
Preface

This book is the first systematic summary of the volcanic geoheritage of the western margin of the Arabian Peninsula. In general volcanism is not commonly associated with the Arabian Peninsula, and rarely linked to the Kingdom of Saudi Arabia as being a country that is rich in volcanic sites worth to visit. This book hopefully will change this preconception as it will take the reader to a volcanic wonderland that can be traced over thousands of kilometres length in a several hundreds of kilometres wide belt that is aligned parallel with the present day coastline of the Red Sea. While this book provides a summary of the Cenozoic to Recent volcanic features located in the territory of the Kingdom of Saudi Arabia, these volcanoes are part of a much larger volcanic system that is probably the largest intracontinental volcanic province on Earth stretching from the southern regions of Eastern Turkey through Syria, Jordan from the north across the Kingdom of Saudi Arabia and ending in Yemen in the south. In this aspect this intracontinental volcanic province is comparable in size to the region commonly referred in the mainstream scientific literature as being the largest Cenozoic intracontinental volcanic region on Earth in eastern Australia. Especially the western regions of the Kingdom of Saudi Arabia host numerous volcanic fields that are called traditionally as harrats or volcanic lava fields—a synonym for volcanic fields—largely unknown to many of the global geological community. As these volcanic fields are located in arid climate and the majority of them were formed in the last 10 millions of years with several Quaternary eruption sites, the volcanic landforms are preserved exceptionally well. This book intend to provide the first systematic inventory of the volcanic geoheritage values of these unknown sites with an aim to provide scientific basis for future research and utilization of the geoheritage values of these volcanic regions.

The core of the book is a detailed description of the Harrat Rahat that is one of the largest volcanic fields in Saudi Arabia that hosts two well-documented historic eruption sites with well-preserved volcanic landforms with high geodiversity. The fresh volcanic appearance of Harrat Rahat is evident for any visitor. The region is also located in a culturally and religiously important triangle between Al Madinah, Makkah and Jeddah. As this region hosts one of the youngest volcanic eruption sites in the western Arabian Peninsula, this area got strong scientific attention from the early 1960s till today, hence a wealth of scientific knowledge were available to evaluate and catalogue the volcanic geoheritage values of the field. In addition since 2011, an international collaboration project between the King Abdulaziz University, Auckland University and Massey University focused on the Volcanic Risks in Saudi Arabia (VORiSA) and conducted several new researches to understand the volcanism in this region. This period also provided numerous opportunities to access volcanic sites that have not been studied before making a strong scientific basis to evaluate geoheritage values of this region realistically. This project leads for the first time to consider the northern part of Harrat Rahat, formally called as Harrat Al Madinah to be considered as the first volcanic geopark in the Kingdom of Saudi Arabia. In this respect the volcanic geoheritage values of Harrat Rahat became the backbone of this book.

In addition in this book we tried to sum up the current knowledge of the volcanic geoheritage of other regions in the Kingdom of Saudi Arabia. As the size of the region and their individual harrats are huge, and many of them have rarely been visited in the past, it was not an aim during the preparation of this book to be able to provide a well-balanced and in-depth inventory for every volcanic regions of the Kingdom of Saudi Arabia. We were focusing only on those areas where at least a single field campaign was arranged since 2011 and there were enough external data to be able to evaluate preliminarily the volcanic geoheritage values of those regions. As building a volcanic geoheritage inventory is an ongoing process, we hope that this book will provide a strong head start to demonstrate the high volcanic geodiversity the Kingdom of Saudi Arabia.

This book starts with an introduction where basic concepts of geoheritage studies are outlined with various definitions especially the way how these concepts and definitions are used throughout the book. A geological setting provides a simple but clear summary of the geological context of the Cenozoic volcanism of the Kingdom of Saudi Arabia. The main part of the book provides a step-by-step summary of the main geoheritage concepts of the main volcanic harrats of the region. Each chapter provides a summary of the basic concepts the volcanic geoheritage values of the specific harrats define prior a detailed inventory style summary of individual geosites and geotopes are provided. The book consists of two main parts; one of them is dedicated to Harrat Rahat, while the other chapter summarizes the volcanic geoheritage values of the Harrat Khaybar, Harrat Kishb, Harrat Hutaymah and Harrat al Birk. These are the harrats that have been studied from volcanic geoheritage perspective so far. Other harrats such as those located close to the northern regions close to the Syrian and Iraqi border to the Kingdom has not been studied in detail and currently accessing them is not easy. Other important harrats such as the Harrat Lunayyir which hosted a volcano-seismic unrest in 2009 has not been studied so far, as prior the event in 2009, the region was considered a fairly remote and unknown volcanic region that has not been included in volcanic geoheritage studies recently.

Overall we offer this book to anyone who would like to expand their horizons on volcanic regions so far been hidden from many people's eyes. This book can be used as a guide to locate the sites and plan geotourism or provide it for tour operators who can use it to design their own geotouristic and geoeducational programmes. This book also can be very useful for other geoheritage researchers either in the Kingdom of Saudi Arabia or elsewhere to follow techniques on how to create an inventory for volcanic geoheritage values of a region. The book can be a great help to develop future geoparks in the region as well as use the identified geotopes and geosites to scale and evaluate geopark projects elsewhere. We also hope that this book will be a main push to initiate a concentrated geoheritage work on the region to be able to propose the western Saudi Arabian intracontinental volcanic province as a unique and the largest volcanic province in intracontinental settings on Earth for the UNESCO World Heritage status.

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