



History voted many times in Ian McHarg's favor

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Abstract

In this *showcase* article, the author presents three exemplary instances of Ian McHarg's effective, time-honored socio-ecological practice research. Each case is powered by an insightful idea he discovered in practice and articulated for practice. These are, respectively, the idea “to green the earth,” the intrinsic “unsuitability for urbanization,” and “a profoundly simple concept” for building ecological resilience. Together, these examples make a compelling case for the statement that “McHarg had it right” many times.

Keywords Ian McHarg · *Design with nature* · Socio-ecological practice research · Ecopracticology · Ecological restoration · Ecological resilience · Land suitability · Staten Island · Superstorm Sandy · The Woodlands

1 Votes in favor of the idea “to green the earth”

“We must learn to green the earth, to restore the earth, and to heal the earth. I long to live to see it.” writes the late American ecological scholar-practitioner¹ and educator Ian L. McHarg (1920–2001) in his 1996 autobiography *A quest for life* (McHarg, 1996, p. 374). “I would love to be here when this process (of greening, restoring, and healing the earth—the author) is apace...In my mind's eye I see myself with a group of scientists, looking at the earth from space, viewing the shrinking deserts, the burgeoning forests, the clear atmosphere, the virgin oceans, smiling at the recovery, anticipating the day when a successor will announce, ‘the earth is healed, the earth is well.’” (*Ibid.*, p. 375)

23 years later, on February 11th, 2019, McHarg would have been euphoric to see the following news from NASA on twitter²:

“Good news for green thumbs: *The world is a greener place than it was 20 years ago*. Data from @NASAEarth satellites shows that human activity in China and India dominate(s) this greening of the planet, thanks to tree planting & agriculture. Get the data: <https://go.nasa.gov/2N10aW6>” (NASA 2019, italic by the author).

This is, however, not the first time that history voted in his favor.³

2 Votes in favor of “unsuitability for urbanization,” Staten Island, New York

In his 1969 landmark book *Design with nature* (McHarg 1969, pp. 103–115), McHarg presents an “intrinsic [land] suitability” assessment project⁴ he directed in 1968 on

¹ A scholar-practitioner is a scholar who is dedicated to generating new knowledge that is useful to practitioners and enlightening to fellow scholars (Xiang 2019a, p. 7 and p.9).

² National Aeronautics and Space Administration (NASA) is a federal agency of the USA with a mission to “reach for new heights and reveal the unknown for the benefit of humankind.” For more information, see <https://www.nasa.gov/>.

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³ Nor will it be the last—more good news are on the way. For example, “[e]cological restoration efforts are being ramped up globally”, report the authors of the 2016 “International standards for the practice of ecological restoration” (McDonald et al., 2016, p. 7). In this document, they also provide a concise list of ongoing ecological restoration projects around the world (*Ibid.*, pp. 7–8). By definition, ecological restoration is “[t]he process of assisting the recovery of an ecosystem that has been degraded, damaged, or destroyed.” (Society for Ecological Restoration, <https://www.ser.org/>, accessed March 18th, 2019).

⁴ “Once it has been accepted that the place is a sum of natural processes and that these processes constitute social values, inferences can be drawn regarding utilization to ensure optimum use

Staten Island in New York City for the New York Department of Parks. Among the 39 maps he includes is one titled “Unsuitability for urbanization” (*Ibid.*, p. 113). It delineates areas on the island that are intrinsically unsuitable for urban development because of the predominant restricting factors, such as high flood risk, poor surface and soil drainage, and proximity to the Atlantic Ocean. In particular, he calls attention to the foreseeable detriment of hurricanes and associated deluges—“Hurricanes (could—the author) sweep up over the oceans and bring tidal inundation (to the island—the author).” (*Ibid.*, p. 104)

Nearly half a century later, the proof of “Unsuitability for urbanization” came in an unfortunate, devastating way. On October 29, 2012, Superstorm Sandy hit the New York City area, including Staten Island. It dealt a punishing blow to the Atlantic side of the island, causing severe damages and 23 deaths (Wagner et al. 2016, p. 34; Yates 2016). An aftermath assessment reveals a remarkably high degree of overlap between the areas on the island that were evacuated by the Federal Emergency Management Agency (FEMA) as a result of Superstorm Sandy and the areas McHarg designated in his 1968 study as intrinsically unsuitable for urban development (Steiner et al. 2013, pp. 357–358; in particular, on page 358 is a telling juxtaposition of McHarg’s map “Unsuitability for urbanization” and a map of FEMA evacuation zones). Tragically, the 23 victims were all found in or near those unsuitable-for-urbanization areas along the east shore—the Atlantic side of the island [Wagner et al. 2016, p. 34; for a map showing the 23 death locations, see Yates (2016)]; and 86.6% of the damaged buildings located in the unsuitable-for-urbanization areas across the island (Wagner et al. 2016, pp. 42–43).

