

5 MOVING BEYOND BOUNDARIES IN THE PURSUIT OF SUSTAINABLE PROPERTY LAW

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5.1 INTRODUCTION

New Zealand scholars Prue Taylor and David Grinlinton state that it is “often the rules of property law, modified by planning and resource management regulation, that most directly govern human interaction with the natural environment.”¹ Despite the importance of property law as a component in the system of regulation of our natural resources, consideration of how property law should be reformed in the transition to sustainability is a relatively fledgling topic for analysis.² This, perhaps, should not be surprising. Realisation of the scale and extent of the global challenges facing the Earth’s resources has occurred only relatively recently whereas, at least in Europe, the tradition of property law reaches back to Antiquity. However, it is difficult to ignore that global projects aimed at tracking and evaluating the state of our natural environment are producing increasingly dire warnings about the impact of humanity on the planet as well as emphasising the magnitude of the transformation required to ensure that we live within the Earth’s resources.³ The growing awareness of environmental issues since the 1970’s provides the context for the emergence of the concept of “sustainable development” as a key organising principle for governance and regulation. The phrase “sustainable development”, although a highly contested concept, has been defined as “development that meets the needs of the present without compromising the ability of future generations to meet their own needs”⁴ and comprises the three pillars

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1 P. Taylor and D. Grinlinton, “Property Rights and Sustainability: Towards a New Vision of Property” in D. Grinlinton and P. Taylor (eds), *Property Rights and Sustainability: The Evolution of Property Rights to Meet Ecological Challenges* (2011) p. 9.

2 See citations at fn 92 below.

3 See World Wide Fund for Nature, “Living Planet Report – 2018: Aiming Higher” (2018) and Intergovernmental Panel on Climate Change, “Global Warming of 1.5 °C: An IPCC Special Report on the Impacts of Global Warming of 1.5 °C Above Pre-Industrial Levels and Related Global Greenhouse Gas Emission Pathways” (2018) for just two examples.

4 World Commission on Environment and Development, “Our Common Future” (1987) Ch. 2.1. Available here: www.un-documents.net/ocf-02.htm (last accessed 11 Jun 2019).

of economic development, social justice and environmental protection.⁵ To reach the goal of sustainability, and to ensure the protection and preservation of our natural resources, it is necessary to review our systems of regulation and consider how our laws should be reformed in light of the global challenges we are facing. Property law will not escape the critical eye of the law reformer in this process.

In this chapter, I consider the reform of property rights regarding water, otherwise known as private water rights, in the context of sustainability. Reflecting the global trend, there are mounting, urgent, multi-dimensional challenges facing water which threaten this vital resource. In the World Wide Fund for Nature's Living Planet Report 2018 it was stated: "Freshwater habitats, such as lakes, rivers and wetlands, are the source of life for all humans yet they are also the most threatened, strongly affected by a range of factors including habitat modification, fragmentation and destruction; invasive species; overfishing; pollution; disease and climate change."⁶ Water has also been noted as being at the core of sustainable development.⁷ I will explore the interactions between three different policy spheres, which relate to the reform of private water rights – each representing a pillar of sustainable development – in the particular context of small-scale hydro-schemes in Scotland. I argue that this micro-analysis has macro-implications, and that this case study shows that we must move beyond multiple boundaries in reforming our property laws in order to contribute to the transition to sustainability.

5.2 CURRENT LAW OF PRIVATE WATER RIGHTS

Before discussing three policy spheres, which impact on reform of private water rights, it is necessary to outline the current law in Scotland. Until recently, the law of private water rights was, like much of Scots law, obscure and under-researched. In the book *Private Water Rights*,⁸ I undertook a comprehensive review of this area of law from a historical perspective and set out the principles and rules of the modern law. A central tenet of the law of private water rights in Scotland is that running water is among the *res communes*.⁹ This means running water is categorised as incapable of private ownership due to its inherent nature and characteristics. As a result, in principle, running water is open to the use of all and the only right that anyone has to water is to appropriate portions of this

5 See generally J. Blewitt, *Understanding Sustainable Development* (3rd edn, 2017).

6 World Wide Fund for Nature, "Living Planet Report – 2018: Aiming Higher" (2018) p. 7.

7 United Nations World Water Assessment Programme, "The United Nations World Water Development Report 2015: Water for a Sustainable World" (2015), Foreword by M. Jarraud, Chair of UN-Water and Secretary-General of WMO p. vi.

8 J. Robbie, *Private Water Rights* (2015).

9 *Ibid.*, paras. 2-78-2-90.

resource, this being a public right.¹⁰ Those with water running through their lands, however, have the best opportunity to exercise this public right.¹¹

The fact that running water is among the *res communes* does not mean that there is complete freedom for landowners to abstract all the water in a river. If a river runs between several different plots of land, the landowners cannot materially interfere with flow of the river unless for primary purposes – these being drinking, washing, cooking and other requirements of a self-sufficient piece of land.¹² Each landowner along a river has a right to prevent any material interference with the natural flow of water for non-primary purposes and this results in a corresponding obligation on everyone, but particularly other landowners, not to interfere with this right. This network of reciprocal rights and obligations is a highly restrictive system of rules that arises by operation of law and is an aspect of the ownership of the land through which water runs. These private law rights are unaffected by any public law licences such as a Controlled Activities Regulations licence, discussed further below, obtained by the landowner.¹³ The doctrine providing this regulation is called common interest.¹⁴ These private rights are the “private water rights” I refer to in this chapter. This phrase is unsatisfactory as these rights are not rights *to* the water but merely *regarding* water.¹⁵ Common interest rights are real rights held by one landowner in another’s land rather than a right to appropriate the water, which as noted above is a public right. However, the phrase “private water rights” most immediately conveys the subject of discussion. These common interest rights crucially only arise when the ownership of a piece of land containing a river is split between several owners. If there is a river, which is wholly contained in one tract of land, the landowner is generally not restricted by common interest rights of others.¹⁶

The law of private water rights became settled in the 18th and 19th centuries in Scotland.¹⁷ A significant contributing factor to the evolution of the restrictive rules of common interest was the effect of industry on water use and availability during the Industrial Rev-

10 *Ibid.*, para. 2-80.

