

The Roman Impact on the Economy of the Lower Germanic Limes Region

Impact of Empire

ROMAN EMPIRE, C. 200 B.C.–A.D. 476

Edited by

Olivier Hekster

(Radboud University, Nijmegen, The Netherlands)

Editorial Board

Stéphane Benoist

Lien Foubert

Marietta Horster

Anne Kolb

Luuk de Ligt

Elio Lo Cascio

Bernhard Palme

Michael Peachin

Francisco Pina Polo

Rubina Raja

Christian Witschel

Greg Woolf

VOLUME 48

The titles published in this series are listed at *brill.com/imem*

The Roman Impact on the Economy of the Lower Germanic Limes Region

By

Erik Timmerman



BRILL

LEIDEN | BOSTON

Cover illustration: A depiction of the *vallus* on a second century AD bas-relief found at Buzenol.
Image courtesy of the Musée Gaumais

The Library of Congress Cataloging-in-Publication Data is available online at <https://catalog.loc.gov>
LC record available at <https://lccn.loc.gov/2023034016>

Typeface for the Latin, Greek, and Cyrillic scripts: "Brill". See and download: brill.com/brill-typeface.

ISSN 1572-0500

ISBN 978-90-04-68220-7 (hardback)

ISBN 978-90-04-68221-4 (e-book)

Copyright 2024 by Erik Timmerman. Published by Koninklijke Brill NV, Leiden, The Netherlands.
Koninklijke Brill NV incorporates the imprints Brill, Brill Nijhoff, Brill Schöningh, Brill Fink, Brill mentis,
Brill Wageningen Academic, Vandenhoeck & Ruprecht, Böhlau and V&R unipress.
Koninklijke Brill NV reserves the right to protect this publication against unauthorized use. Requests for
re-use and/or translations must be addressed to Koninklijke Brill NV via brill.com or copyright.com.

This book is printed on acid-free paper and produced in a sustainable manner.

*To the memory of my grandparents,
Hendrik and Bouwina Havinga*



Contents

Acknowledgements	XI
List of Figures and Tables	XIII

1 Introduction	1
1.1 The Debate about Roman Economic Growth	3
1.2 This Book's Contribution	16
2 Setting the Stage	22
2.1 The Natural Landscape	22
2.2 The Pre-Roman Economy	28
2.3 Conclusions	31
3 The Roman Impact	33
3.1 The Roman Army	33
3.2 Urbanisation	39
3.3 Population Growth	43
3.4 Roman Institutions	50
3.4.1 <i>Taxation</i>	50
3.4.2 <i>Monetisation</i>	52
3.4.3 <i>Standardisation</i>	60
3.5 Infrastructure	62
3.6 Conclusions	69
4 Agricultural Production	72
4.1 Long-Term Developments	75
4.2 The Villa Landscape	77
4.2.1 <i>Arable Farming</i>	78
4.2.2 <i>Animal Husbandry</i>	80
4.2.3 <i>Surplus Production</i>	82
4.3 The Non-villa Landscapes	86
4.3.1 <i>Arable Farming</i>	87
4.3.2 <i>Animal Husbandry</i>	87
4.3.3 <i>Surplus Production</i>	94
4.4 Conclusions	97

5	Non-agricultural Production	102
5.1	Extractive Industries	107
5.1.1	<i>Wood</i>	108
5.1.2	<i>Stone</i>	115
5.1.3	<i>Metal</i>	123
5.1.4	<i>Conclusions</i>	129
5.2	Manufacturing	130
5.2.1	<i>Ceramics</i>	132
5.2.1.1	Military Production	134
5.2.1.2	Civilian Production	136
5.2.1.3	Ceramic Building Material	147
5.2.2	<i>Glass</i>	151
5.2.3	<i>Metal</i>	157
5.2.4	<i>Conclusions</i>	161
6	Trade	164
6.1	Amphorae	167
6.2	Terra sigillata	183
6.3	Trade with Other Regions	193
6.4	The Traders	196
6.5	Conclusions	200
7	Living Standards	204
7.1	Housebuilding	207
7.2	Portable Material Culture	214
7.2.1	<i>Metal Objects</i>	214
7.2.2	<i>Pottery</i>	222
7.3	Conclusions	227
8	Final Conclusions	230
8.1	Synthesis	230
8.2	Interpretation	235
8.3	Future Research	238
	Appendix 1	241
	Appendix 2	255
	Appendix 3	260

Sources and Bibliography	263
Shapefiles	263
Websites	263
Literary sources	263
Epigraphic sources	264
Bibliography	265
Index of Geographical Names	315
Index of Subjects	317

Acknowledgements

This book is an improved version of the PhD thesis I defended at the Faculty of Arts and Humanities of the University of Cologne in June 2021. I look back on my time in Cologne with much fondness and good memories, and I am thankful for the many friendly and inspiring people that I have met along the way. It is therefore a pleasure for me to thank some of them here.

First of all, my *Doktorvater*, Peter Franz Mittag. He always stood ready to discuss my work with him, but he also knew how to keep me on my toes with his critical questions. I also greatly appreciate the encouragement he gave me when I was struggling with my research at times. This has kept me on the right track. My thanks also go to my second supervisor, Eckhard Deschler-Erb. From him, I learned a lot about provincial Roman archaeology, and my work has greatly benefited from the friendly discussions that I had with him. I am also very grateful to Wim Jongman. He introduced me to Roman economic history during my studies in Groningen and has inspired me with his great enthusiasm for the topic. He taught me a lot and gave me the confidence to start doing research. He has also been a great help in formulating the research questions for this book.

