EcoWISE

Innovative Approaches to Socio-Ecological Sustainability

Bo Yang
Robert Fredrick Young *Editors*

Ecological Wisdom

Theory and Practice

Springer

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Prologue

Ecological Wisdom: Genesis, Conceptualization, and Defining Characteristics

EcoWISE

Ecological practice is the action and process that humans involuntarily engage themselves in with the aim to bring about a secure and harmonious socio-ecological condition that serves human beings' basic need for survival and flourishing. It is the most fundamental and arguably primordial practice *Homo sapiens* has been engaging in over thousands of years of coevolution with nature and falls into one or any combination of the following categories—ecological planning, design, construction, restoration, and management.

From ecological practice, humans acquired a distinctive master skill par excellence, *ecological wisdom*, that enables them to address and act well on intractable socio-ecological issues that are crucial to their survival and flourishing. While manifesting itself in a myriad of ecological and landscape projects and public policy instruments that has been beneficent to both humans and other residents on the earth, this invaluable intellectual asset of ecological wisdom continues to evolve in the contemporary society of unprecedented socio-ecological transformations, inspiring advancement in modern science and stimulating technological and engineering innovations for the greater good. Ecological wisdom-inspired science and engineering (EcoWISE, for brevity) is therefore the emerging transdisciplinary field of scholarly inquiry that seeks novel insights, deliberately through the lens of ecological wisdom, into contemporary socio-ecological issues, and aims to develop innovative, prudent, and efficacious scientific and engineering solutions. The Springer Nature EcoWISE book series provides a forum, the first of its kind, for the international community of scholars and practitioners to collectively advance this worthy enterprise.

The book series aims to publish authored or edited volumes that (1) offer novel perspectives and insightful reviews, through the lens of ecological wisdom, on emerging or enduring topics pertaining to ecological practice and research; (2) showcase exemplary scientific and engineering projects, and policy instruments that, as manifestations of ecological wisdom, provide lasting benefits to socio-ecological systems across all temporal and spatial scales; or (3) ideally coalesce (1) and (2) under a cohesive overarching framework. The series is intended to serve the broad international community of scholars and practitioners in socio-ecological practice and research.

Integral to EcoWISE are the questions pertaining to the genesis, conceptualization, and defining characteristics of ecological wisdom: What is it? Where does it come from? What defining characteristics does it have? In the following sections, I shall explore these three questions.[1]

Ecological Wisdom

There are three ways in which the scholarly construct of ecological wisdom is defined (for recent and succinct reviews of various definitions, see Liao and Chan 2016, pp. 111–112; Wang, et al. 2016). As described chronologically below, they derive from different etymologies and reflect varied intellectual traditions.

Ecological Wisdom as an Ethical Belief: *Ecosophy*

In a 1973 essay on the main characteristics of the deep ecology movement, Norwegian ecological philosopher Arne Naess coined the term *ecosophy*, by combining the ancient Greek words *ecos* (household place) and *sophia* (theoretical wisdom), to represent an individual's own personal "philosophy of ecological harmony or equilibrium (between human and nature—the author)" (Naess 1973, p. 99). Despite his intention to use this term "to mean ecological wisdom or wisdom of place" (Drengson and Devall 2010, p. 55), no formal articulation was made until 16 years later. In a 1989 essay entitled *From ecology to ecosophy, from science to wisdom*, he inaugurated the fused nexus of ecological wisdom and *ecosophy* with a strong proclamation that for humans "to live on Earth enjoying and respecting the full richness and diversity of life-forms of the ecosphere, … [e]co-wisdom (ecosophy) is needed" (Naess 1989, p. 185).

Along this *ecosophical* line of reasoning, there was a strikingly parallel development in a noncognate context and with no direct intellectual contact. In a 1996 seminal Chinese book *On ecological wisdom* (《生态智慧论》, *sheng tai zhi hui lun*), Chinese philosopher Zhengrong She (佘正荣) coined the term 生态智慧 (*sheng tai zhi hui*), in a way similar, yet unrelated, to Naess', by combining the Chinese words 生态 (ecological) and 智慧 (wisdom). He defined ecological

[1] Drawing primarily on Chinese and English literature owing to my linguistic capabilities, this synthesis is inevitably limited in its scope and thus subject to expansion.

wisdom as *ecohumanism* with the following proclamation (She 1996, pp. 3–4)[2]: "At the transitional juncture from the industrial to ecological civilization, human beings must supplant the anthropocentric humanism with ecohumanism. A tripartite worldview that blends seamlessly ecological sciences, ecological ethics, and ecological aesthetics, ecohumanism is the ecological wisdom human beings need, and can guide the contemporary human beings through the jungle of industrial civilization toward the bright future of ecological civilization."

Acknowledging that "ecological wisdom is the wisdom for living and survival that is rooted in and developed through the primordial process of human adaptation to the environment" (She 1996, p. 2),[3] he posited that the ecological philosophies (i.e., *ecosophies*, as defined by Naess) of some of the greatest thinkers in human history, including those of Laozi, Aldo Leopold, Aurelio Peccei, Holmes Roston III, Arnold Joseph Toynbee, and Zhuangzi, are but archived individual convictions drawing on collective *ecosophical* beliefs (Ibid. p. 3).[4]

This collective perspective of *ecosophy* deviates from the "whole personal view" (Drengson and Devall 2010, p. 56) of Naess'. According to Canadian philosopher Alan Drengson and American sociologist Bill Devall, Naess believes that "[s]ince there is an abundance of individuals, languages, cultures, and religions, there will be an abundance of *ecosophies*" (Ibid.). To differentiate, "[e]ach person's *ecosophy* can be given a unique name, possibly for the place they live, or for something to which they feel strongly connected." Exemplifying this individual's personal view are Naess' "*Ecosophy* T" (Drengson and Devall 2010, pp. 56–57) and Chinese ecological aesthetician Xiangzhan Cheng's "*Ecosophy* C" (2013).

Ecological Wisdom as a Dual Ability: *Ecophronesis*

In a 2017 article entitled *Ecological philosophy and ecological wisdom*, Chinese ecological philosopher Feng Lu (卢风) defined ecological wisdom as the dual human ability to make ethically and politically sound judgment and to take ensuing prudent actions in particular circumstances of ecological practice (Lu 2017, p. 278; p. 285).[5] This human ability approach to wisdom definition has its intellectual root in Aristotelian conception of *phronesis* (i.e., practical wisdom; for a recent and succinct review of Aristotelian *phronesis*, see Xiang 2016, pp. 54–55). It is in fact the philosophical underpinning of a 2016 essay on ecological practical wisdom by American geographer and planning scholar Wei-Ning Xiang (Xiang 2016). In a

[2] "人类在从工业文明向生态文明转变的历史关头,必须超越人类中心主义的价值观,形成一种使生态规律、生态伦理和生态美感有机统一的新的价值观。这就是生态人文主义的价值观。生态人文主义是当代人类所需要的生态智慧,它将引导人类安全地走向未来的生态文明。"

[3] "生存智慧来源于生物对环境的适应,因而生存智慧实质上就是生态智慧。对环境的适应是一切智慧最原始和最深刻的根源。"

[4] "生态哲学给人类提供了一些深刻的生存智慧。但是这并不是说,在现今的生态哲学中已经达到了尽善尽美的生存智慧,也不是说在生态哲学出现之前就没有产生过相当深刻的生态智慧。事实上,在东方古代的文化传统中就产生过非常深刻的生态直觉(智慧—作者),这些生态直觉(智慧)对于当代人类生态观的发展和完善具有十分重要的价值。"

[5] "生态智慧是在生态学和生态哲学指引下养成的判断能力、直觉能力和生命境界(涵盖德行)。生态智慧与人的生命和实践'不可须臾离'"(卢风, 2017, p. 285)。

way similar to that employed by Naess and She, Xiang coined the term *ecophronesis*, by combining two ancient Greek words *ecos* and *phronesis*, to represent ecological practical wisdom which he defined as "the master skill par excellence of moral improvisation to make, and act well upon, right choices in any given circumstance of ecological practice" (Xiang 2016, p. 55). Here, Xiang noted the term *skill* is used as an uncountable mass noun synonymous with the term *ability* (as in "the skill") [Ibid.].

Despite the nascent coinage of *ecophronesis*, both the term and the *ecophronetic* line of reasoning it represents are indeed, according to Xiang, an *ex post* recognition of and a revered tribute to an outstanding group of human beings throughout history (Xiang 2016, p. 59). *Ecophronimoi* are the people of ecological practical wisdom whose master skill par excellence of *ecophronesis* enabled them to be successful in challenging circumstances of ecological practice (Ibid.). Among the prominent *ecophronimoi* are the Chinese ecological planner and engineer Li Bing (480–221 BC) and his colleagues of many generations who collectively designed, built, and sustained the Dujiangyan irrigation system (256 BC to present) in Sichuan, China (Needham et al. 1971, p. 288; Xiang 2014, pp. 65–66), and the American ecological planner and educator Ian McHarg (1920–2001) and his colleagues who planned and developed the town of the Woodlands in Texas, the USA, in the 1970s (McHarg 1996, pp. 256–264; Xiang 2017a; Yang and Li 2016). Their *ecophronetic* practices of stellar quality have brought lasting benefits to the people and other living communities in the areas the projects serve, and clearly achieved the paramount level of "doing real and permanent good in this world" (Xiang 2014, p. 65).