11 It is difficult to place the conception of water in Scotland within the framework of private, public, common and open-access property. Although being outwith private ownership in its natural state, there are limitations on its appropriation. This reflects Tony Arnold’s comment that “[d]istinctions among private property, public property, common property, and nonproperty are merely for conceptual convenience and do not reflect the actual reality that most – perhaps all – property regimes are mixed regimes.” C.A. Arnold, “Sustainable Webs of Interests: Property in an Interconnected Environment” in D. Grinlinton and P. Taylor (eds), *Property Rights and Sustainability: The Evolution of Property Rights to Meet Ecological Challenges* (2011) p. 171.

12 J. Robbie, *Private Water Rights* (2015) para. 7-36.

13 *Ibid.*, para. 7-71.

14 *Ibid.*, Ch. 7.

15 *Ibid.*, para. 1-08.

16 *Ibid.*, para. 7-19.

17 *Ibid.*, Ch. 6.

olution. Although water-powered mills had a long history in Scotland,¹⁸ with the beginning of the Industrial Revolution, water became an increasingly contested resource with industries such as brewing and distilling beginning to consume significant quantities of water.¹⁹ There was also a demand for a centralised water supply due to increasing urbanisation, as water in the existing public wells in towns and cities was often insufficient or polluted.²⁰ In Chadwick's *Report on the Sanitary Condition of the Labouring Population of Great Britain* of 1842, lack of clean water was identified as a chief cause of the various cholera, typhus and tuberculosis epidemics across Britain.²¹ There is evidence in the reported cases of this time that the use of water for primary purposes and industrial purposes often clashed such as when water was used for cooling steam engines and this then resulted in water shortages, or where use of water for a distillery, brewery or dye-works resulted in the pollution of rivers used for drinking, cooking and washing.²² Judges acknowledged these conflicting uses of water and gave judgments against industry with comments such as "since there are evils, we should admit those only which are necessary: dwelling houses cannot be avoided, but manufactures may."²³ It is within this context that the natural flow principle outlined above was developed and became established.

The natural flow principle was finally settled in the case of *Morris v Bicket*²⁴ of 1864, with other rules being contained in a patchwork of older case law. The strict requirements of the law mean that the consent of all affected landowners along the river needs to be obtained to use water for any purposes which are commercial, agricultural or industrial. Unlike the law of England, there is no reasonableness requirement when considering what a landowner is entitled to do with the water running through her land.²⁵ However, the level of restriction is largely arbitrary and depends on the number of plots of land in separate ownership through which a river runs. The sources of the law of private water rights mean it is inaccessible to many and the particular historical origin of the rules suggest that the law should now be reviewed in light of modern concerns. Indeed, in 2014, the Land Reform Review Group, when considering this area of law in light of the recent reforms to the general regulatory framework governing water resources in Scotland,²⁶ identified common

18 *Ibid.*, para. 5-05.

19 *Ibid.*, para. 6-02.

20 *Ibid.*, para. 6-04.

21 E. Chadwick, *Report on the Sanitary Condition of the Labouring Population of Great Britain* (1842; reprinted M.W. Flinn (ed.), 1965, p. 4.

22 J. Robbie, *Private Water Rights* (2015) para. 6-51.

23 *Russell v Haig* (1791) Bell's Octavo Cases 338 at p. 347 (Lord Swinton).

24 *Morris v Bicket* (1864) 2 M 1082 (aff'd (1866) 4 M (HL) 44).

25 J. Robbie, *Private Water Rights* (2015) paras 7-14-7-17.

26 Including the Water Industry (Scotland) Act 2002, Water Environment and Water Services (Scotland) Act 2003, Water Services (Scotland) Act 2005, Flood Risk Management (Scotland) Act 2009 and Water Resources (Scotland) Act 2013.

interest as a doctrine requiring reform in order to “reflect the public interest in these resources as now defined”.²⁷

5.3 TENSIONS IN PRIVATE WATER RIGHTS REFORM

Although there are clear justifications for a review of the law of private water rights in Scotland, it is less obvious exactly how the law should be reformed. When considering reform of areas or institutions of property law, it is commonplace to focus on creating a doctrinally coherent and consistent system of rules, which fits with the principles of property law or private law in general. Stability and certainty are the goals. When examining water rights, however, it is evident that the factors to be considered in a reform process must be broader than those typically accommodated by doctrinal analysis. There are multiple functions which water plays in Scotland such as in providing a wholesome domestic supply to the general public, in growing food and within agriculture, in significant commercial purposes such as the whisky industry and supporting fish farms, for sporting and recreational activities as well as to sustain a diverse flora and fauna.²⁸ There are also a number of significant policy objectives, which could inform the reform of private water rights including protecting human health and wellbeing, maintaining biodiversity, tackling climate change and supporting the Scottish economy. In the following paragraphs, I will focus on and discuss three policy spheres that are influencing the operation of small-scale hydro-schemes to generate electricity. This analysis serves as a case study, which leads to greater claims regarding how to conduct research and implement property law reform to contribute to the transition to sustainability. The fact that there are conflicting policy objectives that require to be considered is more immediately obvious in relation to water rights reform than in other areas of property law. However, there are many barriers in doctrinal property law analysis, which will be outlined below, which result in the multifarious policy objectives that should influence property rules remaining unseen and unexplored.

5.3.1 *Economic Development: Scotland as a Hydro-Nation*

The Scottish Government is currently committed to making Scotland a “Hydro-Nation”.²⁹ A Hydro-Nation is one where “water resources are developed so as to bring maximum

27 Land Reform Review Group, “The Land of Scotland and the Common Good” (2014) para 30.13. Available here: www.gov.scot/Resource/0045/00451087.pdf (last accessed 11 Jun 2019).

28 See the discussion in Scottish Government, “Building a Hydro Nation – A Consultation” (Dec 2010).

29 See Scottish Government, “Scotland the Hydro-Nation: Annual Report 2018” (Sep 2018).

benefit to the Scottish economy”.³⁰ The Scottish Government states this is being done to fulfil the duty on the Scottish Ministers in the Water Resources (Scotland) Act 2013 to “take such reasonable steps as they consider appropriate for the purpose of ensuring the development of the value of Scotland’s water resources”.³¹ Renewable energy is part of this agenda and, in 2011, the Scottish Government set the target of the amount of electricity generated through renewable sources (as a percentage of gross consumption) to increase to 100% by 2020.³² Of course, Scotland’s ambitious target must be viewed in light of the target set by the European Union (EU) under the Renewable Energy Directive of 2009 for 20% of the EU’s total energy needs to be generated by renewable sources by 2020.³³ Within this framework, the UK has the target of 15% of all energy and 30% of electricity to be generated by renewables by 2020.³⁴ In 2017, hydro-power accounted for 11.4% of primary renewables production in the EU member states.³⁵ Future development of hydro-power will be important to reaching the EU’s energy targets. However, as the sites for medium to large scale hydro-schemes have mostly been developed, the focus has now turned to small-scale hydro-schemes.³⁶

In the Scottish Government’s “2020 Routemap for Renewable Energy in Scotland”, it was noted that in addition to reduction in carbon emissions and providing future energy security, by 2020 the renewables industry could provide up to 40,000 jobs and £30bn investment to the Scottish economy.³⁷ Small-scale hydro-power is a component in this industry. Although definitions of small-scale hydro differ, a generally accepted definition in Europe is that a small-scale hydro-scheme is one, which has an output of up to 10

30 See the statement on the Scottish Government website. Available here: <https://beta.gov.scot/policies/water/hydro-nation/> (last accessed 11 Jun 2019).

