Environmental Conservation (2015) **42** (1): 73–83 © Foundation for Environmental Conservation 2014 doi:10.1017/S0376892914000034

Research agendas for the sustainable management of tropical peatland in Malaysia

RORY PADFIELD[1]*, SUSAN WALDRON[2], SIMON DREW[2], EFFIE PAPARGYROPOULOU[1], SHASHI KUMARAN[3], SUSAN PAGE[4], DAVE GILVEAR[5], ALONA ARMSTRONG[2], STEPHANIE EVERS[6], PAUL WILLIAMS[7], ZURIATI ZAKARIA[1], SING YUN CHIN[8], SUNE BALLE HANSEN[9], AHIMSA CAMPOS-ARCEIZ[10], MOHD TALIB LATIF[11], ALEX SAYOK[12] AND MUN HOU THAM[1]

[1]*Malaysia Japan International Institute of Technology, Universiti Teknologi Malaysia, Kuala Lumpur 54100, Malaysia,* [2]*School of Geographical and Earth Sciences, University of Glasgow, Glasgow G12 8QQ, UK,* [3]*Research Institute for Environment and Livelihoods, Charles Darwin University, Darwin NT 0909, Australia,* [4]*Department of Geography, University of Leicester, Leicester LE1 7RH, UK,* [5]*Faculty of Science and Environment, Portland Square Building, Drake Circus, Plymouth PL4 8AA, UK,* [6]*School of Biosciences, University of Nottingham Malaysia Campus, Semenyih, Selangor Darul Ehsan 43500, Malaysia,* [7]*Institute for Global Food Security, Queen's University Belfast, David Keir Building, Malone Road, Belfast BT9 5BN, Northern Ireland, UK,* [8]*Global Environment Centre, Petaling Jaya, Selangor 47300, Malaysia,* [9]*UTM Palm Oil Research Center, Universiti Teknologi Malaysia, Kuala Lumpur 54100, Malaysia,* [10]*School of Geography, University of Nottingham Malaysia Campus, Semenyih, Selangor Darul Ehsan 43500, Malaysia,* [11]*School of Environmental and Natural Resource Sciences, Faculty of Science and Technology, Universiti Kebangsaan Malaysia, 43600 Bangi, Selangor, Malaysia, and* [12]*Institute of Biodiversity and Environmental Conservation, Universiti Malaysia Sarawak, 94300 Kota Samarahan, Sarawak, Malaysia*

Date submitted: 5 August 2013; Date accepted: 7 January 2014; First published online 6 February 2014

SUMMARY

There is a need for coordinated research for the sustainable management of tropical peatland. Malaysia has 6% of global tropical peat by area and peatlands there are subject to land use change at an unprecedented rate. This paper describes a stakeholder engagement exercise that identified 95 priority research questions for peatland in Malaysia, organized into nine themes. Analysis revealed the need for fundamental scientific research, with strong representation across the themes of environmental change, ecosystem services, and conversion, disturbance and degradation. Considerable uncertainty remains about Malaysia's baseline conditions for peatland, including questions over total remaining area of peatland, water table depths, soil characteristics, hydrological function, biogeochemical processes and ecology. More applied and multidisciplinary studies involving researchers from the social sciences are required. The future sustainability of Malaysian peatland relies on coordinating research agendas via a 'knowledge hub' of researchers, strengthening the role of peatlands in land-use planning and development processes, stricter policy enforcement, and bridging the divide between national and provincial governance. Integration of the economic value of peatlands into existing planning regimes is also a stakeholder priority. Finally, current research needs to be better communicated for the benefit of the research community, for improved societal understanding and to inform policy processes.

*Correspondence: Dr Rory Padfield Tel: +60 1366 32037 e-mail: rorypadfield@gmail.com

Keywords: Malaysia, research agendas, sustainable management, stakeholder engagement, tropical peatland

INTRODUCTION

There is growing international recognition of the important ecosystem services played by peatland environments, such as potable water supply (Rosli *et al.* 2010; Silvius & Suryadiputra 2010), biodiversity (Page *et al.* 2012) and carbon storage (Billett *et al.* 2010; Page *et al.* 2011*a*, *b*; Moore *et al.* 2013). This increased recognition is reflected in a surge of policies and initiatives to maintain the integrity of peat across temperate and tropical peat zones. Initiatives such as the Association of South East Asian Nations' (ASEAN) Peatland Management Strategy (ASEAN Secretariat 2007) and International Union for Conservation of Nature's (IUCN) Commission of Inquiry on Peatlands, UK (Bain *et al.* 2011), and country-wide policies such as the Scottish Soil Framework (Scottish Government 2009) and national greenhouse gas (GHG) emission reduction plans for Indonesian peat (IIPC [International Indonesian Peatland Conversation], unpublished data 2013) illustrate the intent of policy makers to address past perceptions and inappropriate peatland management practices. Despite this, the maintenance and status of the world's peatlands is a matter of considerable concern (Wösten *et al.* 1997; Page *et al.* 2006, 2009*a*; Parish *et al.* 2008; Yule 2010) with ongoing uncertainties on the most appropriate management practices and a lack of consensus over the best way forward.

To date, peatland research has strongly focused on boreal and temperate peats, with important knowledge developments in aspects such as peatland function and characteristics (see for example Heikurainen & Päivänen, 1970; Hogg *et al.* 1992; Bonnett *et al.* 2006), and management techniques for