Ecological Wisdom as a Cohesive Whole of *Ecophronesis* and *Ecosophy*

In his 2016 essay on *ecophronesis*, Xiang made the observation that not only are *ecophronesis* and *ecosophy* so profoundly linked, but the connection between them is indeed integral to *ecophronesis*. He noted that in the instances of prudent and successful ecological practice throughout human history, like those of aforementioned Dujiangyan irrigation system and the Woodlands, *ecophronimoi*'s mastery and execution of improvisational skill were mindfully bound by a moral covenant with nature and inspired and informed by the human beings' enlightened self-interest (Xiang 2016, pp. 57–58).[6] This union of improvisational ability and moral commitment is what American planning scholar John Forester calls "moral

[6]Human beings' enlightened self-interest is a term used in environmental virtue ethics that serves the same *ecosophical* function as Naess' *ecosophy* does—it is an ethical belief of the ecological harmony between human and nature (Cafaro 2001, pp. 3–5). According to Xiang (2017, p. 56), under the premise that there exists a relationship of human–nature reciprocity, "it states plainly that it is in human beings' self-interest—ethical, moral as well as material—to respect and appreciate the intrinsic value of all living and non-living beings on the earth; and that human beings' own flourishing, at individual and collective levels, should be conceived and pursued in ways that both sustain and depend on the flourishing of the entire 'more-than-human whole' of which humans are part." As "such nonanthropocentrism is a part of wisdom" (Cafaro 2001, p. 15) that is widely shared by people from around the world and across generations, including Naess (see his 1986 essay, p. 72), I use it here as a collective *ecosophy*.

improvisation" (Forester 1999, pp. 224–241). It is with this very master skill par excellence of moral improvisation that *ecophronimoi* became capable of being "doubly responsible" (Nussbaum 1990, p. 94) in any particular instance of ecological practice—honoring commitments and upholding principles on the one hand and attending specific circumstantial particulars, on the other (Xiang 2016, p. 58).

This observation corroborates Xiang's argument that as an *ex post* and long overdue recognition of a reverable human virtue in ecological practice, the scholarly construct of ecological wisdom is incomplete and unbalanced in the absence of either *ecosophy* or *ecophronesis* (Xiang 2016, p. 58). It provides support for his proposal, as depicted symbolically in Eq. (1)[7] (Xiang 2017b), that both *ecosophy* and *ecophronesis* should be juxtaposed at the core of ecological wisdom (Xiang 2016, p. 53).

$$\text{Ecological wisdom} = \textit{ecosophy} + \textit{ecophronesis} \tag{1}$$

This *ecophronetic* line of reasoning for "the *ecophronesis-ecosophy* nexus of ecological wisdom" (Xiang 2016, p. 58) finds supporting arguments in Naess' work on *ecosophy*. In the 1989 essay aforementioned, Naess argued that the ethical belief of *ecosophy* is a source of inspiration and guidance for both action and research. "[N]ot a philosophy in the academic sense" (Naess 1989, p. 187); he wrote, "[a]n articulated *ecosophy* includes an attempt to outline *how to inhabit the Earth* conserving her long range, full richness and diversity of life as a value in itself" (Ibid., p. 186). As such, "[w]ithin the framework of Ecosophy research enters primarily as 'action research'" that is "subordinated to practical policies," (Ibid., p. 188), and aimed at "the derivation of particular prescriptions (that are) adapted to particular situation" (Ibid., p. 187). The practical orientation of *ecosophy* and contextual characterization of *ecosophical* research Naess articulated here manifest in his own work on Ecosophy T and the Apron Diagram, and are readily evident throughout his later writings (for a succinct review, see Drengson and Devall 2010).

An Embracing Definition of Ecological Wisdom

Where the *ecosophical* and *ecophronetic* lines of reasoning converges, Xiang posited in a 2017 speech (2017b), emerges a definition of ecological wisdom that embraces *ecophronesis* and *ecosophy* into a cohesive whole. One such definition he initially presented (Ibid.) is further elaborated below.

> Ecological wisdom is the master skill par excellence of moral improvisation for and from ecological practice; it enables a person, a community or an organization to make ethical judgement and take circumspect actions in particular circumstances of ecological practice; it is a cohesive whole of the *ecosophical* belief in the relationship of human-nature reciprocity and the *ecophronetic* ability to make, and act well upon, contextually and ethically right choices.

[7] In delivering this keynote speech in Chinese, Xiang presented the equation as 生态智慧=生态哲思+生态实践智慧. A copy of the PowerPoint presentation is available from the author upon request.

This definition highlights two defining characteristics of ecological wisdom—the ability in ecological practice to achieve the ideal of the unity of moral knowledge and virtuous action, and the ability to conduct preeminent ecological practice research.

Ecological Wisdom as the Ability to Achieve the Unity of Moral Knowledge and Virtuous Action

Five hundred years ago, Chinese neo-Confucian philosopher Wang Yangming (王阳明, 1472–1529) coined the term *the unity of knowledge and action* (知行合一, *zhī xíng hé yī*) to designate a state of moral ideal that he believes "exists for all (humans)" (Ching 1976, p. 68) and can be achieved through and in practice (Ibid., p. 72). In this state of moral ideal, ethical knowledge (*i.e.*, knowledge of the good) and virtuous action (*i.e.*, action to do the good) are only two words describing the same one effort; and as such, one acts spontaneously yet virtuously upon deep moral convictions (Ibid. pp. 68–69).[8] Similar ideas are also found in Aristotle's thinking over two millennia ago. "For Aristotle," wrote Canadian political scientist David Tabachnick, "to be 'ethical' was more than simply knowing right from wrong, but also meant the capacity to act upon that (moral—author) knowledge." (Tabachnick 2013, p. 32).

Ecological wisdom as defined above enables a person, a community, or an organization to achieve Wang's ideal state of the unity of moral knowledge and virtuous action (for brevity, thereafter, *the unity of knowledge and action*) and to meet the Aristotelian ethical standard. As a master skill par excellence of moral improvisation, it activates and amplifies the action-guiding function of *ecosophical* belief such that the ethical knowledge of the good serves as a moral benchmark for one's sound judgment and virtuous action in particular circumstances of ecological practice (Xiang 2016, p. 56). The ensuing outcomes, in the forms of ecological plans, designs, construction and restoration projects, and management policies, are thus simply tangible manifestations of the knowledge of the good, and exemplified by, among others, the aforementioned Dujiangyan irrigation system and the Woodlands. This process of activating and realizing one's *ecosophical* belief is analogous to, if not the same as, *zhì liáng zhī* (致良知)—extending and realizing one's innate conscience (i.e., knowledge of the good) through virtuous actions in

[8] It should be noted that, according to Julia Ching, a Canadian philosopher and a word leading Wang Yangming scholar, for Wang Yangming, "…just as true knowledge is always knowledge of virtue, true action should always be virtuous action. 'The unity of knowledge and action' is primarily a moral ideal rather than a principle of epistemology" (Ching 1976, p. 66). Unfortunately, by many with good intentions it has been mistaken as a principle of epistemology (Dong 2013).

practice—a process that, according to Wang Yangming, leads to *the unity of knowledge and action*.[9]

In a 2003 essay, Chinese philosopher Mingying Deng reinvigorated Aldo Leopold's 1947 concept of ecological conscience (Leopold, 1968, pp. 207–210), and stated it as a coalesced nexus of "the consciousness of being part of a more-than-human whole; the sense of moral goodness of one's own conduct, intentions, or character; and a feeling of ethical obligation to do right or be good in the best interest of the more-than-human whole" (Deng 2003, p. 86).[10] *Eco-conscience* such defined is comparable to the *ecosophy* component of ecological wisdom (section "Ecophronesis: The Ecological Practical Wisdom for and from Ecological Practice") with a shared belief in the relationship of human–nature reciprocity. A subtle difference is that *eco-conscience*, or conscience by and large, is often regarded as an innate quality of every human being [i.*e.*, "the innate knowledge of the good" (Zhang 2017, p. 341)], while *ecosophy* is not reportedly so.[11] The difference can nevertheless be omitted here and now since even Wang Yangming himself makes no distinction between conscience and moral knowledge in his conception of *zhì liáng zhī* (Ching 1976, p. 67). As such, it suffices to say that ecological wisdom, through activating, extending, and realizing *eco-conscience* (*zhì* shēng tài *liáng zhī*, 致生态良知) or *ecosophical* belief grounded in eco-conscience, is capable of empowering a person, a community, or an organization to achieve Wang's state of moral ideal of *the unity of knowledge and action* in ecological practice and thus to become ethical by the Aristotelian standard.