31 Water Resources (Scotland) Act 2013 s1(1)(a). However, in this section, value expressly includes monetary or non-monetary value, s1(3)(a).

32 Scottish Government, “2020 Routemap for Renewable Energy in Scotland” (2011) p. 4.

33 Directive 2009/28/EC of the European Parliament and of the Council of 23 April 2009 on the promotion of the use of energy from renewable sources (OJ 2009 L 140). In Dec 2018, a revised renewable energy directive (2018/2011/EU) entered into force which establishes a new renewable energy target for the EU of 32% by 2030.

34 Department of Energy and Climate Change, “National Renewable Energy Action Plan for the UK” (Jul 2010). The extent to which energy policy will change following Brexit is, as is much concerning Brexit, a matter of considerable uncertainty. See A Reid, “Brexit: Energy Policy” SPICe Briefing (Nov 2016).

35 See EU’s Eurostat website: Renewable Energy Statistics. Available here: https://ec.europa.eu/eurostat/statistics-explained/index.php/Renewable_energy_statistics#Renewable_energy_produced_in_the_EU_increased_by_two_thirds_in_2007-2017 (last accessed 11 Jun 2019).

36 D. Anderson, H. Moggridge, P. Warren and J. Shucksmith, “The impacts of ‘run-of-river’ hydropower on the physical and ecological condition of rivers” (2015) 29 *Water and Environment Journal* 268 at p. 268. There are also environmental objections to large-scale hydro-schemes mentioned below.

37 Scottish Government, “2020 Routemap for Renewable Energy in Scotland” (2011) p. 4. The Scottish Government’s “Scottish Energy Strategy: The Future of Energy in Scotland” (Dec 2017) p. 76 states that in 2015, the renewable and low carbon technologies sector supported an estimated 58,000 jobs and generated a turnover of £10.5bn.

megawatts (MW), this being enough to power up to 10,000 homes.³⁸ A report commissioned by the Scottish Government in 2009 suggested that, at the time, up to a further 1200 MW of economically viable, small-scale hydro-power was potentially available in Scotland.³⁹ This report, however, needs to be reviewed in light of the negative changes since 2015 to Feed-in Tariffs and the subsequent closure of this subsidy by the UK Government, which has affected the viability of such schemes.⁴⁰ Despite these reforms, new schemes continue to be commissioned and constructed including, for example, a recently completed 2 MW scheme in Kinlochewe,⁴¹ a scheme on the Allt Choille Rais which generates energy for Nevis Range⁴² and the 4 MW Glasa scheme in Easter Ross which recently received planning permission.⁴³

There has been significant progression towards the Scottish Government's renewable energy target. In 2016, Scotland generated 54% of its electricity needs from renewable sources, which is four times greater than the level in 2000.⁴⁴ The percentage is ever increasing.⁴⁵ Although this increase is largely attributable to onshore wind, small-scale hydro has also contributed to this figure.⁴⁶ In 2017, the Scottish Government set the new target of 50% of the energy for Scotland's heat, transport and electricity to be generated from renewable sources by 2030 in the "Scottish Energy Strategy: The Future of Energy in Scotland".⁴⁷ This again should be viewed against the background of an update to the EU's targets of at least 27% of the EU's total energy to be produced by renewable sources by 2030.⁴⁸ In introducing the new target, the Scottish Government noted that hydropower

38 T. Abbasi and S.A. Abbasi, "Small hydro and the environmental implications of its extensive utilization" (2011) 15 *Renewable and Sustainable Energy Reviews* 2134 at p. 2136. See also the guide provided by engineering firm Renewables First: www.renewablesfirst.co.uk/hydropower/hydropower-learning-centre/what-is-the-difference-between-micro-mini-and-small-hydro/ (last accessed 11 Jun 2019).

39 N. Wallace and J. Wallace, "The Employment Potential of Scotland's Hydro Resource" (2009). Available here: www.gov.scot/Resource/Doc/299322/0093327.pdf (last accessed 11 Jun 2019).

40 See Pöyry, "Analysis of Costs of Small-Scale Hydro and Implied Feed-in Tariffs" (2015). Available here: www.scottishrenewables.com/publications/analysis-costs-hydro-and-implied-fits-poyry-report/ (last accessed 11 Jun 2019); Department for Business, Energy & Industrial Strategy, "The Feed-In Tariffs Scheme: Government Response" (Dec 2018).

41 "Corks pop for Scottish hydro" (7 Sept 2017) <http://renews.biz/108398/corks-pop-for-scottish-hydro/> (last accessed 11 Jun 2019).

42 "New hydro scheme powers Scottish mountain resort" (23 Oct 2017) www.nevisrange.co.uk/hydro-completion-ceremony/ (last accessed 11 Jun 2019).

43 "Highland blessing for Innogy hydro" (7 Nov 2018) <https://renews.biz/49931/highland-blessing-for-innogy-hydro/> (last accessed 11 Jun 2019).

44 Scottish Government "Scottish Energy Strategy: The Future of Energy in Scotland" (Dec 2017) p. 21.

45 Scottish Government, "Energy Statistics for Scotland: Q4 Figures" (March 2019). Available here: www2.gov.scot/Resource/0054/00547118.pdf (last accessed 11 Jun 2019).

46 Scottish Government "Scottish Energy Strategy: The Future of Energy in Scotland" (Dec 2017) p. 21.

47 *Ibid.*, at p. 7.

48 European Commission, "2030 Energy Strategy" (2014). Available here: <https://ec.europa.eu/energy/en/topics/energy-strategy-and-energy-union/2030-energy-strategy> (last accessed 11 Jun 2019).

