rumah**  
*(Questions regarding the house)*

12. **Apakah anda melakukan modifikasi rumah anda sejak pindah ke sini?**  
*(Did you make any modifications to your house since moving in?)*

- [ ] Tidak, saya tidak melakukan modifikasi  
- [ ] Ya, saya melakukan modifikasi  

*Jika jawaban anda “ya”, apa saja itu?:*

*(If your answer is „Yes”, please specify)*

- [ ] pembangunan beranda/teras  
- [ ] penambahan pengaman  
- [ ] pembangunan partis/sekat  

*(constructed a porch)*  
*(enlargement)*  
*(Security measures)*  
*(constructed a partition)*  

- [ ] (other): __________________

13. **Apa yang ingin anda lakukan dengan rumah ini dalam waktu lima tahun ke depan?**  
*(What is your strategy in the next five years?)*

- [ ] Saya ingin tinggal di sini  
- [ ] Saya ingin menyewakannya  
- [ ] Saya ingin menjualnya  

*(I want to stay in the house)*  
*(I want to rent it out)*  
*(I want to sell it)*

- [ ] Strategi yang lain: __________________  

*(different strategy)*

14. **Jika anda ingin pindah? Apa alasannya?**  
*(if you don’t want to stay, why?)*

*Not willing to tell why -> 999*

**Pertanyaan terkait dengan kepemilikan**  
*(Questions regarding the nature of ownership)*

15. **Apakah rumah tersebut milik anda sendiri, atau anda menyewanya dari orang lain?**  
*(Do you rent or own the house you are living in?)*

<table>
<thead>
<tr>
<th></th>
<th>Sewa</th>
<th>Milik Sendiri</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pucang Sawit</td>
<td>[ ]</td>
<td>[ ]</td>
</tr>
<tr>
<td>Mojosongo</td>
<td>[ ]</td>
<td>[ ]</td>
</tr>
</tbody>
</table>

16. **Apakah anda atau pemilik tanah memiliki sertifikat tanah yang menjadi tempat anda tinggal?**  
*(Do/Did you or your landlord possess an official land certificate for the house you are/were living in?)*

<table>
<thead>
<tr>
<th></th>
<th>Sertifikat tanah</th>
<th>Tanpa sertifikat tanah</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pucang Sawit</td>
<td>[ ]</td>
<td>[ ]</td>
</tr>
<tr>
<td>Mojosongo</td>
<td>[ ]</td>
<td>[ ]</td>
</tr>
</tbody>
</table>
### Pertanyaan terkait dengan infrastruktur (Questions regarding the infrastructure)

17. Bagaimana persepsi anda terhadap hal-hal berikut ini dibandingkan dengan keadaan di permukiman lama?

<table>
<thead>
<tr>
<th>Akses lebih buruk (access is worse)</th>
<th>Akses lebih baik (access is better)</th>
<th>sama (same)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Persediaan makanan (Food supply)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Layanan kesehatan (Medical care)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Transportasi umum (Public transportation)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Tempat kerja (Place of work)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Lembaga Pendidikan (Educational institution)</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### Pertanyaan terkait dengan relokasi (Questions regarding the relocation)

18. Apakah keluarga anda diikutsertakan dalam keputusan relokasi?

- [ ] Ya
- [ ] Tidak (No)

19. Apakah keluarga anda dilibatkan dalam proses perencanaan permukiman kembali?

- [ ] Ya (Yes)
- [ ] Tidak (No)

20. Dapatkah keluarga anda mengajukan permintaan dalam kaitan dengan permukiman kembali?

- [ ] Ya (Yes)
- [ ] Tidak (No)

21. Apakah anda puas dengan proses relokasi ini?

- [ ] Sangat tidak (very unsatisfied)
- [ ] Kurang (unsatisfied)
- [ ] Sedikit (satisfied)
- [ ] Ya, sangat (very satisfied)

22. Mengapa?

(Why?)

__________________________________________________________________________

__________________________________________________________________________

__________________________________________________________________________

23. Adakah yang perlu diperbaiki dari proses relokasi ini? Apakah itu?

(is there anything you would improve in the relocation process?)