Ecological Wisdom as the Ability to Do Preeminent Ecological Practice Research

In addition to activating the action-guiding function of *ecosophical* belief or *eco-conscience*, e*cophronesis* in the scholarly construct of ecological wisdom is capable of empowering scholar–practitioners and practitioners to do outstanding research for ecological practice.

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[9] "致吾心良知之天理于事事物物,则事事物物皆得其理矣。致吾心致良知者,致知也。事事物物皆得其理者，格物也。是合心与理为一者也。" (王阳明《王阳明全集》卷二《传习录中.答顾东桥书》, 上海古籍出版社, 1992).

[10]"(生态良知)是指人类自觉地把自己作为生物共同体的一员,把自身的活动纳入生物共同体的整体活动,并在此基础上形成的一种维持生物共同体和谐发展的深刻的责任感以及对自身行为的生态意义的自我评价能力。" (邓名瑛, Deng 2003, p. 86).

[11]More investigation is requested into the relationships between eco-conscience and *ecosophy*. In the writings on *ecosophy*, authors (Naess, Drengson, Deval, and Cheng, among others) predominantly treated *ecosophy* as a belief of environmental ethics with no articulation to eco-conscience. In a 2017 essay, on the other hand, Chinese ecological philosopher Xuezhi Zhang posited that one's achievement of the ideal moral state of *the unity of human and nature* is grounded in eco-conscience and speculated whether eco-conscience could integrate environmental ethics (2017, p. 342). However, no rigorous investigation into the relationships has been found in the literature.

Scholar–practitioners are scholars who are engaged in use-inspired basic research for practice (i.e., *practice research*) in Pasteur's quadrant and dedicated to generating *new* knowledge that is *useful* to practitioners (Xiang 2017, pp. 2243–2244). Common to all scholar-practitioners who have done outstanding ecological practice research, like McHarg, is their *ecophronetic* way of conducting practice research (Ibid., p. 2245). Wrote Xiang (Ibid., unless essential, citations in the original text are omitted for brevity), with *ecophronesis*,

> scholar-practitioners like McHarg became much capable of generating *new* knowledge that is *useful to the real*: not only did they advance scholarly rigorous—thorough and valid—knowledge that was also *immediately relevant*, *actionable*, and *potentially efficacious* to the real-world practitioners who were in specific knowledge needs under particular circumstances of ecological practice; but they also produced high caliber scholarship that is enlightening to scholars and practitioners from around the world and across generations who have interest in ecological practice research. Furthermore, because *ecophronesis* embraces inherently a transdisciplinary research capability in socio-ecological systems, *ecophronetic* scholar-practitioners like McHarg were immune from the pathogenic influence of 'ivory tower syndrome' (Toffel 2016, p. 1494). They became readily capable of bridging the arguably unbridgeable gap between scientific rigor and practical relevance, and taming the seemingly intractable problems of 'knowledge production' and 'knowledge transfer' (Sandberg and Tsoukas 2011, p. 338), all of which have been and remain to be persistent concerns in both circles of ecological practice and science in the modern-day world. As such, their *ecophronetic* way of conducting practice research manifested itself in a myriad of ecological projects and public policy instrument that has been providing lasting ecosystem services benefits to the human beings across generations.

It is noteworthy that the empowerment of *ecophronesis* equally benefits many practitioners who are engaged in pure applied ecological research that is motivated solely by the applied goals of problem-solving in practice (Xiang 2017, pp. 2242–2243). Exemplifying these *ecophronetic* practitioners are aforementioned Li Bing and his colleagues of many generations. Without seeking a scholarly understanding of the encountered phenomena through the scientific lens, they were enabled to conduct in an *ecophronetic* way preeminent research that contributed to the very success of their ecological practice of stellar quality.

Role Models and the Community of Scholar–Practitioners

One premise underlying *ecological wisdom-inspired science and engineering* (EcoWISE), the overarching concept of this book series, is that science and engineering need to and should be inspired by ecological wisdom. I hope that the preceding sections on the genesis, conceptualization, and defining characteristics of ecological wisdom have corroborated the premise to be just and appropriate. With regard to the subsequent question of *how* science and engineering should be inspired by ecological wisdom to serve the community of more-than-human whole on the earth, one way forward would be for us to emulate the role models of *ecophronetic* scholar–practitioners, whom the last two sections were dedicated to.

Ecological wisdom is not an abstract concept in the scholarly papers, and it is on clear display in the well-lived and fully realized lives of many practitioners and scholar–practitioners who have done preeminent ecological practice and research, and achieved the ideal moral state of *the unity of knowledge and action*. "A good example is the best sermon," to follow the example of these outstanding human beings, *ecophronimoi*, is both fitting and indeed rewarding. As a student of McHarg's in the 1980s, for example, not only did I witness that the unity of moral knowledge and virtuous action was like second nature to him, but I can also testify that like many of his students, my academic aspiration has been ever since inspired and professional path illuminated by his role model as an *ecophronetic* scholar–practitioner. With a gentle caveat that this way of inquiry for EcoWISE aims to examine and advocate *ecophronetic* practice research as a distinctive mode of practice research drawing upon the experience and examples of *ecophronetic* scholar–practitioners, rather than promoting the individuals themselves, I trust that the EcoWISE book series will become a celebrated venue for the building of a strong community of *ecophronetic* scholar–practitioners around the world and am confident that it will serve the community well in their pursuit of exemplary ecological wisdom-inspired ecological practice research and outstanding *ecophronetic* scholarship.

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References

Cheng XZ (2013) Aesthetic engagement, Ecosophy C, and ecological appreciation. Contemporary Aesthetics 11. http://quod.lib.umich.edu/c/ca/7523862.0011.009/–aesthetic-engagement-ecosophy-c-and-ecological-appreciation?rgn=main;view=fulltext

Ching J (1976) To acquire wisdom: the way of Wang Yang-ming. Columbia University Press, New York

Deng MY (2003) On eco-conscience (论生态良知). Ethics research (《伦理学研究》) 2003(2) 86–89 (In Chinese)

Dong P (2013) The unity of knowledge and action: the magnificent state of life ("知行合一":无限阔大的生命境界). A public lecture at Zhejiang University, Hangzhou, China, November 27, 2013. Zhejiang University News, http://www.news.zju.edu.cn/2013/1127/c763a63860/page.htm. Accessed on 26 Feb 2018

Drengson A, Devall B (2010) The deep ecology movement: origins, development and future prospects. The Trumpeter 26(2):48–69

Forester J (1999) The deliberative practitioner: encouraging participatory planning processes. The MIT Press, Boston, MA, USA

Leopold A (1968) A sand county almanac: and sketches here and there. New York: Oxford University Press

Liao KH, Chan JKH (2016) What is ecological wisdom and how does it relate to ecological knowledge? Landscape and Urban Planning, 155:111–113

Lu F (2017) Ecological philosophy and ecological wisdom (《生态哲学与生态智慧》). In: Lu F, Cao MQ (eds) Ecological philosophy: the pulsing spirit of the Anthropocence (《生态哲学: 新时代的时代精神》). Chinese Social Sciences Press, Beijing (中国社会科学出版社, 北京), pp 277–286

McHarg IL (1996) A quest for life: an autobiography. Wiley, New York

Naess A (1973) The shallow and the deep, long-range ecology movement. A summary. Inquiry 16 (1):95–100

Naess A (1986) Intrinsic value: will the defenders of nature please rise. In: Reed P, Rothenberg D (eds) Wisdom in the open air: the Norwegian roots of deep ecology, 1992. The University of Minnesota Press, Minneapolis, MN, USA, pp 70–82

Naess A (1989) From ecology to ecosophy, from science to wisdom. World Futures 27, 185–190

Sandberg J, Tsoukas H (2011) Grasping the logic of practice: theorizing through practical rationality. Acad Manag Rev 36(2):338–360

She ZR (1996) On ecological wisdom (《生态智慧论》, *sheng tai zhi hui lun*). Chinese Social Sciences Press, Beijing (中国社会科学出版社, 北京)

Tabachnick DE (2013) The great reversal: how we let technology take control of the planet. University of Toronto Press, Toronto

Toffel MW (2016) Enhancing the practical relevance of research. Prod Operations Manag 25 (9):1493–1505

Wang X, Palazzo D, Carper M (2016) Ecological wisdom as an emerging field of scholarly inquiry in urban planning and design. Landscape and Urban Plan 155:100–107

Xiang W-N (2014) Doing real and permanent good in landscape and urban planning: ecological wisdom for urban sustainability. Landscape and Urban Plan 121, 65–69