Further proofs were found in the subsequent actions socio-ecological practitioners⁵ took on the unsuitable-for-urbanization areas. Since the early 2014, a New York state voluntary home buyout program—NY Rising Buyout Program—has been in place to rectify the demonstrated

“incongruity of coastal risk and residential land use” along the east shore (NY Rising Community Reconstruction (NYRCR) Staten Island East and South Shores Planning Committee 2014, p. 67). Two different buyout zones were demarcated on the unsuitable-for-urbanization areas the 1968 study delineated (New York City Department of City Planning 2017; Wagner et al. 2016, p. 44) “with the objective of returning extreme risk areas back to a natural wetland state” (NY Rising Community Reconstruction (NYRCR) Staten Island East and South Shores Planning Committee 2014, p. 67).⁶ New and more restrictive zoning regulations were established on the designated “special coastal risk district” along the east shore, including the two buyout zones (New York City Department of City Planning 2017).

Evidently, “McHarg had it right,” to borrow a phrase from American ecological planner and educator Frederick Steiner (2012, in “Appendix” of this article).

3 Votes in favor of “a profoundly simple concept”, The Woodlands, Texas

In the early 1970s, McHarg led an ecological planning project for The Woodlands New Community in Texas, USA. He and his colleagues first conducted a thorough intrinsic land suitability assessment with the same method they employed in the 1968 Staten Island study (McHarg 1996, p. 258; Yang 2019, p. 69; see also footnote 4 in this article). Based on the assessment results, they developed a novel yet “profoundly simple concept” for building ecological resilience—to determine densities and land use from the geohydrological properties of the soils.” (McHarg 1996, p. 260)⁷ Manifesting

Footnote 4 (continued)

and enhancement of social values. This is its intrinsic suitability.” (McHarg 1969, p. 104) For a reflective, systematic description of this innovative approach to ecological planning, famously known as McHarg’s method, see McHarg (2007, pp. 26–55).

⁵ Socio-ecological practitioners are people who are engaged in socio-ecological practice, including, but not limited to, planners, designers, engineers, conservation activists, forest rangers, community advocates, environmental lobbyist, land managers, and municipal administrators (Xiang 2019a, p. 8). “Socio-ecological practice is the human action and social process that take place in specific socio-ecological context to bring about a secure, harmonious, and sustainable socio-ecological condition serving human beings’ need for survival, development, and flourishing. It ... includes six distinct yet intertwining classes of human action and social process—planning, design, construction, restoration, conservation, and management.” (*Ibid.*, p. 8).

⁶ Did the socio-ecological practitioners delineate the buyout zones with or without the knowledge of the 1968 “Unsuitability for urbanization” map? No evidence has been found in the literature for either scenario. This may well be the case in which practitioners discerned and implemented a piece of existing knowledge efficaciously yet inadvertently and unknowingly.

⁷ In a strikingly parallel yet apparently independent way, this concept for building ecological resilience came along with an ecologist’s concept of *ecological resilience*. In 1973, Canadian ecologist Crawford Holling introduced the term *resilience* to describe an observed property of natural ecosystems and defined *the resilience of ecological systems* (that is, *ecological resilience* in the subsequent literature, see Gunderson 2000) as “a measure of ... their (ecosystems—the author) ability to absorb change and disturbance and still maintain the same relationships between populations or state variables.” (Holling 1973, p. 14) Since then, a wealth of new knowledge has been generated about the art and science of ecological resilience (for reviews, see Biggs et al. 2015; Gunderson 2000; Wu and Wu 2013), and substantive progress made through instantiated experiments of building ecological resilience in human-dominated ecosystems—urban areas (For recent reviews, see Beller et al. 2018; Meerow et al. 2016; Romero-Lankao et al. 2016). As demonstrated here, it was around the same time Holling publicized his *conception of ecological resilience* that

this central tenet, in the ecological plan they crafted, development is allocated primarily on the nonporous soils so that “the addition of asphalt, concrete, and housing ... would have no appreciable (ecological—the author) effect” (*Ibid.*); detention and retention ponds and swales are “designed to accommodate extreme events” (*Ibid.*), and all concentrated on the more permeable soils so that surface water can percolate down into the underground and recharge the aquifer; and the richness of flora and fauna communities on the more penetrable soils is intact. (For more details about the implementation of this concept, see Lyle 1999, p. 103, p. 237; McHarg 1996, pp. 259–264; Xiang 2016, pp. 56–57; Yang 2019, pp. 69–75; Yang and Li 2016, pp. 24–29.)⁸