__________________________________________________________________________

__________________________________________________________________________

__________________________________________________________________________
## Pertanyaan terkait dengan persepsi
(Questions regarding the perception)

### 24. Perbandingan antara kedua daerah: Mana yang lebih baik?
(Comparing the two regions: Where is/was (...)better?)

<table>
<thead>
<tr>
<th>(...)</th>
<th>Pucang Sawit</th>
<th>Mojosongo</th>
<th>Sama (same)</th>
<th>Tidak tahu (don’t know)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Lokasi rumah</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>(The location of the house)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Kualitas rumah</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>(The quality of the house)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Ukuran rumah</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>(The size of the house)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Keamanan dari tindak kejahatan</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>(The security in terms of criminality)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Keamanan dari bahaya alam</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>(The security in terms of natural hazards)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>The access to persediaan makanan</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>(The access to food supply)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Akses ke tempat ibadah</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>(The access to places of worship)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Persediaan air</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>(The water supply)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Persediaan listrik</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>(The electricity supply)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Pembuangan sampah</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>(The waste disposal)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Sistem pembuangan air limbah</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>(The sewage system)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Fasilitas sanitasi</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>(The sanitary facilities)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Kehidupan sosial</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>(The social life)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### 25. Mana yang lebih baik? lokasi lama (Mojosongo) atau lokasi baru (Pucang Sawit)?
(Is the new (Mojosongo) or the old place (Pucang Sawit) better for living?)

- [ ] ...Lokasi baru (Mojosongo)
  (...old life situation)
- [ ] ...Lokasi lama (Pucang Sawit)
  (...new life situation)

Terima kasih atas bantuan anda !!
(Thank you for your help!!)
LAMPIRAN A: HANYA JIKA JAWABAN NOMOR 2 = TIDAK

This annex includes questions ONLY for newly arrived inhabitants (see filter question 2 = NO)

Pertanyaan terkait dengan kepemilikan
(Questions regarding the nature of ownership)

26. Apakah rumah ini milik anda sendiri, atau menyewa dari orang lain?
(Do you rent or own the house you are living in?)

Permukiman lama  Sewa  Milik sendiri
Mojosongo

27. Apakah anda atau pemilik tanah memiliki sertifikat tanah yang menjadi tempat anda tinggali?
(Do/Did you or your landlord possess an official land certificate for the house you are/were living in?)

Permukiman lama  Sertifikat tanah  Tanpa sertifikat tanah
Mojosongo

28. Apakah anda melakukan modifikasi rumah anda sejak pindah ke sini?
(Did you make any modifications to your house since moving in?)

☐ Tidak, saya tidak melakukan modifikasi  ☐ Ya, saya melakukan modifikasi
(No, I did not make any modifications)  (Yes, I did make modifications)

28.1 Jika jawabannya "ya", apa itu?
(If your answer is “Yes”, please specify)

☐ pembangunan beranda  ☐ perluasan bangunan
(constructed a porch)  (enlargement)
☐ penambahan pengaman  ☐ pembuatan partisi/sekat
(Security measures)  (constructed a partition)
☐ dll (other):

29. Apa yang ingin anda lakukan dengan rumah ini dalam waktu lima tahun ke depan?
(What is your strategy in the next five years?)

☐ saya ingin tetap tinggal di rumah ini  ☐ saya ingin menyewakannya  ☐ saya ingin
(I want to stay in the house)  (I want to rent it out)  (I want to sell it)

☐ Strategi yang lain: __________________________
(other)

29.1 Jika tidak ingin tinggal, apa alasannya?
(If you don’t want to stay, why?)

________________________________________

218
Urban Resilience in Indonesia

<table>
<thead>
<tr>
<th>Pertanyaan tentang infrastruktur (Questions regarding the infrastructure)</th>
</tr>
</thead>
<tbody>
<tr>
<td>30. Bagaimana persepsi anda terhadap hal-hal berikut ini bila dibandingkan dengan keadaan di permukiman lama?</td>
</tr>
<tr>
<td>(How do you perceive the access to the following items’ compared to the old settlement?)</td>
</tr>
<tr>
<td>Persediaan makanan (Food supply)</td>
</tr>
<tr>
<td>Layanan kesehatan (Medical care)</td>
</tr>
<tr>
<td>Transportasi umum (Public transportation)</td>
</tr>
<tr>
<td>Tempat kerja (Place of work)</td>
</tr>
<tr>
<td>Lembaga Pendidikan (Educational institution)</td>
</tr>
</tbody>
</table>