“has a long and illustrious history in Scotland which can continue, with small-scale hydro playing an important role in our economy and our energy mix as we make the transition into a low carbon future.”⁴⁹ The Scottish Government also confirmed that it remains committed to helping the hydro industry overcome the challenges it has faced in recent years.⁵⁰

Encouraging the construction and operation of more small-scale hydro-schemes creates the possibility of disputes and the private water rights system in Scotland does little to support many hydro-schemes along the course of one river due to its restrictive rules. As a hydro-scheme will inevitably interfere with the natural flow of the river, a landowner who wishes to set up a hydro-scheme will have to obtain the consent of the other affected landowners along the river.⁵¹ Such consent may not be forthcoming particularly where the operation of existing hydro-schemes may be affected. Indeed, the early development of the rules of common interest in the 17th and 18th centuries in Scotland was in response to disputes in the courts between various mill owners along rivers.⁵² Therefore, to support the renewable energy industry and the economic benefits it brings, greater flexibility in the law of private water rights would be required to allow more opportunities for the harnessing of this particular source of energy.

5.3.2 *Social Justice: Land for the Many and not the Few*

How does supporting small-scale hydro-power fit with the other objectives that the Scottish Government is pursuing? The land reform agenda in Scotland has recently been a much discussed topic.⁵³ Central to this agenda is the strengthening of the rights of communities to compulsorily acquire land. In 2013, the Scottish Government stated its aim for one million acres of land to be in community ownership by 2020.⁵⁴ In December 2017, there were approximately 547,691 acres in community ownership.⁵⁵ Reforms being implemented to fulfil this aim include Part 4 of the Community Empowerment (Scotland) Act 2015 giving communities the right to buy abandoned, neglected or detrimental land and Part 5 of the Land Reform (Scotland) Act 2016 which gives communities the right to buy land

49 Scottish Government, “Scottish Energy Strategy: The Future of Energy in Scotland” (Dec 2017) at p. 50.

50 *Ibid.*

51 J. Robbie, *Private Water Rights* (2015) para. 7-71.

52 *Ibid.*, Ch. 5.

53 See, for example, A. Wightman, “Scottish land reform is on the agenda. And the rest of the UK should take note” (25 Jun 2015) Available here: www.theguardian.com/commentisfree/2015/jun/25/scottish-land-reform-bill (last accessed 11 Jun 2019). See generally Land Reform Review Group, “The Land of Scotland and the Common Good” (2014).

54 See generally Scottish Government, “One Million Acres by 2020” (2015).

55 See Scottish Government, “Estimate of Community Owned Land in Scotland 2017 – Revised Tables – Summary Note” (Dec 2018) p. 1.

to further sustainable development. The Scottish Land Fund⁵⁶ and Empowering Communities Fund⁵⁷ both provide access to funding for communities seeking to purchase land.

A driving force behind these reforms is the idea that Scotland's land is in the hands of too few people due to the claim that 432 private landowners own 50% of the private land in rural Scotland,⁵⁸ and the changes are also fuelled by a desire for greater community empowerment. However, to connect this policy with the renewable energy targets, large landowners, working with developers, are often in the best position to have renewable energy projects on their land. There are many reasons for this: owners of large estates can make decisions about the use of their land without needing to negotiate a consensus like communities; landowners and developers may already have an established relationship; developers often have access to finance; landowners and developers often have a relationship with experienced legal and technical advisers; and, perhaps most importantly for present purposes, landowners may own a tract of land large enough that they will require few or no private law agreements with other owners, for example, along the river for the development of a hydro-scheme.⁵⁹ Therefore, large landowners can effectively by-pass the private water rights constraints. These multiple factors result unsurprisingly in the statistic that in June 2016, 41% of the current operational capacity of renewable energy installations was on farms and estates in Scotland. This is the greatest single share of renewable energy. By contrast, only 11% was community owned.⁶⁰

Connecting the land reform agenda with the renewables agenda, it is possible that the successful implementation of land reform policy, which is often argued as an issue of social justice in allowing more people access to land ownership, could potentially impact on the development of small-scale hydro-power. The existing private water rights system in Scotland would contribute to this. As soon as the ownership of a large area of land is fragmented by communities exercising their rights to buy, each section of land carries with it a right to object to any interference with the natural flow of a river, making the successful

56 See here: www.gov.scot/policies/land-reform/scottish-land-fund/ (last accessed 11 Jun 2019).

57 See here: www.gov.scot/policies/community-empowerment/empowering-communities-fund/ (last accessed 11 Jun 2019).

58 Land Reform Review Group, "The Land of Scotland and the Common Good" (2014) para. 24.1. The claim that the concentration of land ownership is a barrier to sustainable development in Scotland must be viewed in light of the report by S. Thomson et al, "The impact of diversity of ownership scale on social, economic and environmental outcomes: exploration and case studies" (Mar 2016). This report concluded (at p. 1) that "it is too simplistic to conclude that scale of land ownership is a significant factor in the sustainable development of communities". Available here: www.gov.scot/publications/impact-diversity-ownership-scale-social-economic-environmental-outcomes/ (last accessed 11 Jun 2019).

59 Many of these challenges are identified a report commissioned by the Scottish Government by D Roberts and A McKee, "Exploring Barriers to Community Land-Based Activities" (2015). Available here: www.gov.scot/Resource/0048/00485806.pdf (last accessed 11 Jun 2019).

60 Scottish Government, "Energy in Scotland 2017" at p. 13. Other owners are local authorities and housing associations.

establishment of a new hydro-scheme more difficult. This would be an example of the tragedy of the anti-commons where numerous right-holders prevent the effective management of a single asset.⁶¹ Further, communities, understandably, often wish to acquire areas of land containing natural resources such as rivers in order to, among other things, operate their own renewable energy schemes. Indeed, this is being encouraged by the Scottish Government, which has an aim to have 1 gigawatt (GW) of community and locally-owned renewable energy by 2020 and 2 GW by 2030.⁶² Support to communities is provided by the Community Renewable Energy Scheme,⁶³ which has resulted in successful projects like the 400 kilowatt Garmony hydro-scheme on the Isle of Mull.⁶⁴

Consideration of the interaction between the renewable energy and land reform agendas in the context of small-scale hydro-schemes raises the possibility that reform of private water rights should also be considered as part of the land reform agenda, as suggested by the Land Reform Review Group.⁶⁵ As with renewable energy policy, the land reform policy aims would be consistent with creating more flexibility in the private water rights system in order to give a larger range of groups the opportunity to benefit from hydro-power. This would allow two economic and social justice goals relevant to private water rights to be pursued simultaneously.