Xiang W-N (2016) Ecophronesis: the ecological practical wisdom for and from ecological practice. Landscape and Urban Plan 155:53–60

Xiang W-N (2017a) Pasteur's quadrant: an appealing ecophronetic alternative to the prevalent Bohr's quadrant in ecosystem services research. Landscape Ecol 32(12), 2241–2247, https://doi.org/10.1007/s10980-017-0583-y

Xiang W-N (2017b) Ecological wisdom inspired ecological practice is integral to the building of ecologically civilized society (生态文明社会的构建需要生态智慧引导下的审慎的城乡生态实践). A keynote speech at the International forum on sustainable solutions for new era of ecological civilization, Tsinghua University, Beijing, China, December, 2017

Zhang X (2017) Ecological consciousness and the conscience in the writings of Wang Yangming. In: Yao X (ed) Reconceptualizing confucian philosophy in the 21st century. Singapore, Springer Nature

Introduction: Ecological Wisdom as Discourse

Robert Young

Abstract In this chapter, I argue that ecological wisdom (EW) is becoming an important social and ecological discourse. Discourses are language and frames that establish first principles which in turn guide action. The role of discourse in framing ecological debate, policies, and design is tremendously potent, especially in light of today's significant intellectual, social, and ecological shifts. EW has been described by academics and scholar–practitioners as an "emerging field of scholarly inquiry," a " benchmark" in planning and design, a "domain of knowledge," and a "new framework for landscape and urban planning" (Fu et al. 2016; Liao and Chan 2016; Wang et al. 2016; Xaing 2014; Young 2016a). While most prominent in the fields of urban and regional landscape architecture and planning, I posit EW's potential as a discourse encompassing the realms of material science, civil engineering, architecture, anthropology, philosophy, psychology, political and urban ecology, and a wide range of other disciplines. Responding to the epochal challenges facing our society and life itself, EW draws upon history, science, spirit, culture, and place in its development. Accordingly, it offers a compelling discourse to guide society toward a more meaningful and successful role within the ecosphere and in realizing its own possibilities.

1 Introduction

Ecological wisdom, (EW), has variously been described by academics and scholar-practitioners as an "emerging field of scholarly inquiry," a "benchmark" in planning and design, a "domain of knowledge," and a "new framework for landscape and urban planning" (Fu et al. 2016; Liao and Chan 2016; Wang et al. 2016; Xaing 2014; Young 2016a). In addition to an important area of study, EW has also been labeled a vital imperative for action: "an urgent response" to "long-lasting and even irreversible ecological harms" (Liao and Chan 2016, 133).

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Given the rapid expansion of EW scholarship over recent years, including two international symposiums (Chongquing, China—2014 and Austin, Texas, USA—2016), two peer-reviewed special issues in the journals *Landscape and Urban Planning* (2016) and *Urban Management* (2017), articles on EW published in a variety of other peer-reviewed journals (Young 2016b; Zhao and Xu 2010), its influence in planning documents (Young et al. 2017), and this book series published by Springer Nature Press, I argue that EW is becoming an important social and ecological discourse. While most prominent in the fields of urban and regional landscape architecture and planning, I posit—and I believe this book in part reflects—its potential as a discourse encompassing the realms of material science, civil engineering, architecture, anthropology, philosophy, psychology, political and urban ecology, and a wide range of other disciplines.

2 Defining Terms

2.1 Wisdom

Before exploring the idea of EW as a discourse, it is important to first define terms. Fundamental to EW is the concept of wisdom itself. While the idea of wisdom has a long pedigree crossing many disciplines and cultures for the purposes of this piece I select the definition proposed by Gugerell and Riffert of wisdom as "a capability to act well based on experience, understanding, knowledge, insight and common sense" (Gugerell and Riffert 2011; Wang et al. 2016, 105). Inherent in this definition is the combination of learning and action. Fundamentally, wisdom is coordinating "knowledge and an ability to act" (Wang et al. 2016, 102).

2.2 Ecological Wisdom

The definition of ecological wisdom reflects this emphasis on praxis. Accentuating broad experience and learning, scholars note, EW "consists of evidence-based knowledge, tacit, and/or explicit that originates and evolves from diverse philosophical, cultural, and disciplinary backgrounds and across generations." It draws, ideally, on sources which are "transgenerational, transcultural, transphilosophical, and transdisciplinary" and is defined by active outcomes which achieve the symmetrical enhancement of social and ecological health (Xaing 2014, 67; Young 2016a). Thus, similar to *wisdom* writ large, EW is delineated by its mandate to combine knowledge and action: to be "a means of knowing, understanding, and applying ecological information" as a guide to good planning and design (Wang et al. 2016, 100). In this light, Fan (2008) defined EW simply as a "'wisdom of civilization' that is an organic unity of science and ethics" (Fu et al. 2016).

2.3 *Discourse*

Discourse lies at a critical juncture connecting knowledge with action. In his book, *The politics of the Earth: Environmental discourses*, published by Oxford University Press in 1997, John Dryzek described a discourse as "a shared way of apprehending the world." As such, he argued, a discourse is a means toward creating "coherent stories or accounts" each of which "rests on assumptions, judgments, and contentions that provide the basic terms for analysis, debates, agreements, and disagreements" (Dryzek 1997, 8). In this manner, he offered, discourses play a singularly vital role, establishing first principles which are decisive in guiding action. Thus, these first principles, rooted in language, matter.

3 The Power of Discourses

The role of discourse in framing ecological debate, policies, and design is tremendously potent. It "conditions the way we define, interpret, and address environmental affairs" (Dryzek 1997, 10). Indeed, philosopher Michel Foucault posits it represents the operation of power in its most primary form (Foucault 1980). Discourse is the first tool of authority to be deployed as it sets the subsequent bounds for debate and action. It is the wizard's spell. As a result, the struggle over shaping discourse is intense. It is not an ideal external to power that is then broken or bended by it—rather discourse is the expression of power itself as it begins to take form. It can be resisted or advanced by various influential tendencies but the end product is a synthesis of the relative strength of the forces engaged in this dialectic. While discourses can, through this process of competition evolve over time, they are very powerful in their moment of hegemony, swaying opinion and policies in the public and private sectors as well as among the general citizenry.

Beyond mere external influence, however, discourses can take deeper root. They often "become embodied in institutions" and thus "constitute the informal understandings that provide the context for social interaction, on a par with formal institutional rules" (Dryzek 1990, 19). In this manner, they "help to constitute and reconstitute the world just as surely as do formal institutions or material economic forces" (Dryzek 1990, 201). Consequently, discourses become the foundation, or perhaps better stated, the social physics molding these forces. In this regard, they are very potent and indeed, the only thing that can weaken them is a new discourse of gathering strength.

The basis of this strength is the ability of discourse to shape the stories we accept as accurately describing our world. According to Dryzek, discourses and the stories they enable are based upon four fundamental elements:

1. "Basic entities whose existence is recognized or constructed;
2. Assumptions about natural relationships;
3. Agents and their motives;
4. Key metaphors and other rhetorical devices" (Dryzek 1990, 16–17).

As noted above, I argue that the recent rise of EW in framing research, discussion, and active planning indicates its potential to constitute a new emerging and powerful discourse.

4 Ecological Wisdom as Discourse

4.1 Basic Entities

The first element Dryzek identifies as fundamental to the creation of a discourse is "basic entities whose existence is recognized or constructed" (16). For EW, these entities are broad-based. EW recognizes standard components such as institutions, social movements, and charismatic individuals. It also recognizes ecological forces as active subjects. In each of these categories, EW throws a wide net including for consideration entities both within the present as well as the past. In addition to this breadth, it acknowledges, across a wide cultural range, the material force, validity, and value of scientific rationalism as well as more ephemeral factors such as emotion and the spiritual (Eisenman and Murray 2016; Young 2016b). In this sense, it seeks to achieve Xaing's proposition of being "transgenerational, transcultural, transphilosophical, and transdisciplinary" (Xaing 2014, 67).

4.2 Natural Relationships

The second fundamental component constituting discourses are "assumptions about natural relationships" (16). EW contains a number of such assumptions, the primary being—as stated by landscape architect, Ian McHarg—that "natural processes constitute social values" (McHarg 1969). Like McHarg, EW argues the values embodied in these processes are of considerable significance and which, when understood and adhered to, offer substantial guidance toward proper planning and design.

EW also assumes such templates to "right action" are not easily discerned. As a discourse, EW recognizes the "wicked" nature of many challenges facing society and that the social/ecological interface is particularly rife with such complexities. The nature of their "wickedness" is the challenges they present to the equitable distribution of impacts and in gaining the social learning necessary to realize this equity. To address these challenges, EW emphasizes and draws upon a spectrum of support including historical experience, detailed understanding of short and

long-term ecological processes, and sensitivity to culture. To be effective, EW also assumes that although there are scientific, philosophical, and artistic elements that have general validity, this validity is modified by understanding all relationships to be, to a degree, context-dependent. Thus, EW argues, all relationships are engaged in an ongoing dialectic with history, place, and culture.