31. Tahukah anda bahwa Ngemplak Sutan adalah permukiman relokasii?  
(Do you know that Mojosongo is a relocation area?)

☐ Ya (Yes)  ☐ Tidak (No)

32. Menurut anda, apakah permukiman kembali adalah sesuatu yang baik?  
(Do you think relocation is a good thing?)

☐ Ya (Yes)  ☐ Tidak (No)  ☐ Tidak tahu (Don’t know)

32.1 Mengapa demikian?  
(Why?)

________________________________________________________________________

________________________________________________________________________
<table>
<thead>
<tr>
<th>original phrase</th>
<th>statement 1</th>
<th>statement 2</th>
<th>category</th>
<th>category 2</th>
<th>assessment</th>
</tr>
</thead>
<tbody>
<tr>
<td>house very small, not comfortable, hot inside</td>
<td>worse house</td>
<td></td>
<td>House &amp; Infrastructure</td>
<td></td>
<td>-2</td>
</tr>
<tr>
<td>quality of the house is very poor, only rich people can improve the house</td>
<td>worse house</td>
<td></td>
<td>House &amp; Infrastructure</td>
<td></td>
<td>-2</td>
</tr>
<tr>
<td>because there is no more flood</td>
<td>no more flood</td>
<td></td>
<td>Natural Hazard / Security</td>
<td></td>
<td>-2</td>
</tr>
<tr>
<td>I have more security in terms of living condition</td>
<td>feel safer</td>
<td></td>
<td>Natural Hazard / Security</td>
<td></td>
<td>-2</td>
</tr>
<tr>
<td>house is smaller</td>
<td>worse house</td>
<td></td>
<td>House &amp; Infrastructure</td>
<td></td>
<td>-1</td>
</tr>
<tr>
<td>access is worse</td>
<td>worse access</td>
<td></td>
<td>Location</td>
<td></td>
<td>-1</td>
</tr>
<tr>
<td>the access to the main street is more difficult, because the house is in a valley</td>
<td>worse access</td>
<td></td>
<td>Location</td>
<td></td>
<td>-1</td>
</tr>
<tr>
<td>too crowded</td>
<td>too many people</td>
<td></td>
<td>Other</td>
<td></td>
<td>-1</td>
</tr>
<tr>
<td>certificate didn’t arrive yet</td>
<td>no certificate yet</td>
<td></td>
<td>Status / Government</td>
<td></td>
<td>-1</td>
</tr>
<tr>
<td>land certificate still in process</td>
<td>no land certificate yet</td>
<td></td>
<td>Status / Government</td>
<td></td>
<td>-1</td>
</tr>
<tr>
<td>because the building is not satisfied. Not fit to the promised building</td>
<td>building is not good</td>
<td></td>
<td>House &amp; Infrastructure</td>
<td></td>
<td>-1</td>
</tr>
<tr>
<td>the bad quality of the buildings</td>
<td>worse house</td>
<td></td>
<td>House &amp; Infrastructure</td>
<td></td>
<td>-1</td>
</tr>
<tr>
<td>the government should build more public facility</td>
<td>more infrastructure needed</td>
<td></td>
<td>House &amp; Infrastructure</td>
<td></td>
<td>1</td>
</tr>
<tr>
<td>no floodings</td>
<td>no more flood</td>
<td></td>
<td>Natural Hazard / Security</td>
<td></td>
<td>1</td>
</tr>
<tr>
<td>more independent, rent house is cheaper</td>
<td>more independence</td>
<td></td>
<td>Other</td>
<td></td>
<td>1</td>
</tr>
<tr>
<td>there is no other place to live</td>
<td>no other choice</td>
<td></td>
<td>Other</td>
<td></td>
<td>1</td>
</tr>
<tr>
<td>because the certificate not ready yet will get it, problem with government</td>
<td>got the house but no certificate</td>
<td></td>
<td>Status / Government</td>
<td></td>
<td>1</td>
</tr>
<tr>
<td>got the house but not yet a certificate</td>
<td>got the house but no certificate</td>
<td></td>
<td>Status / Government</td>
<td></td>
<td>1</td>
</tr>
<tr>
<td>house and certificate</td>
<td>got house and land certificate</td>
<td></td>
<td>Status / Government</td>
<td></td>
<td>1</td>
</tr>
<tr>
<td>income increased, size of house enlarged</td>
<td>increased income</td>
<td></td>
<td>Economic Situation / Costs</td>
<td>House &amp; Infrastructure</td>
<td>2</td>
</tr>
<tr>
<td>it doesn’t cost anything to move</td>
<td>no costs for moving</td>
<td></td>
<td>Economic Situation / Costs</td>
<td>House &amp; Infrastructure</td>
<td>2</td>
</tr>
<tr>
<td>because of electric and water access</td>
<td>improved technical infrastructure</td>
<td></td>
<td>House &amp; Infrastructure</td>
<td></td>
<td>2</td>
</tr>
<tr>
<td>it is so comfortable, she didn’t get money for improvement</td>
<td>better house</td>
<td></td>
<td>House &amp; Infrastructure</td>
<td></td>
<td>2</td>
</tr>
<tr>
<td>there is a sanitation, water supply is good</td>
<td>improved technical infrastructure</td>
<td></td>
<td>House &amp; Infrastructure</td>
<td></td>
<td>2</td>
</tr>
<tr>