5.3.3 *Environmental Protection: Are Hydro-schemes Really Green?*

There are, however, not only the social justice and economic aspects of private water rights reform to consider but also environmental protection. As noted above, hydro-power is often promoted as a “green” source of energy and important in the transition to renewable energy production. Whilst it is true that hydro-schemes produce carbon-free electricity, hydro-schemes can have considerably damaging environmental consequences.⁶⁶ It is now well-established that large-scale hydro-power projects have a number of adverse environmental, as well as social, effects resulting from the fundamental disruption to the river and its ecosystem, which needs to take place to implement them. Effects include degradation in water quality, increased siltation, increased numbers of disease carrying insects (such

61 M. A. Heller, “The Tragedy of the Anticommons: Property in the Transitions from Marx to Markets” (1998) 111 Harv Law Review 621.

62 Scottish Government, “Scottish Energy Strategy: The Future of Energy in Scotland” (Dec 2017) p. 43.

63 See here: www.localenergy.scot/funding/ (last accessed 11 Jun 2019).

64 See here: www.localenergy.scot/projects-and-case-studies/case-studies/community-owned/garmony-hydro/ (last accessed 11 Jun 2019).

65 See fn 27 above.

66 For an overview of the development of environmental controls of hydro-schemes in Scotland see C.T. Reid, A. Pillai and A.R. Black, “The Emergence of Environmental Concerns: Hydroelectric Schemes in Scotland” (2005) 17(3) *Journal of Environmental Law* 361.

as mosquitoes) and damage to fish populations.⁶⁷ It is often assumed that small-scale hydro-schemes are more environmentally friendly when compared with large-scale schemes.⁶⁸ This assumption was until relatively recently untested. Recent studies have, however, shown that even small-scale hydro-schemes can have significant negative consequences on the river ecosystem.⁶⁹ Indeed, there may also be cumulative effects where many small-scale hydro-schemes are positioned along one river.⁷⁰

The Scottish Government is aware of the potentially negative environmental effects of hydro-schemes and in 2010 issued a policy statement regarding the balancing of benefits of renewables generation and protection of the water environment which stated that “in order to optimise the potential for hydropower generation emphasis will be placed on supporting hydropower developments which can make a significant contribution to Scotland’s renewables targets whilst minimising any adverse impacts on the water environment.”⁷¹ There are a number of regulatory controls in place to establish and minimise the potential environmental impacts of a proposed hydro-scheme. When setting up a hydro-scheme in Scotland, the promoter of the scheme will need to obtain planning permission from the local authority.⁷² As part of that, an environmental impact assessment (EIA) may need to be prepared if the project is likely to have significant effects on the environment by virtue of factors such as its natural, size or location.⁷³ An EIA report must consider any significant effects of the project on, among other things, biodiversity and in particular

67 T. Abbasi and S.A. Abbasi, “Small hydro and the environmental implications of its extensive utilization” (2011) 15 *Renewable and Sustainable Energy Reviews* 2134 at p. 2135.

68 *Ibid.*, at p. 2136.

69 See for example, T Abbasi and S A Abbasi, “Small hydro and the environmental implications of its extensive utilization” (2011) 15 *Renewable and Sustainable Energy Reviews* 2134; T.H. Bakken et al, “Development of small versus large hydropower in Norway – comparison of environmental impacts” (2012) *Energy Procedia* 185; D. Anderson, H. Moggridge, P. Warren and J. Shucksmith, “The impacts of ‘run-of-river’ hydropower on the physical and ecological condition of rivers” (2015) 29 *Water and Environment Journal* 268; R. Brackley, “Interactions between migrating salmonids and low-head hydropower schemes” (2016) Unpublished PhD Thesis, University of Glasgow. A recent article also indirectly links declining salmon populations to the rise of watermills in rivers across Europe through use of historical data, see H J R Lenders et al, “Historical rise of waterpower initiated the collapse of salmon stocks” (2016) *Scientific Reports* 6: 29269.

70 D Fraser, I Palmer and I Stewart-Russon, “Cumulative effects of hydropower schemes on fish migration and populations” (2015) *Environment Agency Report*.

71 Scottish Government, “Balancing the Benefits of Renewables Generation and Protection of the Water Environment” (Jan 2010). Available here: www.gov.scot/publications/balancing-the-benefits-of-renewables-with-protecting-the-water-environment/ (last accessed 11 Jun 2019).

72 Under the *Town and Country Planning (Scotland) Act 1997*. Over 50 MW, consent is granted by the Scottish Ministers under section 36 of *Electricity Act 1989*.

73 As required under the *Town and Country Planning (Environmental Impact Assessment) (Scotland) Regulations 2017/102*.

species and habitats protected under the EU Habitats Directive and Birds Directive.⁷⁴ Separately, the promoter of the scheme will also need a public law licence for interference with the water environment such as the abstraction and impoundment of water required as part of the hydro-scheme and also for temporary works undertaken through construction. This is a Controlled Activities Regulations (CAR) licence, which is granted by the Scottish Environmental Protection Agency (SEPA).⁷⁵ These regulatory requirements were enacted to fulfil Scotland's obligations under the EU Water Framework Directive and the Environmental Impact Assessment Directive.⁷⁶

When deciding whether to grant the CAR licence, SEPA considers what the effect of any proposed scheme will have on plant and animal life. It is possible to predict a hydro-scheme will have negative environmental consequences but SEPA can nevertheless grant a licence if it considers the social and economic impacts of a scheme outweigh the environmental impact.⁷⁷ If a scheme will cause harm, SEPA has the power to impose conditions on the licence, which is granted in order to mitigate the negative effects of the scheme.⁷⁸ However, with the volume of licences that SEPA grants, it is difficult to ensure compliance with all licence conditions. SEPA has a compliance assessment scheme in order to target the highest risk and most poorly performing sites but of course this does not ensure complete compliance or prevent unlicensed activities taking place.⁷⁹ As a result, there can be environmental disasters such as when the operations for the Inverinian 1.5 MW hydro-scheme on the River Lyon killed fresh water pearl mussels in a large and actively breeding colony in 2010 due to silt from the hydro-scheme construction clogging up the river.⁸⁰ The freshwater pearl mussel is a priority species in Scotland and the UK,⁸¹ a protected

74 Town and Country Planning (Environmental Impact Assessment) (Scotland) Regulations 2017/102 reg 4(3)(b); Council Directive 1992/43/EEC on the conservation of natural habitats and of wild fauna and flora; Directive 2009/147/EC of the European Parliament and of the Council on the conservation of wild birds.