4.3 Agents

This process is carried out and further mediated by the next fundamental component Dryzek identified in discourse development: "agents and their motives" (16). In keeping with its broad-spectrum approach, EW recognizes a wide scope of agency. Unlike many other discourses, EW acknowledges ecological forces as agents both in their socially deleterious and beneficent forms. As noted, basic ecological processes and "black swans," extreme variations in these processes, are elemental drivers in the call for EW (Taleb 2010; Liao and Chan 2016).

EW recognizes social actors as well. EW researchers have identified certain professional bodies and their technically expert researchers and decision makers as constituent in the articulation of EW (Fu et al. 2016; Wang et al. 2016; Wang and Xaing 2016). Academics have also identified indigenous perspectives and social movements as vital actors in constructing EW's lexicon (Liao and Chan 2016; Patten 2016; Young 2016b).

In addition to institutional and cultural agents, EW researchers have given particular attention to inspired individuals such as the ancient Chinese hydrological engineer Li Bing, prominent landscape architects Fredrick Law Olmsted and Ian McHarg, ecologists Alexander von Humboldt, Ernst Haeckel, Arthur Tansley, and Howard and Eugene Odum, philosophers Laozi, Arnie Naess, and Zhengrong She, designers Sym van der Ryn and Stuart Cowan, and planner Sir Patrick Geddes (Liao and Chan 2016; Steiner 2016; Wang et al. 2016; Xaing 2014, Yang and Li 2016; Young and Clavel 2016). To this could be added a host of additional persons including Ellen Swallow Richards, Janine Benyus, Jane Jacobs, and others who could be viewed as innovators, thinkers, and practitioners of EW.

4.4 Metaphors and Rhetoric

Lastly, Dryzek identified "key metaphors and other rhetorical devices" as a primary factor in the coalescence of a discourse. In this area, EW shows particular strength. Central to presenting EW as a landscape and planning concept were the seemingly unusual rhetorical bedfellows of Andrew Carnegie and Daoist philosophy. Wei-Ning Xaing associated them in his editorial introducing EW to the readers of the journal of *Landscape and Urban Planning* through Carnegie's stated interest in

"real and permanent good," and the Daoist principles of *daofazirun*: "following nature's lead" (Carnegie 1889; Xaing 2014).

In combination, several EW researchers argue, the pursuit of these ideals point toward the Daoist concept of "right way" or "right choice." Postmodernism has, properly, created significant skepticism toward such notions without their being much more fully articulated and defined. In an effort to address this concept in greater detail I have posited "right choices" as indicated by actions which enable the symmetrical enhancement of social and ecological systems and their evolutionary potential (Young 2016a). This ideal is not unlike the "land ethic" articulated by Aldo Leopold in his, *A Sand County Almanac*"—"A thing is right when it tends to preserve the integrity, stability, and beauty of the biotic community. It is wrong when it tends otherwise" (Leopold 1949).

A similar rhetorical devise deployed in the EW literature is borrowed from landscape planner Ian McHarg's ideal of "design with nature." From his book of the same title, McHarg describes accomplishing this through acknowledging the "intrinsic suitability" of a particular piece of land or cultural edifice for a particular type of development (McHarg 1969). Wang and Xaing describe this manifestation of EW as "nature inspired design," and Liao and Chan further articulate it as "a systematic land development approach that avoids environmentally sensitive areas and works with natural dynamics" (Liao and Chan 2016, 112; Wang and Xaing 2016).

Such an approach is construed, especially by Asian EW scholars, as "harmonious" or aspiring toward an "harmonious coexistence with nature" (Fu et al. 2016; Wang et al. 2016; Zhang et al. 2016). This "harmony" is elucidated in a deeper sense than mere "balance" of therefore requisitely separated human and environmental realms (Fu et al. 2016; Wang et al. 2016). Rather, what this rhetorical term refers to is closer to a constructive fusing of their inherently interrelated dynamics. This is perhaps best reflected to date in the EW literature by the scientific rationalism of urban ecology and the spiritual Daoist ideal that classifies humans as simply a part of (rather than separate from) nature.

5 Knowledge and Action

As actionable method, EW researchers describe this unity as "practical wisdom" or "ecophoresis" (Xaing 2016). These terms note an approach centered on *engagement in* rather than the *management of* an environment that is described as having intrinsic value beyond its simple existence as a resource for meeting human needs (Wang et al 2016).

In addressing their approach to action most previous environmental discourses Dryzek identified such as survivalism, Prometheanism, administrative rationalism, democratic pragmatism, economic rationalism, sustainable development, green rationalism, and ecological modernization have sought to explain, to varying degrees, how to defeat, control, or conserve a subordinate nature. When not placed

in active opposition to nature, other discourses, such as those within green romanticism, largely reject scientific rationalism, labeling it a source of social and ecological domination, or seek to subordinate humans to an idealized Nature.

As a discourse, however, EW goes to none of these extremes. EW asks rather how humanity has and can evolve symmetrically with and within nature. EW views humanity as a fundamental part of the ecological domain, a domain whose characteristic of evolution applies to genetics as much to its social and technological expressions. As such, EW frames this evolution in terms of the development of human consciousness as well as our physical corpus; our scientific reason as much as our technologies. It sees our place in nature not as a problem to be solved but as a relationship to study, understand, elaborate, and refine.

In addressing this evolutionary process, previous discourses have often viewed past action alternately as binding precedent, immaterial antecedent, lost ideal, or a mere social construct; but EW regards the past and historical time in general as part of what might be called "the long present." The long present of EW is more akin to John McPhee's concept of deep time than traditionalism's backward gaze, modern rationalism's contemporary focus, green romanticism's idealization of a past, idyllic age, or postmodernity's refusal to see time as a coherent framework (McPhee 1998; Young 2016a). EW acknowledges the long present as encompassing both the importance of contemporary scientific rationalism as well as natural history and its resultant traditional ecological (and social) knowledge. Further, it recognizes the value of scientific inquiry as well as emotional and spiritual values in ascertaining wisdom in the ongoing development of human society.

Thus, the discourse of EW does not affirm any particular monopoly of knowledge or action in humanity's relationship to nature by declaring them dead, eternal, or non-existent. Rather, EW, by opening up the realms of thought and deed, democratizes them. Accordingly, a vast new array of possibilities in terms of design, policy, technology, and political economy are made available. None of these forms are anointed either permanent or relegated to the "end of history" or "muck of the ages" (Fukuyama 1989; Marx and Engels 1976). Consequently, current and past forms of tools, ideas, and designs are viewed as contingent, evolutionary entities that can move in a multiplicity of directions, appear, reappear, and evolve in our organization of society. As such, they can be labeled as, but not assessed by, being modern (or postmodern), past, futuristic, or contemporary. In this manner, they remain valid, emerging, reemerging, or dissipating as we establish an ecologically sound political economy, evaluated only by their impact on and ability to achieve the symmetrical healthy development of social and ecological systems. Thus, through the discourse of EW, enlightenment gains are retained while their blinders are discarded and shackles broken.

Within EW as discourse, then, there are no directing temporal or polemical gods that determine whether a technology or social form should be exalted or extinguished. Rather, in EW, to paraphrase Nietzsche, such gods are dead (or vulnerable to be killed). EW posits only the actual social and ecological results (immediate *and* long-term) as relevant in deciding what should fill the resulting vacuum. Within this relationship, our own collective constructions of political economy, spiritual

understanding, and agency must determine what social forms emerge. Industrial society in its present aspect (or its *post* persona) is not assumed triumphant or to have a monopoly on who and what can be admitted as viable for consideration. By the same token, under EW, traditional knowledge and radical environmentalist propositions are put to the test of scientific rationality to explore their potential value and impact in real time and upon real systems.

6 Conclusion

As Dryzek comments in his review of environmental discourses: "the way we think about basic concepts concerning the environment can change quite dramatically over time and this has consequences for the politics and policies that occur in regard to environmental issues" (Dryzek 1997, 5). In the face of today's significant intellectual, social, and ecological shifts, many existing discourses are limited in their capacity to either deeply reimagine contemporary society or to materially act in reconstructing it. Dryzek himself sees many lacking a "radical" edge that can give them greater potency and ability to transcend their limitations. This judgement is especially true if the original Latin meaning of the term "radical"—"to the root"—is the basis of this comment, for green romanticism for all its radical trappings is, at its core, an idealist approach with a problematic relationship to broad-based, material action.

EW offers a strong, new (and old) response to these limitations. Responding to the epochal challenges facing our society and life itself, EW draws upon history, science, spirit, culture, and place in its development. Accordingly, it offers a compelling discourse to guide society toward a more meaningful and successful role within the ecosphere and in realizing its own possibilities.