<td>access is better (food, school)</td>
<td>better access</td>
<td></td>
<td>Location</td>
<td></td>
<td>2</td>
</tr>
<tr>
<td>no flood</td>
<td>no more flood</td>
<td></td>
<td>Natural Hazard / Security</td>
<td></td>
<td>2</td>
</tr>
<tr>
<td>no flood anymore</td>
<td>no more flood</td>
<td></td>
<td>Natural Hazard / Security</td>
<td></td>
<td>2</td>
</tr>
<tr>
<td>no flooding, land certificate</td>
<td>no more flood</td>
<td></td>
<td>got land certificate</td>
<td>Natural Hazard / Security</td>
<td>2</td>
</tr>
<tr>
<td>didn’t have a choice</td>
<td>no other choice</td>
<td></td>
<td>Other</td>
<td></td>
<td>2</td>
</tr>
<tr>
<td>no money to live at another place</td>
<td>no other choice</td>
<td></td>
<td>Other</td>
<td></td>
<td>2</td>
</tr>
<tr>
<td>because of the gift from the government</td>
<td>grateful to the government</td>
<td></td>
<td>Status / Government</td>
<td></td>
<td>2</td>
</tr>
<tr>
<td>get house with land certificate, no flooding, feel safe</td>
<td>got land certificate</td>
<td></td>
<td>Status / Government</td>
<td>Natural Hazard / Security</td>
<td>2</td>
</tr>
<tr>
<td>government helped to give land to build the house</td>
<td>grateful to the government</td>
<td></td>
<td>Status / Government</td>
<td></td>
<td>2</td>
</tr>
<tr>
<td>happy because she got a land certificate</td>
<td>got land certificate</td>
<td></td>
<td>Status / Government</td>
<td></td>
<td>2</td>
</tr>
<tr>
<td>house and certificate</td>
<td>got house and land certificate</td>
<td></td>
<td>Status / Government</td>
<td></td>
<td>2</td>
</tr>
<tr>
<td>I have land certificate</td>
<td>got land certificate</td>
<td></td>
<td>Status / Government</td>
<td></td>
<td>2</td>
</tr>
<tr>
<td>In Mbojongo have land certificate</td>
<td>got land certificate</td>
<td></td>
<td>Status / Government</td>
<td></td>
<td>2</td>
</tr>
<tr>
<td>land certificate, increasing wealth</td>
<td>got land certificate</td>
<td></td>
<td>increased income</td>
<td>Economic Situation / Costs</td>
<td>2</td>
</tr>
<tr>
<td>legal now</td>
<td>got land certificate</td>
<td></td>
<td>Status / Government</td>
<td></td>
<td>2</td>
</tr>
<tr>
<td>thankful to government, they have land and home, maybe home not too good, if not given house</td>
<td>got land certificate</td>
<td>worse house</td>
<td>Status / Government</td>
<td>House &amp; Infrastructure</td>
<td>3</td>
</tr>
<tr>
<td>original phrase</td>
<td>statement 1</td>
<td>statement 2</td>
<td>category</td>
<td>category 2</td>
<td>own assessment</td>
</tr>
<tr>
<td>--------------------------------------------------------------------------------</td>
<td>------------------------</td>
<td>------------------------</td>
<td>------------------------</td>
<td>------------</td>
<td>----------------</td>
</tr>
<tr>
<td>they should improve the public facility</td>
<td>improve infrastructure</td>
<td>House &amp; Infrastructure</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>yes, the house is not build properly, not a good condition of house</td>
<td>improve house</td>
<td>House &amp; Infrastructure</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>The process must be improved, because of time and more money from government</td>
<td>more time needed</td>
<td>improve process schedule</td>
<td>Process</td>
<td></td>
<td>-</td>
</tr>
<tr>
<td>No, because resolution process going fluently</td>
<td>no improvement</td>
<td>Process</td>
<td>-</td>
<td></td>
<td>-</td>
</tr>
<tr>
<td>the drainage system</td>
<td>improve infrastructure</td>
<td>House &amp; Infrastructure</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>they have to give better houses</td>
<td>improve house</td>
<td>House &amp; Infrastructure</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>no</td>
<td>no improvement</td>
<td>Process</td>
<td>-</td>
<td></td>
<td>-</td>
</tr>
<tr>
<td>the house, they get from the beginning was in a bad condition, better access</td>
<td>improve house</td>
<td>House &amp; Infrastructure</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>to the house and the road is very wide, but no good road</td>
<td>improve house</td>
<td>House &amp; Infrastructure</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>no toilets, too small because front door to the street, the size of the ground</td>
<td>improve house</td>