It did not take long before the town began to receive what American research psychologist Judith Rodin (2014) calls “the resilience dividend” (Rodin 2014) against urban flooding that McHarg and his colleagues promised in the ecological plan (McHarg 1996, p. 264). According to American landscape planning scholars Bo Yang and Shujuan Li, “The Woodlands survived storms that exceeded a 100-year level in 1979 and a 500-year level in 1994 with little property damage, while Houston (50 km away) was severely flooded during both events... In a tropical storm in 1987, two adjacent communities (Oak Ridge North and Timber Ridge) were awash, while The Woodlands survived unscathed.” (Yang and Li 2016, p. 24) During Hurricane Harvey in August 2017, while Houston’s flood management system was overwhelmed, “there were very few flooded streets in The Woodlands, and almost none existed in the early-built villages that were more faithful to McHarg’s (ecological—the

author) plan.”⁹ It is evident that The Woodlands demonstrated a greater level of resilience to flood than its adjacent communities and Houston ... The sharp contrast of flood resilience is a result of The Woodlands’ comprehensive ecological plan, which Houston lacks.” (Yang 2019, pp. 213–214)

Besides the dividends of ecological resilience, the town also enjoyed economic and social benefits the implementation of this “profoundly simple concept” provided. “The Woodlands now has a population of 30,000 with 10,000 jobs,” wrote McHarg in 1996, “[t]he forest is intact, the hydrologic system is in balance... the population is very gratified, as is the developer. Woodlands continues to attract an ever-increasing proportion of the Houston housing market. *But best of all is the demonstration that it is not only possible, but profitable, to design with nature. Nothing beats the combination of righteousness and profit.*” (McHarg 1996, p. 264, italic by the author)

This “profoundly simple concept ... has worked very well indeed,” he concluded in 1996 (McHarg 1996, p. 260), and would restate it 23 years later in 2019 with the backing of Yang’s comparative assessment on The Woodlands’ performance during Hurricane Harvey in 2017 (Yang 2019, pp. 213–214).¹⁰

4 Why did history vote these many times in McHarg’s favor?¹¹

This question is the focus of a *knowledge I&I* (implementation and impact) research article the author is developing for this journal (*Socio-Ecological Practice Research*—SEPR), and will be in the article’s title for sure.

Acknowledgements I dedicate this article to the fine memories of Professor Ian L. McHarg. During my first year of doctoral study (from Fall 1986 to Spring 1987) in the Department of City and Regional Planning at the University of California at Berkeley, USA, Ian was at Berkeley on a sabbatical leave from his home institution—the University of Pennsylvania, USA. He taught two classes—*A tentative theory for environmental planning and design* (Fall 1986) and *Man and environment* (Spring 1987), both of which attracted a wide range of students

Footnote 7 (continued)

McHarg came up with this “profoundly simple concept” for *building ecological resilience* and implemented it efficaciously in practice without using the term *ecological resilience*. No evidence, however, is found in the literature that Holling and McHarg had any intellectual contact directly or indirectly. Does this coincidence of human achievements suggest that Holling and McHarg were “epistemically privileged” (Kidd 2015, p. 345) equally in discovering truth, one as a pure scientist and the other a scholar-practitioner who once referred himself humorously to be a “crypto-pseudo-quasi-scientist” (McHarg 2007, p. 21)? Yes, indeed. But what are the secrets, if any, of McHarg’s success in discovering the truth and articulating it as a “profoundly simple concept” in this exemplary instance? This question pertains to McHarg’s way of knowing and will be explored in a *knowledge I&I* (implementation and impact) research article the author is developing for this journal.