References

Carnegie A (1889) Wealth. North Am Rev 148(391):653–655
Dryzek J (1997) The politics of the Earth: environmental discourses. Oxford University Press, New York
Dryzek J (1990) Deliberative democracy: politics, policy and political science.
Eisenman T, Murray T (2016) An integral lens on Patrick Geddes. Landscape Urban Plann 166:43–54
Fan H (2008) Ecological wisdom of technology and ethics. J Jianga Adm Inst 40:17–23
Foucault M (1980) Power/knowledge: selected interviews and other writings, 1972–1977. Harvest, Brighton
Fu X, Wang W, Schock C, Stuckert T (2016) Ecological wisdom as benchmark in planning and design. Landscape Urban Plann 155:75–90
Fukuyama F (1989) The end of history? Nat Interest 16:3–18
Gugerell SH, Riffert F (2011) On defining "wisdom": Baltes, Ardelt, Ryan, and Whitehead. Interchange 42(3)

Leopold A (1949) A sand county Almanac. Oxford University Press, New York
Liao K, Chan J (2016) What is ecological wisdom and how does it relate to ecological knowledge? Landscape Urban Plann 155:111–113
Marx K, Engels F (1976) Feuerbach. In: Opposition of the materialist and idealist outlooks. New York: International Publishers
McHarg I (1969) Design with nature. Doubleday Press, Garden City, New York
McPhee J (1998) [1981] Basin and range. In: Annals of the former World, p 77
Patten D (2016) The role of ecological wisdom in managing for sustainable interdependent urban and natural ecosystems. Landscape Urban Plann 155:3–10
Steiner F (2016) The application of ecological knowledge requires a pursuit of wisdom. Landscape Urban Plann 155
Taleb N (2010) The black swan: the impact of the highly improbable, 2nd edn. Penguin Press, London
Wang X, Xaing W (2016) Ecological wisdom for urban sustainability: doing real and permanent good in ecological practice. Landscape Urban Plann 155:1–2
Wang X, Palazzo D, Carper M (2016) Ecological wisdom as an emerging foeld of scholarly inquiry in urban planning and design. Landscape Urban Plann 155:100–107
Xaing W (2014) Doing real and permanent good in landscape and urban planning: ecological wisdom for urban sustainability. Landscape Urban Plann 121:65–69
Xaing W (2016) Ecophronesis: the ecological practical wisdom for and from ecological practice. Landscape Urban Plann 155:53–60
Yang B, Li S (2016) Design with nature: Ian McHarg's ecological wisdom as actionable and practical knowledge. Landscape Urban Plann 155:27–32
Young R (2016a) Modernity, postmodernity, and ecological wisdom: towards a new framework for landscape and urban planning. Landscape Urban Plann 155:91–99
Young R (2016b) The biophilic city and the quest for paradise. J Smart Sustain Built Environ 5 (1):25–46
Young R, Clavel P (2016) Planning living cities: Patrick Geddes' legacy in the new millennium. Landscape Urban Plann 155:1–3
Young R et al (2017) The Santa Cruz project: internal development report to the municipality of Santa Cruz, Madeira Island. JH Press, Sesimbra
Zhang L, Yang Z, Voinov A, Gao S (2016) Nature-inspired stormwater management practice: the ecological wisdom underlying the Tuanchen drainage system in Beijing, China and its contemporary relevance. Landscape Urban Plann 155:11–20
Zhao JL, Xu YQ (2010) Ecological wisdom inspired from termite mounds. Analysis on biomimetic design of Zimbabwe Eastgate Center. Build Sci 2

Part I
Ecological Wisdom Theory

Ecophronesis: The Ecological Practical Wisdom for and from Ecological Practice

Wei-Ning Xiang

Abstract This essay addresses three questions pertaining to the assertion that ecological wisdom connotes both Platonian *sophia* (theoretical wisdom) and Aristotelian *phronesis* (practical wisdom): What is Aristotelian *phronesis* in the context of ecological wisdom? Why should it be juxtaposed with *sophia* at the nexus of ecological wisdom? How relevant is it to the contemporary ecological practice (planning, design, construction, and management)? The essay posits the construct of *ecophronesis* (ecological *phronesis*) as the ecological practical wisdom that people acquire from and use for ecological practice, describes the relationship between *ecophronesis* and Naessian *ecosophy* (ecological theoretical wisdom), and explores the relevance of *ecophronesis* to ecological practice and actionable science.

Keywords *Ecophronesis* · *Phronesis* · *Ecosophy* · Ecological practical wisdom
Ecological wisdom · Ecological practice · Moral improvisation
Actionable science

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Highlights

Ecophronesis is the master skill par excellence of moral improvisation in ecological practice.
It is inspired and informed by human beings' enlightened self-interest.
It is developed through reflective ecological practice.

1 Introduction

In a 2014 editorial on ecological wisdom, Xiang asserts (p. 67, original references are omitted for brevity).

> Unlike *ecosophy* which Norwegian philosopher Arne Naess coined in 1973, by combining the ancient Greek words *ecos* (household place) and *sophia* (theoretical wisdom), as a synonym for ecological wisdom or wisdom of place to represent an individual's personal 'philosophy of ecological harmony or equilibrium', the concept of ecological wisdom in the context of ecological research, planning, design, and management connotes both *sophia* and the Aristotelian concept of *phronesis* (practical wisdom), and embraces both individual and collective knowledge. As such, ecological wisdom is by nature ethical, inspirational, and yet still practical.

This assertion, aimed to delineate implicitly the scope of a reinvented concept of ecological wisdom that is distinct but not separate from that of Naessian *ecosophy*, necessarily raises questions as to *what* Aristotelian *phronesis* is in the context of ecological wisdom, *why* it should be juxtaposed with Platonian *sophia* at the nexus of ecological wisdom, and *how relevant* it is to the contemporary ecological practice of planning, design, construction, and management (hereafter ecological practice, for brevity). These questions are fundamental to the scholarship of ecological wisdom and centrally important to the enterprise of ecological wisdom research and practice. However, because of the nascence of ecological wisdom as a scholarly construct in the realm of ecological practice, and the predominant focus on *ecosophy* in the discourse of ecological wisdom (e.g., Cheng 2013; Drengson and Devall 2010; She 1996), they have neither been addressed nor ever raised until just now.

This essay aims to fill this knowledge gap. It is organized in the order by which the above three questions are raised with a preamble section on Aristotelian *phronesis* and its contemporary reinvigorated conceptions.

2 Aristotelian *Phronesis* and Its Contemporary Conceptions

In Book VI of *Nichomachean Ethics*, Aristotle describes *phronesis*, i.e., practical wisdom, as "a reasoned and true state of (human) capacity to act with regard to human goods… (that) is not concerned with universals only; … (but) also take(s)

cognizance of particulars…" (Flyvbjerg, 2001, p. 58; Tabachnick 2004, p. 999; Tabachnick 2013, p. 41). For Aristotle, *phronesis* is the intellectual virtue, or "the (human) ability to recognize and actualize whatever is best in the most complex, various, and ambiguous situations" for the good (Rorty 1988b, p. 272); it is distinct from, but no less than, the other forms of wisdom, *sophia* (theoretical wisdom), which pertains to universal truth (Flyvbjerg 2004, p. 289; Schwartz and Sharpe 2010, pp. 5–8; Tabachnick 2013, pp. 38–39).

Two millennia later, after a long period of marginalization in the western intellectual world (Chishtie 2012, p. 101; Flyvbjerg 2001, p. 53, p. 59, p. 70; Flyvbjerg 2004, p. 289), this classical construct of Aristotelian *phronesis* reemerged as a subject matter of scholarly discussion (Ellett 2012, pp. 14–19; Kinsella and Pitman 2012a, p. 1, p. 7; Tabachnick 2004, p. 997). Since the mid twentieth century, it has become an important theme of contemporary scholarship across a wide spectrum of fields outside philosophy and religious studies, the two knowledge domains where "[w]isdom has been a topic … since the dawning of human civilization" (Gugerell and Riffert 2011, p. 226). These include biomedical ethics, communication studies, cultural anthropology, education, professional practice, psychology, geography, management science, planning theory, and political science (e.g., Baltes and Staudinger 2000, p. 122; Flyvbjerg 2001, pp. 3–4; Flyvbjerg 2004; Flyvbjerg et al. 2012, pp. 1–2; Gugerell and Riffert 2011, p. 226; Kinsella and Pitman 2012a; Tabachnick 2004, p. 997). In the realm of ecological practice, however, no specific articulation of Aristotelian *phronesis* has been made.

In the evolving literature of neo-Aristotelian *phronesis* that came with the revival, the classical virtue has been reinvigorated to become more intelligible and operational in the modern context, and yet it remains rooted in the very same foundation Aristotle laid over two thousand years ago. For the discourse of ecological wisdom, and to address the three questions raised at the beginning of the essay, a brief review of some relevant and nonphilosophical conceptions of neo-Aristotelian *phronesis* is necessary and so provided in this section. Readers who are interested in a philosophical review are referred to the section *The importance of phronesis* in Zagzebski (1996, pp. 211–231).