75 Regulated by the Water Environment (Controlled Activities) (Scotland) Regulations 2011.

76 Directive 2000/60/EC of the European Parliament and of the Council establishing a framework for the Community action in the field of water policy (OJ 2000 L 327); Directive 2011/92/EU of the European Parliament and of the Council on the assessment of the effects of certain public and private projects on the environment (OJ 2012 L 26) as amended by Directive 2014/52/EU of the European Parliament and of the Council amending Directive 2011/92/EU on the assessment of the effects of certain public and private projects on the environment.

77 Scottish Environmental Protection Agency, "Guidance for Developers of Run-of-River Hydropower Schemes" (2015) p. 4. Available here: www.sepa.org.uk/media/383805/guidance_for_developers_of_run_of_river_hydropower_schemes.pdf (last accessed 11 Jun 2019).

78 Water Environment (Controlled Activities) (Scotland) Regulations 2011 reg. 8(1).

79 SEPA, "Compliance Assessment Scheme Guidance Manual" (Jul 2018).

80 See "Firm directors admit killing endangered pearl mussels" (15 February 2013). Available here: www.heraldscotland.com/news/13092332.Firm_directors_admit_killing_endangered_pearl_mussels/ (last accessed 11 Jun 2019).

81 Scottish Government, "Priority Species of Mollusc in the UK Biodiversity Action Plan and the Species Action Framework for Scotland" (2008). Available here: www2.gov.scot/Resource/Doc/915/0062262.pdf (last accessed 11 Jun 2019).

species under the EU Habitats Directive and classified as a globally endangered species by the International Union for Conservation of Nature.⁸² Scotland contains several of the largest remaining populations.⁸³ This event resulted in prosecutions of the hydro-power company and directors of the company's sub-contractors involved in the operations.⁸⁴

How should evidence of the potentially negative environmental effects of small-scale hydro-scheme influence the reform of private water rights? There are great limitations to the extent that private law can act as a check on processes that may be environmentally harmful. However, historically private law has been used in attempts to prevent environmental harm and, in the modern law, private law actions can be an important additional option where other regulatory mechanisms fail.⁸⁵ As mentioned above protecting water from the abuses of industry is part of the history of Scotland, as this is why the restrictive regime of private water rights in Scotland became settled in the 19th century.⁸⁶ Therefore, to consider environmental protection policies in addition to a social justice and economic perspective of reform may suggest that there should still be some, quite significant, limitations on use of water by landowners through the private water rights system in order to minimise damage to the natural aquatic environment.

5.4 MOVING BEYOND BOUNDARIES

What does this micro-analysis of small-scale hydro-schemes in Scotland reveal about reforming property law in the light of sustainability? The three factors that have been discussed in the preceding paragraphs are only a handful of the multifarious influences on the development of hydro-power as a renewable energy source in Scotland. Further, these three factors are only a tiny selection of many varied and diverse issues which could impact generally on water use and availability, and which could therefore feed into the law reform process when considering private water rights. Here I am not providing an ideal system of private water rights for Scotland. Instead I am offering a brief insight into the difficulty and complexity of reforming this area of law. Clearly, the transition to sustainability will not be a straightforward or easy journey. However, there is a theme which is demonstrated

82 See here: www.iucnredlist.org/species/12799/128686456 (last accessed 11 Jun 2019).

83 Scottish Government, "Wildlife Crime Priority Areas: 2017 Annual Report" (Dec 2018). See also A Reid, "Freshwater Pearl Mussel: Frequently Asked Questions" SPICe Briefing (Aug 2013).

84 See *Nisbet v Shawater Ltd* (2013) GWD 8-171 and *Nisbet v Smith* (2013) GWD 12-249.

85 See discussion in D. McGillivray and J. Wightman, "Private rights, public interest and the environment" in T. Hayward and J. O'Neill (eds), *Justice, Property and the Environment* (1997); J. Lowry and R. Edmunds (eds), *Environmental Protection and the Common Law* (2000); B. Pozzo (ed), *Property and Environment: Old and New Remedies to Protect Natural Resources in the European Context* (2007); B. Pontin, *Nuisance and Environmental Protection* (2013); G. Winter (ed), *Property and Environmental Protection in Europe* (2016).

86 See J. Robbie, *Private Water Rights* (2015) Ch. 6.

in the foregoing analysis, which is that to tackle the global challenges facing our natural resources and to evolve towards a more sustainable way of life, we must move beyond boundaries in our law reform processes in relation to property law, and therefore in our research. These boundaries are multiple and many are historically entrenched.

The first boundary is that between public and private law. In order to obtain a full overview of the regulation of water, it is necessary to consider provisions throughout the legal spectrum with a selection of examples given above relating to renewable energy, land reform and biodiversity. Yet, the influence of this legal spectrum is not limited to water. In particular, there are burgeoning regulations that focus on environmental protection and these regulations interact in complex and uncharted ways with our existing property rules. Property law researchers therefore need to give attention to the effect and impact of these regulations, both on our existing conception of property, and how our rules and principles should be reformed in light of these regulations.

It could be argued, in response to this assertion, that property law is concerned with the acquisition of wealth, and therefore primarily aimed at ensuring certainty and stability.⁸⁷ This area of law could be viewed as not being a vehicle for conceptions like social justice or environmental protection. Yet, social justice has been shown to have had a role in the historical development of private water rights in Scotland⁸⁸ as well as other jurisdictions.⁸⁹ Furthermore, the rules of property law clearly have *implications* for social justice and environmental protection. The cost of ignoring the social justice implications of property law has been notably demonstrated by the scholarship of Andre van der Walt in relation to South Africa.⁹⁰ Van der Walt states that supposedly apolitical doctrinal logic of property law in South Africa with its focus on certainty and stability often frustrated morally justified and legally authorised large-scale reforms.⁹¹ In relation to environmental protection, there is growing scholarship, which is beginning to consider the environmental implications of property law and how we need to reconceive our doctrines in pursuit of sustainability.⁹² However, much of this scholarship is from the Common Law world where the distinction between public and private law is less rigid than in European legal systems. Put simply by

87 S. van Erp, "From 'Classical' to Modern European Property Law?" in A. Sakkoulas and E. Bruylant (eds), *Essays in honour of Konstantinos D. Kerameus* (2009).