<td>House &amp; Infrastructure</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>improve distribution system of the house, no light in entrance because of the</td>
<td>improve house</td>
<td>House &amp; Infrastructure</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>The promised house &amp; different from the reality</td>
<td>improve house</td>
<td>House &amp; Infrastructure</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Another house that already has a path</td>
<td>improve house</td>
<td>House &amp; Infrastructure</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>no waste disposal</td>
<td>improve infrastructure</td>
<td>House &amp; Infrastructure</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>because the house still out of standard</td>
<td>improve house</td>
<td>House &amp; Infrastructure</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>nothing</td>
<td>no improvement</td>
<td>Process</td>
<td>-</td>
<td></td>
<td>-</td>
</tr>
<tr>
<td>keep premises</td>
<td>improve distribution</td>
<td>Process</td>
<td>-</td>
<td></td>
<td>-</td>
</tr>
<tr>
<td>to have a better quality of the house</td>
<td>improve house</td>
<td>House &amp; Infrastructure</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>government: must improve process, bigger house, more beautiful, care more about</td>
<td>improve house</td>
<td>House &amp; Infrastructure</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>safety, process in giving certificate</td>
<td>improve process schedule</td>
<td>Process</td>
<td>-</td>
<td></td>
<td>-</td>
</tr>
<tr>
<td>process is very good</td>
<td>no improvement</td>
<td>Process</td>
<td>-</td>
<td></td>
<td>-</td>
</tr>
<tr>
<td>she wants that government gives more care, especially for home-improvement</td>
<td>improve house</td>
<td>House &amp; Infrastructure</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>would like to have a bigger house</td>
<td>improve house</td>
<td>House &amp; Infrastructure</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>not enough green spaces</td>
<td>improve location</td>
<td>Location</td>
<td>-</td>
<td></td>
<td>-</td>
</tr>
<tr>
<td>would like to have constructed a porch</td>
<td>improve house</td>
<td>House &amp; Infrastructure</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>improvement of roof</td>
<td>improve house</td>
<td>House &amp; Infrastructure</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>designing the house should be observed by the authorities</td>
<td>improve process schedule</td>
<td>Process</td>
<td>-</td>
<td></td>
<td>-</td>
</tr>
<tr>
<td>nothing</td>
<td>no improvement</td>
<td>Process</td>
<td>-</td>
<td></td>
<td>-</td>
</tr>
<tr>
<td>it s necessary to have access to cleaner water</td>
<td>improve infrastructure</td>
<td>House &amp; Infrastructure</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>sanitation, safety, public facility</td>
<td>improve infrastructure</td>
<td>House &amp; Infrastructure</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>waste disposal must be improved, more trees</td>
<td>improve infrastructure</td>
<td>House &amp; Infrastructure</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>waste disposal, more trees</td>
<td>improve infrastructure</td>
<td>House &amp; Infrastructure</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>nothing</td>
<td>no improvement</td>
<td>Process</td>
<td>-</td>
<td></td>
<td>-</td>
</tr>
<tr>
<td>no, it is a good</td>
<td>no improvement</td>
<td>Process</td>
<td>-</td>
<td></td>
<td>-</td>
</tr>
<tr>
<td>yes, sanitation, house, water must be better</td>
<td>improve infrastructure</td>
<td>House &amp; Infrastructure</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>nothing</td>
<td>no improvement</td>
<td>Process</td>
<td>-</td>
<td></td>
<td>-</td>
</tr>
<tr>
<td>nothing</td>
<td>no improvement</td>
<td>Process</td>
<td>-</td>
<td></td>
<td>-</td>
</tr>
<tr>
<td>public transportation</td>
<td>improve infrastructure</td>
<td>House &amp; Infrastructure</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>nothing</td>
<td>no improvement</td>
<td>Process</td>
<td>-</td>
<td></td>
<td>-</td>
</tr>
<tr>
<td>model for works</td>
<td>improve infrastructure</td>
<td>House &amp; Infrastructure</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
</tbody>
</table>
6.2.4 Interview guideline for authorities and administration