2.1 Phronesis *Is the Master Skill Par Excellence for the Good*

In a 2010 book entitled *Practical wisdom: The right way to do the right thing*, American psychologist and economist Barry Schwartz and his political scientist colleague Kenneth Sharpe describe *phronesis* as the "moral *skill*" (Schwartz and Sharpe 2010, p. 8, p. 19, italic by the author) of "performing a particular social practice well" (Ibid., p. 5). Unlike artistic or technical or other specific skills, they emphasize that *phronesis* is the master skill par excellence (Ibid, p. 6) that enables its possessor to figure out "the right way to do the right thing in a particular

circumstance, with a particular person, at a particular time" (Ibid, pp. 5–6). In their influential work on the Berlin wisdom paradigm, German psychologists Paul Baltes and Ursula Staudinger utilize the general term *wisdom* in place of *phronesis* when referring to practical wisdom, and define it as "*an expertise* in the conduct and meaning of life" (Baltes and Staudinger 2000, p. 124, italic by the author), and characterize it as "a cognitive and motivational metaheuristic (pragmatic) that *organizes* and *orchestrates* knowledge toward human excellence in mind and virtue, *both individually and collectively*" (Ibid., p. 122, italic by the author). In developing a conceptual framework for *phronetic* social science, Danish planning scholar Bent Flyvbjerg defines *phronesis* as "a sense or *a tacit skill* for doing the ethically practical" (Flyvbjerg 2004, p. 287, italic by the author). Later, he and political scientist colleagues Todd Landman and Sanford Schram elucidate that *phronesis* is the practical wisdom "on how to address and act on social problems in a particular context" (Flyvbjerg et al. 2012, p. 1).

In these modern and nonphilosophical conceptions, authors all tend to reinterpret the classical notion as a more intelligible construct of human capacity, whether as skill or expertise. Here, the term *skill* is used as an uncountable mass noun that stands for the ability (as in *the skill*), coming from and orchestrating one's knowledge, practice, experience, etc., to do something well in a particular context; semantically, it differs from its own nuanced countable form (as in *a skill* or *skills*) which means a particular ability or type of ability [Oxford English Dictionary (http://www.oxforddictionaries.com/us/definition/learner/skill); Dictionary.com (http://dictionary.reference.com/browse/skill?s=t). Both were accessed February 28, 2016]. The term *expertise* in defining practical wisdom under the Berlin wisdom paradigm is used as a synonym of *skill* in its broader sense (Baltes and Staudinger 2000, pp. 124–125). Interestingly, not only is this inclination to defining *phronesis* as skill coextensive with the "virtue as skill" thesis proposed by some contemporary philosophers (for the thesis, see Stichter 2011, pp. 79–82; for philosophical accounts on the relationship between virtue and skill, see Annas 2011, pp. 16–32; Zagzebski 1996, pp. 106–116), but modern-day research on skill and expertise is also claimed to be a foundation for "the most plausible conception of the virtue as skill model" (Stichter 2011, p. 81).

What are the incentives for people to acquire and exercise *phronesis*? In regarding *phronesis* as skill, authors of neo-Aristotelian *phronesis* literature persistently sustain the premise Aristotle and most virtue ethicists, ancient and contemporary, hold that the motivational states of good intention are integral components of *phronesis* (Baltes and Staudinger 2000, p. 123, p. 127, pp. 131–132; Chia and Holt 2007, p. 510; Kemmis 2012, pp. 156–157; Van der Ryn and Cowan, 2007, p. 14). People acquire and exercise *phronesis* for *the good* within the frame of a well-lived and fully realized life (Rorty 1988a, p. 17; Rorty 1988b, p. 274), with the aim "to bring about a more secure and harmonious human condition" (Chia and Holt 2007, p. 510). The claim Australian education scholar Stephen Kemmis made in 2012 says it all (pp. 157–158), "The longing for *phronesis*, for (practical) *wisdom*, … is really a longing for a world in which people honestly and capably strive to act rightly and to avoid harm… (and to do) the good for each one and the good for humankind."

2.2 Phronesis *Serves the Practical Need for Making and Acting Well on Right Choices*

As skill, what human need does *phronesis* serve? Why is *phronesis* necessary? Aristotle recognized that human activities, whether in everyday life or in any type of social practice, demand choices most of which involve balancing or mediating among distinct and often clashing interests, competing aims, extremes of excess and deficiency in principles, and legitimate yet rigid rules; and that at the time of contemplated action, making the right choices begs for the ability or skill to not only find the balance, i.e., the "mean," that suits the particular circumstance in which a course of action takes place, but also coordinate intermediary interests, aims, principles, and rules into a single line of action. He contended that in the philosophical tradition, the only candidate for such virtuous ability or skill is *phronesis*—practical wisdom. This is not only because *phronesis* is directed toward practices, any kind of practice, in its own right with the whole range of intellectual and character excellences that determine what an action should be taken and how it is performed (Rorty 1988b, pp. 272–275), but also because the other form of wisdom *sophia*, the umbrella concept for theoretical wisdom advocated by both Socrates and Plato, pertaining to universal truth, is too abstract and context independent to meet the practical need for making context-dependent choices (Flyvbjerg 2001, pp. 55–57; Kemmis 2012, p. 157; Schwartz and Sharpe 2010, pp. 5–8, pp. 29–30; Zagzebski 1996, pp. 220–221). Furthermore, in the repository of human knowledge, neither *episteme* (i.e., scientific knowledge related to *sophia*) nor *techne* (i.e., craft-based knowledge) lends itself to serving this human need because the former, according to Socrates, Descartes and Kant, must, or at least aims to, meet the *sine qua non* of context-independence (Berkes 2012, p. 276; Chishtie 2012, p. 101; Flyvbjerg 2001, pp. 38–39); and the latter roots firmly in practical instrumental rationality (Kinsella and Pitman 2012a, p. 2; Tabachinck 2013, pp. 37–52). Only through activities that resemble those associated with *phronesis* (Chishtie 2012, p. 102, p. 113) can these two forms of human knowledge, and *episteme* in particular, be organized and orchestrated to facilitate the development of human excellence in social practice, both individually and collectively (Baltes and Staudinger 2000, p. 122).

In the literature of neo-Aristotelian *phronesis*, the line of reasoning has been widely embraced that advocates *phronesis* as an unsubstituted complement to *sophia*, *episteme,* and *techne*, and cultivates "the nexus that joins knowledge generation and professional practice in scientific and related professional communities" (Chishtie 2012, p. 112). It is in fact the main intellectual ferment for the *phronetic* revival across a wide spectrum of disciplines (Flyvbjerg 2001, 2004; Kinsella 2012, p. 35; Kinsella and Pitman 2012a, p. 1; Schwartz and Sharpe 2010; Tabachnick 2004, pp. 997–998; Zagzebski 1996).

2.3 Phronesis *Is a Gift to Those Who Reflect in and on Practice*

Aristotle believes that wisdom, especially practical wisdom, is not the gift of a few sages; ordinary people can learn to be wise in acting on practical matters through a learning-by-doing process (Annas 2011, pp. 16–17; Schwartz and Sharpe 2010, p. 5, p. 8, pp. 11–12). Modern-day psychological and neuroscience research reveals that people are born to be wise—having the potential to develop the intellectual and moral skill of practical wisdom (Schwartz and Sharpe 2010, p. 10, p. 52, p. 82); and that the development of these potentials requires the experience of learning by doing at either or both individual and collective levels (Baltes and Staudinger 2000, p. 124; Schwartz and Sharpe 2010, pp. 51–68). Here, the "learning-by-doing" experience means literarily that people learn to be practically wise by doing practically wise things (Schwartz and Sharpe 2010, p. 26). In a sense, it is similar to the "study-of-practice" experience described by American planning scholar Judith Innes, in which participants' learning, deciding, and acting all take place in an embedded context so that these otherwise tripartite activities are not, and conceivably cannot be, distinguished from one another (Innes 1995, p. 185).

But what, among possibly many practically wise things, can people do to enrich their "learning-by-doing" experience toward *phronesis*? R*eflection*, as revealed by the contemporary research on professional *phronesis*, is arguably the essential one (Kemmis 2012; Kinsella 2012; Sellman 2012; Weick 2007, p. ix). As Canadian professional practice and education scholars Elizabeth Anne Kinsella and Allan Pitman put it, "[p]ractical wisdom requires discernment and implies reflection" (Kinsella and Pitman 2012b, p. 165). American organizational theorist Karl Weick further corroborates that "a habit of profound reflection upon men and events" is a defining characteristic, along with "an ability to reach conclusions of universal as well as immediate value," of a person of practical wisdom (Weick 2007, p. ix).