88 See discussion above.

89 See, for example, D. Schorr, *The Colorado Doctrine: Water Rights, Corporations, and Distributive Justice on the American Frontier* (2012) in relation to the prior appropriation doctrine of the western states of America.

90 See, for example, A.J. van der Walt, *Property in the Margins* (2009) Chs. 1 and 2.

91 *Ibid.*, p. 18-19.

92 Such as T.W. Frazier, "Protecting Ecological Integrity within the Balancing Function of Property Law" in (1998) 28 *Environmental Law* 53; P. Carruthers, S. Mascher and N. Skead (eds), *Property and Sustainability: Selected Essays* (2011); D. Grinlinton and P. Taylor (eds), *Property Rights and Sustainability: The Evolution of Property Rights to Meet Ecological Challenges* (2011); R.A. Barnes, "The Capacity of Property Rights to Accommodate Social-Ecological Resilience" (2013) 18(1) *Ecology and Society* 6; U. Mattei and A. Quarta, *The Turning Point in Private Law* (2018) Ch. 1.

American scholar Eric Freyfogle, “[m]any times, how property is employed also affects the surrounding community – socially, economically and ecologically – so the community and its interests must be taken into account.”⁹³

The importance of social and environmental factors in the regulation of land has been explicitly recognised in Scotland by the Land Rights and Responsibilities Statement, which is a guidance document produced by the Scottish Ministers that seeks to inform the policy and practice regarding land. The Statement declares: “The overall framework of land rights, responsibilities and public policies should promote, fulfil and respect relevant human rights in relation to land, contribute to public interest and wellbeing, and balance public and private interests. The framework should support sustainable economic development, protect and enhance the environment, help achieve social justice and build a fairer society...The holders of land rights should exercise these rights in ways that take account of their responsibilities to meet high standards of land ownership, management and use. Acting as the stewards of Scotland’s land resource for future generations they contribute to sustainable growth and a modern, successful country.”⁹⁴ To fulfil a vision like this, which is inspired by sustainability, property law researchers are required to broaden their horizons beyond the factors that have traditionally been considered in analysis and in reform.

Conversely, public law is not sufficient in and of itself to regulate natural resources. As noted by Taylor and Grinlinton in the introduction to this chapter, property rules are a crucial component in the system of regulation. A hydro-scheme can still be prevented in Scotland if private law consents are not obtained despite all public law requirements being met. Indeed, in relation to water, when reviewing the plethora of governance tools which have emerged in recent years regarding this resource,⁹⁵ it is clear that one concept has gained international acceptance: integrated water resource management (IWRM).⁹⁶ The Global Water Partnership defines IWRM as “based on the equitable and efficient management and sustainable use of water and recognises that water is an integral part of the ecosystem, a natural resource, and a social and economic good, whose quantity and quality determine the nature of its utilisation.”⁹⁷ The foundational principles of IWRM were established in the Dublin Statement on Water and Sustainable Development that was

93 E. Freyfogle, *The Land We Share: Private Property and the Common Good* (2003) p. 28.

94 Scottish Government, “Land Rights and Responsibilities Statement” (28 Sept 2017). Available here: <https://beta.gov.scot/publications/scottish-land-rights-responsibilities-statement/pages/3/> (last accessed 11 Jun 2019).

95 OECD, “OECD Inventory: Existing Tools, Practices and Guidelines to Foster Governance in the Water Sector” (2014). Available here: www.oecd.org/cfe/regional-policy/Inventory.pdf (last accessed 11 Jun 2019).

96 See, for example, S Hendry, *Frameworks for Water Law Reform* (2014) Ch 2.

97 Global Water Partnership, “The need for an integrated approach” (2017). Available here: www.gwp.org/en/About/why/the-need-for-an-integrated-approach/ (last accessed 11 Jun 2019).

adopted by the International Conference on Water and the Environment in 1992.⁹⁸ Shortly after this conference, in the same year, Agenda 21, the action plan of the United Nations for sustainable development, adopted at the Rio Conference on Environment and Development, then went on to further elaborate on the concept and its objectives.⁹⁹ A key aspect of this concept is integration of land and water-related regulation. The crucial connection between the regulation of water and land, and the role of property rights within the matrix of regulation, is therefore beginning to be explored by various scholars¹⁰⁰ and international agencies such as the United Nations' Food and Agriculture Organization¹⁰¹ (FAO) and the Global Water Partnership.¹⁰² The appreciation of the role of property rights in relation to matters of sustainability, however, is not limited to water as shown by the recent development by the FAO of the Voluntary Guidelines on the Responsible Governance of Tenure of Land, Fisheries and Forests in the Context of National Food Security.¹⁰³ This wide-ranging document considers the regulation of property rights from the perspective of progressive realisation of the right to adequate food. The Guidelines recognise that natural resources and their uses are interconnected and thus adopts an integrated and sustainable approach to their administration.¹⁰⁴

The second boundary is that of individual ownership. All land is connected to all other land. This has important consequences when considering the impacts of the use of one plot of land and therefore regulation of this use. This is easily demonstrated with respect to water as the law has historically been confronted with conflicts that relate to the use of a plot of land, which has consequences outwith that plot due to the flow of water. As explained above, this issue lies at the heart of the doctrine of common interest in Scotland. Yet, again this issue is not unique to water and the problem of how to rationalise the effects

98 United Nations, "The Dublin Statement on Water and Sustainable Development" (1992). Available here: www.wmo.int/pages/prog/hwrrp/documents/english/icwedec.html (last accessed 11 Jun 2019).

99 United Nations, "Agenda 21" (1992) A/COND.151/26 Ch. 18. Available here: <https://sustainabledevelopment.un.org/outcomedocuments/agenda21> (last accessed 11 Jun 2019).

100 See, for example, R. Meizen-Dick and L. Nkonya, "Understanding legal pluralism in water and land rights: lessons from Africa and Asia" in B. van Koppen, M. Giordano and J. Butterworth (eds), *Community-based Water Law and Water Resource Management Reform* (2007); L. Cotula, "The property rights challenges of improving access to water for agriculture: Lessons from the Sahel" (2008) 9(1) *Journal of Human Development* 5; L. Alden Wily, F. Dubertret, P. Veit, K. Reytar and N.K. Tagliarino, "Water Rights on Community Lands: LandMarks Findings from 100 Countries" (2017) 6(4) *Land* 77.