**Interview Guideline 1: Authorities – Land Titles**

Interviewer: __________________________________________

Date / start / end: _______________________________________

Location: _____________________________________________

>>> ITALIC passages are comments for the interviewer only

We are from the University of Innsbruck and we do research here in Indonesia in context of the master study programme “Global Change and Regional Sustainability” offered by the Institute of Geography. Within the module “development research” we want to analyse the causes, the process and the impacts of Surakarta’s resettlement programme. Furthermore we want to know how successful this programme has been.

**Infos on land title register**

1. What different types of land titles are there in Indonesia?
2. What activities are there to “legalise” land titles?

**Involvement in relocation programmes**

3. How do land titles influence Surakartas relocation programme?
4. Do you think there are more people in Surakarta that need to be relocated?
   4.1. Do you think there is enough space for relocation areas in the city?
5. Are you involved in Surakartas relocation programme?
   5.1. How?
6. What kind of programmes/fundings etc. concerning the relocation have been issued by your department?
7. What other agencies cooperated with you in the relocation programme?
8. Did the resettled people support or oppose the legalization of land titles?
   (>>> NOT JUST Mojosongo)
9. How long took the legalization process for the land titles of one relocation community?
   (>>> EXAMPLE: Mojosongo)
10. Do you think the structure/coordination etc. of the relocation process could be improved? If so, in what way?

**Final questions:**

11. What is your personal opinion about the relocation programme?
   11.1. Is there any need for improving the relocation programme?
   11.2. What challenges do you see?
6.2.5 Interview guideline for local experts

**Interview Guideline 2: Local Experts**

Interviewer: ____________________________

Date / start / end: ____________________________

Location: ____________________________

>>> **ITALIC passages are comments for the interviewer only**

We are from the University of Innsbruck, Austria, and we do research here in Indonesia in context of the master study programme "Global Change and Regional Sustainability" offered by the Institute of Geography. Within the module “development research” we want to analyse the causes, the process and the impacts of Surakarta’s resettlement programme. Furthermore we want to know how successful this programme has been.

We are especially interested in the relocation from Pucangswit to Mojosongo.

**Introductory questions (pembukaan)**

- What is your opinion about the relocation from Pucangswit to Mojosongo?
  