⁸ American ecological planner and educator John Lyle regards the implementation of this “profoundly simple concept” in The Woodlands as an exemplary instance of “[t]he Taoist approach in recent practice” in his 1999 book *Design for human ecosystems: landscape, land use, and natural resources* (Lyle 1999, p. 237). He also provides a brief comparative review of Confucian and Taoist ideals of nature within the context of socio-ecological practice (*Ibid.*, pp. 236–239). For a succinct review on the concepts of nature in various Western cultural contexts, see Spirn (2002, pp. 31–33).

⁹ After the ownership change in 1997, subsequent development in The Woodlands deviated from the original ecological plan McHarg and his colleagues developed (Berger 2007, p. 8; Forsyth 2003, p. 13; Yang 2019, p. 65). But the legacy of George Michell (the former owner and developer), of which McHarg’s ecological plan is an integral part, “is still an important part of the community” (The Courier of Montgomery County 2017), and reinforced through the 2017 Hurricane Harvey (Schwartz et al., 2017).

¹⁰ For the latest about The Woodlands, “a real community, with jobs, housing, and recreation” (Forsyth 2003, p. 13), visit the official township website <https://www.thewoodlandstowship-tx.gov/>.

¹¹ There are more instances of McHarg’s effective, time-honored socio-ecological practice research. In addition to those above showcased, for example, a recently documented “Ian McHarg and ‘the ecology of the city’” can be found in Xiang (2019b).

and faculty members on and off campus. I took both classes and was privileged to complete my preliminary exam on *human ecology* under his guidance (he chaired the exam committee) in Spring 1987. Through many in-depth conversations during this memorable period of time, I was deeply moved by his love for Mother Nature and great “ambition of building something larger and more lasting” than himself [to borrow a phrase from Collins (2001, p. 36)]. My scholarly aspiration has been ever since inspired and professional path illuminated by his ideal of *design with nature*.

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Appendix¹²

McHarg had it right. An email disseminated to subscribers of Planning Educators Electronic Mail Network (planet@listserv.buffalo.edu)

From: Planning Educators Electronic Mail Network [PLANET@LISTSERV.BUFFALO.EDU] on behalf of Steiner, Frederick R [fsteiner@AUSTIN.UTEXAS.EDU]

Sent: Monday, November 05, 2012 12:05 PM

To: PLANET@LISTSERV.BUFFALO.EDU

Subject: McHarg had it right

In light of discussions about Superstorm Sandy and planning, I thought that some of you might find this interesting. My colleague Neil Korostoff (Penn State, npk1@psu.edu) sent me the attached image. On the left are the areas of Staten Island evacuated as a result of Superstorm Sandy and on the right unsuitable areas for urbanization from *Design with Nature* (1969).¹³