101 S Hodgson, "Land and Water: the Rights Interface" (2004) FAO Legislative Study 84.

102 Global Water Partnership, "Coordinating land and water governance – An essential part of achieving food security" (2014). Available here: www.gwp.org/globalassets/global/toolbox/publications/perspective-papers/07_perspectives_paper_land_water_governance.pdf (last accessed 11 Jun 2019).

103 Food and Agriculture Organization of the United Nations, "Voluntary Guidelines on the Responsible Governance of Tenure of Land, Fisheries and Forests in the Context of National Food Security" (2012).

104 *Ibid.*, p. 5.

of land use outwith individual plots has been discussed over centuries.¹⁰⁵ Nevertheless, as there is greater recognition of the interconnection and interdependence of ecosystems,¹⁰⁶ these developments in understanding should also be reflected in our legal conceptions. Ecosystems do not have boundaries that match property boundaries. Again Freyfogle notes that the “division of land into private shares merely divides the rights and responsibilities of ownership of a landscape: the landscape as a natural system remains at integrated as ever. Actions on one parcel do not stop at property boundaries.”¹⁰⁷

The third boundary is that of the national legal system. Property law is often regarded as the quintessential example of national law.¹⁰⁸ Land is a fixed resource within national borders and territories. However, the preceding paragraphs also emphasise the international aspect of property law reform by referencing targets and requirements, which are set at EU level. The EU’s targets must, of course, also be seen in the context of broader international developments.¹⁰⁹ National legal systems are nested within an ever more complex set of international and transnational obligations. Some of these obligations are intended to contribute to tackling the global scale and nature of problems such as human rights abuses and increasing environmental degradation. Law reform choices within one system can have consequences far beyond national boundaries, which suggests the vital need to consider wide-ranging international factors and developments when reforming property law.

The final boundary is disciplinary. Reference was made above to research on the ecological impacts of small-scale hydro-schemes. The challenges facing our natural resources are not purely legal and therefore the solutions will not be produced solely by lawyers. A collective response is required to tackle these challenges and researchers, including property law researchers, need to engage with other disciplines, in order to understand the scope and scale of the problems facing us and also to collaborate on the crafting responses. Examples of such an interdisciplinary approach to the challenge of sustainability from Scotland is the volume *Lairds, Land and Sustainability: Scottish Perspectives on Upland Management*¹¹⁰ which culminates in a practical sustainability tool for owners and managers of upland estates as well as the report commissioned by the Scottish Government on diversity of ownership in Scotland and its impact on social, economic and environmental

105 See, for example, J Gordley, “Immissionsschutz, Nuisance and Troubles de Voisinage in Comparative and Historical Perspective” 1998 *Zeitschrift für Europäisches Privatrecht* 13.

106 F Capra and U Mattei, *The Ecology of Law: Toward a Legal System in Tune with Nature and Community* (2015) p. 3-4.

107 E. Freyfogle, “Private Rights in a Connected Land” in C A Arnold (ed), *Wet Growth: Should Water Law Control Land Use?* (2005) p. 331.

108 See description in S. van Erp, “Comparative Property Law” in M. Reimann and R. Zimmermann, *The Oxford Handbook of Comparative Law* (2006) p. 1044.

109 Such as the United Nations Framework Convention on Climate Change (1992) 1771 UNTS 107 and the Convention on Biological Diversity (1992) 1760 UNTS 79.

110 J. Glass et al (ed), *Lairds, Land and Sustainability: Scottish Perspectives on Upland Management* (2013).

outcomes.¹¹¹ As Australian scholar Nicole Graham notes: “The Earth and jurisprudence are both systems. The Earth is a system of physical and interlinked relationships. Jurisprudence is a system of abstract laws. Jurisprudence is a human creation. As such, jurisprudence is a system that depends for its existence on the systems of Earth because the former is the creation of a species whose existence is of the latter. It is therefore important, indeed necessary, to situate the system of laws within the physical context of the Earth’s systems, because although the law currently situates itself above or separate to the physical realm, in reality the converse is true.”¹¹²

5.5 CONCLUSION

Barnes states that how to “best to manage dwindling, endangered, or finite resources in light of societies’ expanding and changing demands is one of the most important and difficult tasks facing us today.”¹¹³ As property law rules are those which most directly regulate use of these resources, these rules cannot be untouched by the transformation of our laws, policies and lives that will be required in order to contend with this task. This chapter has provided a micro-analysis of an issue in Scottish property law, which I argue has macro-implications. Considering the reform of private water rights in this way throws into relief the limitations of the current doctrinal methodology of property law research and reform. Although these limitations are perhaps more apparent in relation to water due to the necessity of water for all forms of life, I argue that these limitations have significance beyond the narrow issue of private water rights. In order to reform property law to contribute to the transition to sustainability, there are multiple boundaries that need to be surpassed, which involves significant changes to our conception of property and the methodology of legal research and reform. Andre van der Walt noted the requirement to challenge the existing logic and assumptions of law in order to achieve social justice within property law.¹¹⁴ In light of the ecological crisis of the Earth, I argue property lawyers need to continue this process of challenge and broaden their focus even further. As noted by Fritjof Capra and Ugo Mattei in their book *Ecology of Law*: “This, then, is the profound lesson we need to learn from nature: sustainability is not an individual property but a property of an entire web of relationships, and it always involves a whole community. A

111 S. Thomson et al, “The impact of diversity of ownership scale on social, economic and environmental outcomes: exploration and case studies” (Mar 2016).

112 N. Graham, “Owning the Earth” in P. Burton (ed), *Exploring Wild Law: The Philosophy of Earth Jurisprudence* (2011) p259.

113 R.A. Barnes, “The Capacity of Property Rights to Accommodate Social-Ecological Resilience” (2013) 18(1) *Ecology and Society* 6 at p. 6.

114 A. van der Walt, *Property in the Margins* (2009) p. 247.

sustainable human community interacts with other communities – human and nonhuman – in ways that enable each to live and develop according to their nature. Sustainability does not mean that things do not change. It is a dynamic process of coevolution rather than a static state.¹¹⁵ Moving beyond boundaries in property law research and reform may help to ensure that property law, reflecting the global movement, is also working towards preserving the Earth's resources for future generations.

115 F. Capra and U. Mattei, *The Ecology of Law: Toward a Legal System in Tune with Nature and Community* (2015) p. 177.