I consider myself very fortunate to have been a member of the *DFG Graduiertenkolleg 1878. Archäologie vormoderner Wirtschaftsräume*. My time in the 'Grako' has been a great and valuable experience. I have gained many new insights, and my work has certainly profited from the many good discussions and lectures that we had. At the same time, the social aspect was of great importance. Whether it was a plenum, an international workshop, or just an evening of drinks, we always had lots of fun. I would therefore like to thank everyone who was involved in the Grako. More specifically, I would like to thank Ina Borkenstein, who was the coordinator of the Grako. She always made sure that everything was taken care of, which has made our lives much easier. A word of thanks also goes to Tymon de Haas, who was the leader of our research line. The discussions I had with him have really helped me better plan and structure my research. Of course, I would also like to thank my colleagues in the office, Dean Peeters, Cathalin Recko, and Ella Hetzel, for the many good conversations and the sociability.

A very big thank you also goes to David Brough. Not only was he a great drinking buddy at the Limes Congress in Serbia, but he also proofread the whole manuscript for me. I would also like to thank Caroline van Toor, who has checked the Latin in this work for me.

I am also thankful to the editors of *Impact of Empire* for accepting my book in this series and to the people at Brill for their fine cooperation and good guidance during the publication process. The anonymous reviewer also made an important contribution to this work by providing useful feedback.

Furthermore, there are several people who I would like to thank for a variety of things, such as helping with my research proposal, sharing (unpublished) work and data, allowing me to reproduce figures, or providing useful literature and bibliographies: Barbara Borgers, Bert Groenewoudt, Gijs Tol, Julia Hoffmann-Salz, Maaïke Groot, Marion Brüggler, Paul Beliën, Peter Attema, Philip Verhagen, Rahel Otte, Sebastian Held, Stijn Heeren, Thomas Frank, Tyler Franconi, and Vince Van Thienen.

Finally, I want to thank my parents for the love, support, and opportunities they have always given me. And last, but certainly not least, my sweet girlfriend Franziska. Her love, support, and patience helped me a lot in writing this book.

Erik Timmerman

Figures and Tables

Figures

- 1 The Lower Germanic Limes region with the main locations and features mentioned in the text 23
- 2 Central places (military and civilian) that were in existence in the Lower Germanic Limes region in the Roman period 34
- 3 The total number of soldiers stationed along the Lower Germanic Limes 36
- 4 The development of the number of urban settlements in the Lower Germanic Limes region 42
- 5 Estimated population densities in the German Rhineland per km² 44
- 6 Estimated population densities in the Dutch part of the MDS region per km² 45
- 7 The chronological development of rural settlements in the six subregions of the Lower Germanic Limes region 47
- 8 The number of stray coin finds in the Roman Netherlands 54
- 9 The locations where the coins from Figure 8 were found 55
- 10 Important features of the Roman infrastructure network in the Lower Germanic Limes region 65
- 11 Dated wood remains from western Germany in absolute numbers 110
- 12 The percentage distribution of dated finding spots of wooden archaeological objects 111
- 13 Dated wood finds from the Dutch River Area and Dutch coastal area 113
- 14 Estimated number of yearly produced millstones in the Eifel quarries near Mayen 118
- 15 The number of dated pottery kilns that have been found in the Lower Germanic Limes region 136
- 16 Distribution of settlements where pottery kilns have been documented 138
- 17 Sites where Roman period glass production has been documented 153
- 18 Sites where Roman period metal production has been documented 159
- 19 The distribution of the dated terra sigillata stamps that have been found in the Lower Germanic Limes region 185
- 20 The total number of dated terra sigillata stamps per 25-year period, divided by region of origin 186
- 21 The total number of dated terra sigillata stamps from military contexts per 25-year period, divided by region of origin 190
- 22 The total number of dated terra sigillata stamps from civilian contexts per 25-year period, divided by region of origin 191

- 23 The total number of dated metal objects that have been collected in the PAN-database in 50-year periods 215
- 24 The distribution of the metal objects collected in the PAN-database and dated within the Roman period 217
- 25 The development of the number of metal objects in specific rural settlements 219
- 26 The development of average proportions of handmade and wheel-thrown pottery in 10 rural settlements 224
- 27 The sites that were used for Figure 26 and Table 15 225

Tables

- 1 Available space for surpluses in rural granaries 84
- 2 The relative proportions of animal species in rural settlements from the western Dutch river delta 88
- 3 The relative proportions of animal species in rural settlements from the Dutch River Area 89
- 4 The relative proportions of animal species in Tiel-Passewaaij 92
- 5 Amphorae from the Hunerberg (19–12 BC), MNI (n=31) 171
- 6 Amphorae from the Kops Plateau (12 BC–AD 69), MNI (n=654) 172
- 7 Amphorae from Neuss, fortifications 1–4 (16 BC–AD 16), sherds (n=936) 173
- 8 Amphorae from Neuss, fortifications 5–6 (AD 16–43), sherds (n=1608) 173
- 9 Amphorae from Xanten Ostmauer (Augustus–AD 50), sherds (n=2498) 177
- 10 Amphorae from Xanten Hafengrabung (Nero–second century AD), sherds (n=420) 178
- 11 Amphorae from Xanten Insula 15 (late first–second centuries AD), sherds (n=746) 178
- 12 Amphorae from Xanten Insula 39 (Trajan–mid third century AD), sherds (n=3794) 178
- 13 Amphorae from Bonn (second–third centuries AD), sherds (n=4075) 180
- 14 Amphorae from Braives (first–fourth centuries AD), MNI (n=146) 182
- 15 The percentages of handmade vessels in pottery assemblages from 10 different rural settlements 226