All best,

Fritz

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References

- Beller EE, Spotswood EN, Robinson AH et al (2018) Building ecological resilience in highly modified landscapes. *Bioscience* 69(1):80–92
- Berger A (2007) Forward. In: Margulis L, Corner J, Hawthorne B (eds) Ian McHarg: conversations with students: dwelling in nature. Princeton Architectural Press, New York, pp 7–8
- Biggs R, Schluter M, Schoon ML (eds) (2015) Principles for building resilience: sustaining ecosystem services in social—ecological systems. The Cambridge University Press, Cambridge
- Collins CJ (2001) Good to great: why some companies make the lead... and others don't. HarperCollins Publishers, New York
- Forsyth A (2003) Ian McHarg's Woodlands: a second look. *Planning* 69(8):10–13
- Gunderson LH (2000) Ecological resilience—in theory and application. *Annu Rev Ecol Syst* 31:425–439
- Holling CS (1973) Resilience and stability of ecological systems. *Annu Rev Ecol Syst* 4:1–23
- Kidd JJ (2015) What's so great about Feyerabend? Against method, forty years on Paul Feyerabend: against method, 4th edition. *Metascience* 24:343–349
- Lyle JT (1999) Design for human ecosystems: landscape, land use, and natural resources. Island Press, Washington, DC
- McDonald T, Gann GD, Jonson J, Dixon KW (2016) International standards for the practice of ecological restoration—including principles and key concepts. Society for Ecological Restoration, Washington, DC
- McHarg IL (1969) Design with nature. Doubleday/Natural History Press, Garden City
- McHarg IL (1996) A quest for life: an autobiography. Wiley, New York
- McHarg IL (2007) The theory of creative fitting. In: Margulis L, Corner J, Hawthorne B (eds) Ian McHarg: conversations with students: dwelling in nature. Princeton Architectural Press, New York, pp 19–61
- Meerow S, Newell JP, Stults M (2016) Defining urban resilience: a review. *Landsc Urban Plan* 147:38–49
- NASA (2019) Good news for green thumbs: the world is a greener place than it was 20 years ago. <https://twitter.com/NASA/status/1095144214533410816> and details <https://www.nasa.gov/feature/ames/human-activity-in-china-and-india-dominates-the-greening-of-earth-nasa-study-shows>. Accessed 20th Feb 2019
- New York City Department of City Planning (2017) East shore buy-out areas special coastal risk district and rezoning. Community Board 3, May 10, 2017. <https://www1.nyc.gov/assets/planning/download/pdf/plans-studies/resilient-neighborhoods/east-shore/east-shore-presentation-cb3.pdf>. Downloaded 24 Feb 2019
- NY Rising Community Reconstruction (NYRCR) Staten Island East & South Shores Planning Committee (2014) East and south shores Staten Island NY rising community reconstruction plan. NY Rising Community Reconstruction Program, New York https://stormrecovery.ny.gov/sites/default/files/crp/community/documents/state_nisland_nyrcr_plan_20mb.pdf. downloaded 24th Feb 2019
- Rodin J (2014) The resilience dividend: being strong in a world where things go wrong. Public Affairs, New York
- Romero-Lankao P, Gnatz DM, Wilhelmi O, Hayden M (2016) Urban sustainability and resilience: from theory to practice. *Sustainability* 8(12):1224. <https://doi.org/10.3390/su8121224>
- Schwartz J, Glanz J, Lehren AW (2017) Builders said their homes were out of a flood zone. Then Harvey came. The New York Times, December 2nd, 2017. <https://www.nytimes.com/2017/12/02/us/houston-flood-zone-hurricane-harvey.html>. Accessed 13th Apr 2019
- Spirn AW (2002) The authority of nature: conflict, confusion, and renewal in design, planning, and ecology. In: Johnson BR, Hill K

¹² Courtesy of Fritz Steiner, use with his permission.

¹³ A formal and more legible juxtaposition of these two maps can be found on page 358 in Steiner et al (2013).

- (eds) Ecology and design: frameworks for learning. Island Press, Washington, DC, pp 29–49
- Steiner FR (2012) McHarg had it right. An email disseminated to subscribers of Planning Educators Electronic Mail Network (planet@listserv.buffalo.edu), Monday, November 05, 2012, 12:05PM EDS (in Appendix of this article)
- Steiner FR, Simmons M, Gallagher M, Ranganathan J, Robertson C (2013) The ecological imperative for environmental design and planning. *Front Ecol Environ* 11(7):355–361
- The Courier of Montgomery County (2017) The Woodlands founder George Mitchell regarded as brilliant man with a brilliant mind. <https://www.yourconroenews.com/125years/article/The-Woodlands-founder-George-Mitchell-regarded-as-12177029.php>. Accessed 1st Mar 2019
- Wagner M, Merson J, Wentz EA (2016) Design with nature: key lessons from McHarg’s intrinsic suitability in the wake of Hurricane Sandy. *Landsc Urban Plan* 155:33–46
- Wu J, Wu T (2013) Ecological resilience as a foundation for urban design and sustainability. In: Pickett STA, Cadenasso ML, McGrath B (eds) Resilience in ecology and urban design: linking theory and practice for sustainable cities. Springer, Berlin, pp 211–229
- Xiang W-N (2016) *Ecophronesis*: the ecological practical wisdom for and from ecological practice. *Landsc Urban Plan* 155:53–60
- Xiang W-N (2019a) Ecopracticology: the study of socio-ecological practice. *Socio Ecol Pract Res* 1(1):7–14
- Xiang W-N (2019b) Ian McHarg and “the ecology of the city”. *Socio Ecol Pract Res*. <https://doi.org/10.1007/s42532-019-00012-8>
- Yang B (2019) Landscape performance: Ian McHarg’s ecological planning in the Woodlands, Texas. Routledge, London
- Yang B, Li S (2016) Design with nature: Ian McHarg’s ecological wisdom as actionable and practical knowledge. *Landsc Urban Plan* 155:21–32
- Yates J (2016) Hurricane Sandy’s Staten Island victims: 24 lives lost forever. https://www.silive.com/news/2016/10/remembering_hurricane_sandys_v.html. Accessed 21st Feb 2019



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