  **Bagaimana pendapat anda tentang program relokasi dari Pucangswit ke Mojosongo?**

- Do you feel threatened or encouraged by the relocation programme?
  
  **Apakah anda merasa khawatir dengan program ini?**

- How often has your RW/RT/area been affected by floodings in the last 10 years?
  
  **Bberapa kali dalam 10 tahun terakhir ini RT tempat anda tinggal terkena banjir?**

  >>> **If affected:**
  
  Would you like to be relocated as well?
  
  **Apakah anda juga mau direlokasi?**
  
  - If yes, why? (jika ya, mengapa?)
  
  - If no, why not? (jika tidak, mengapa?)

**Knowledge about & participation in relocation programme (Pengetahuan dan Partisipasi dalam program relokasi)**

- Why do you think has Surakarta initiated a relocation programme?
Menurut anda, apa alasan pemerintah kota Surakarta menjalankan program reloksasi?

- Do you think the resettlement has improved the life of the resettled people?
  (Menurut anda, apakah program relokasi ini memperbaiki kehidupan massyarakat yang direlokasi?)

- Do you think Surakarta city should relocate more (flood affected) communities?
  (Menurut anda, perlukan kota Surakarta merelokasi masyarakat-masyarakat lain yang terkena banjir?)

- Have you been involved in the relocation process?
  (Apakah anda terlibat dalam proses relokasi?)
    - If yes, how? (Jika ya, bagaimana?)

- Which other departments, NGOs, communities etc. have been involved in the relocation process? Could you please make a sketch?
  (Adakah lembaga lain yang terlibat dalam proses relokasi tersebut? Siapa saja? Maukah anda menggambarkanya?)

  - What were their tasks?
    (Apa tugas mereka masing-masing)

- Who decided on the current use of the area (as a park)?
  (Siapa yang memutuskan penggunaan area (taman, tanaman buah) ini?)

>>> indicate area on the map
(tunjukkan dalam peta)

- Have you been involved in this decision?
  (Apakah anda terlibat dalam pengambilan keputusan terkait dengan penggunaan area ini?)
    - If yes, how? (jika ya, bagaimana?)
    - If no, would you have been interested in? (Jika tidak, apakah anda tertarik untuk terlibat?)
• Do you think the structure/coordination etc. of the relocation process could be improved?
  (Menurut anda, apakah koordinasi atau pengorganisasian dalam proses relokasi ini perlu
diperbaikan?)
  ○ If so, in what way? (jika ya, bagaimana caranya?)

**Impact on own RW/RT/area (Dampak yang ditimbulkan pada wilayah RT)**

• What advantages/disadvantages had the resettlement for you?
  (Apa untung dan ruginya program relokasi ini bagi anda?)
  ○ Have you lost access to important technical or social infrastructure (e.g. kindergarten, wells
etc.) due to the relocation?
    (Apakah karena adanya program relokasi ini, kemudian anda kehilangan akses ke sarana
dan prasarana yang ada di wilayah ini?)

• For what kind of activities do you use this area now?
  (Kegiatan apa yang sekarang ini anda lakukan di wilayah ini?)
  ○ How often do you use this area per week?
    (Berapa kali per minggu anda menggunakan taman ini?)

• Do you like the park?
  (Anda suka taman ini?)

>>> Indicate park on map

(Tunjukkan tamannya di dalam peta)

• Would you prefer another use of this area?
  (Apakah anda menginginkan wilayah ini digunakan untuk keperluan lain?)
  ○ If yes, would you contribute financially etc. to have this other use?
    (Jika ya, apakah anda akan membantu membantunya? Apa bentuk bantuannya?)

• Has the resettlement caused any changes in your RW/RT/area?
  (Apakah wilayah RT anda berubah setelah adanya program relokasi ini?)
  ○ Have changes in technical & social infrastructure been caused by the resettlement in your
  RW/RT/area?
    (Adakah perubahan sarana dan prasarana di wilayah anda setelah program ini
dijalankan?)

**Final question (Pertanyaan penutup)**

• Do you think the situation in your area has improved through the resettlement?
  (Menurut anda, apakah situasi di daerah anda mengalami perbaikan setelah adanya program
  relokasi?)