According to American leading pragmatist, philosopher, and educator John Dewey (1933), reflection, when contextualized within reflective thinking, is an "*active, persistent and careful consideration of any belief or supposed form of knowledge in light of the grounds that support it and further conclusion to which it tends*" (p. 9). As such, "[*i*]*t converts action that is merely appetitive, blind, and impulsive into intelligent action*" (p. 17). This articulation between reflection and intelligent action is further developed by American philosopher Donald Schön into a bipartite yet cohesively fused process of *reflective practice* (Schön 1983, 1987, 1992), in which reflection occurs not only in the mid of practice (reflection-in-action), but also retrospectively (reflection on action) (Kinsella 2012, p. 38). By embracing a continuum of reflection (Kinsella 2012, p. 36) individually and/or collectively (Forester 1999, p. 249; Kemmis 2012, p. 159), a dialectic process of reflective practice cultivates the development of individual and/or collective *phronesis* (Forester 1999, p. 249; Freeman et al. 2007, pp. 171–173; Kemmis 2012, p. 158; Kinsella and Pitman 2012a, p. 9; Yanow and Tsoukas 2009, pp. 1345–1346).

3 *Ecophronesis*: The Ecological Practical Wisdom for and from Ecological Practice

Drawing upon the neo-Aristotelian conceptions above summarized, this essay posits *ecophronesis*, a brief form of *ecological phronesis*, as the practical wisdom in the context of ecological practice—ecological practical wisdom. More explicitly,

> *ecophronesis* is the master skill par excellence of moral improvisation to make, and act well upon, right choices in any given circumstance of ecological practice; motivated by human beings' enlightened self-interest, it is developed through reflective ecological practice.

As an extension of neo-Aristotelian *phronesis* to the realm of ecological practice, *ecophronesis* inherits and preserves the three defining characteristics discussed in Sect. 2 with regard, respectively, to what *phronesis* is, what it does and in what context, and how it can be developed. Nonetheless, because a number of unique and prominent characteristics ecological practice possesses, *ecophronesis* necessarily differs from its ordinary counterpart in at least two aspects.

3.1 Ecophronesis *Is Inspired and Informed by Human Beings' Enlightened Self-interest*

In ecological practice, like in any kind of social practice, people acquire and exercise *phronesis* for *the good*, with the aim "to bring about a more secure and harmonious human condition" for each one and for humankind (Chia and Holt 2007, p. 510; Kemmis 2012, pp. 157–158. See also discussions in subsection 2.1 of this essay). However, unlike in other kinds of social practice, such as medicine, education, mechanical engineering, and law, where practitioners primarily deal with human affairs in the context of socio-ecological systems, practitioners in ecological practice concern themselves *primarily* and *explicitly* with the relationship between human and nature on top of social relationships (Steiner 2016, pp. 1–4, p. 173). This unique characteristic of ecological practice necessitates the presence of a key idea in the *ecophronesis* definition, that of Human *beings' enlightened self-interest* in "the community of beings" (Berkes 2012, pp. 286–287; Cafaro 2001, p. 4).

The notion of *human beings' enlightened self-interest* is concerned with two fundamental questions in ecological practice—what should a "harmonious human condition" look like on the earth? How should it be pursued? In the belief that there exists a relationship of human–nature reciprocity (Berkes 2012, pp. 286–287), it states plainly that it is in human beings' self-interest—ethical, moral, and material—to respect and appreciate the intrinsic value of all living and nonliving beings on the earth (Berkes 2012, pp. 286–287; Cafaro 2001, p. 4, p. 16) and that human beings' own flourishing, at individual and collective levels, should be conceived and pursued in ways that both sustain and depend on the flourishing of the entire "more than human whole" of which humans are part (Cafaro 2001, pp. 8–9, p. 15).

As such, *human beings' enlightened self-interest* is both an ethical belief or position and a moral incentive in the construct of *ecophronesis*. In particular, as an ethical belief, it serves as what Austrian system scientist Eric Jantsch calls "a regulatory device" (Jantsch 1980, p. 14) of "effectively action-guiding" function (Rorty 1988a, p. 15; Rorty 1988b, p. 273) that provides people who hold the position with the benchmark for judging *what is right* to choose and the guidelines for deciding *how to act on* rightly in any given circumstance of ecological practice; as a moral incentive, it inspires people to acquire and exercise the skill of *phronesis* in ecological practice so that they are able to make, and act well upon, choices right for "the community of beings," and ultimately, through this *phronetic* process, to "become better people" living "more joyful lives" themselves (Cafaro 2001, p. 16; for similar ideas on *phronesis* in relation to well-lived and fully realized lives, see Rorty 1988b, p. 274).

The idea of *human beings' enlightened self-interest* in "the community of beings" is enduring and invigorative; its application to ecological practice has been fruitful throughout human history. As American archaeologist and environmental historian Charles Redman points out, in many ancient indigenous societies, ranging from the Australian aborigines, to the island Polynesians, to the American Indians, and to many small-scale predecessors of Western civilization, "[t]he dominant theme is *mutuality*, that is, existing under a moral order that blends together humans, nature, and sometimes even the gods into one family" (Redman 1999, p. 24). This notion, according to several scholars from diverse disciplinary backgrounds, including Fikret Berkes, a Canadian scholar of traditional ecological knowledge (TEK), Philip Cafaro, an American environmental philosopher, John Lyle, an American landscape planner, and Redman, has profoundly inspired the development of a series of similar ideas in environmental virtue ethics of the modern world. These include, but may not be limited to, ideas of Rachel Carson, Aldo Leopold, James Lovelock, George Marsh, Arne Naess, Albert Schweitzer, and Henry Thoreau (Berkes 2012, p. 287; Cafaro 2001, pp. 14–16; Lyle 1985, p. 139; Redman 1999, p. 22, pp. 25–27). Furthermore, underlying *design with nature*, a paradigm of ecological practice since the dawning of human civilization (Lyle 1985, p. 15, p. 264) that was made prominent through a 1969 seminal book of the same title by American landscape planner and educator Ian McHarg, is a "(moral) covenant between human communities and other living communities" (Van der Ryn and Cowan 1996, p. 104) that aims to "give expression to the potential harmony of man-nature" (McHarg 1969, p. 5). Among many exemplary cases in which the ecological practice of design with nature has benefitted both human and non-human beings are the 2300-year-old Dujiangyan irrigation system in Sichuan, China (Needham et al. 1971, p. 288; Xiang 2014, pp. 65–66), and the near half-of-a-century old town of The Woodlands in Texas, the USA (McHarg 1996, pp. 256–264; Yang and Li 2016, this volume).

3.2 Ecophronesis *Is a Master Skill Par Excellence of Moral Improvisation*

How exactly does *ecophronesis* serve human's ambition in any given circumstance of ecological practice to make, and act well upon, right choices that embrace human beings' enlightened self-interest? What exactly does *ecophronesis* comprise that enables it to do so? Inspired by Aristotle's idea that in order to acquire *phronesis*, one must follow the example of preexisting *phronetic* persons, that is, *phronimos* (Tabachnick 2013, p. 43), one approach to searching for insights into these questions is to study instances of exemplary ecological practice, and examine how people of ecological practical wisdom, *ecophronimos*, that is, worked *phronetically* and what master skill par excellence they acquired and employed. Like the study-of-practice approach the communicative action theorists proactively employ (Innes 1995, pp. 183–186), this way of inquiry aims to examine and advocate *ecophronesis* as a distinctive form of skill drawing upon the practice of *ecophronetic* individuals, rather than promoting the individuals themselves. After all, "[o]ur love of *phronesis* is a tribute to and an admiration for those who have it. Those who have *phronesis* gain it through (successful and unsuccessful) experiences in which they have aimed to 'do' … the good for each one and the good for humankind" (Kemmis 2012, p. 158).

One classic case in point is the aforementioned 1973 ecological planning project for the new town of The Woodlands in Texas, the USA, by Ian McHarg and his colleagues from Wallace, McHarg, Roberts and Todd (WMRT)—the Philadelphia-based architecture, landscape architecture, and urban planning firm that was contracted for the project. Apart from detailed accounts on the project and periodic assessment on its lasting benefits reported in scholarly articles and professional publications which are well documented in Yang and Li (2016, this volume), most illuminating is a 1996 reflection by McHarg in his autobiography *A quest for life* (1996, pp. 256–264).

At the beginning of the project, McHarg and his colleagues were stunned by the steep challenges they were facing. The planning site covers a forested area of 72 km^2 in southern Texas, 45 km north of the city of Houston, Texas. Physiographically, it features an extremely flat topography, a widespread coverage of impenetrable soil, and a close hydrological association, both surface and underground, with the city of Houston; conventional engineering approaches to storm water management had proven to be inadequate ecologically and expensive economically, resulting in almost all development projects in the area universally unsuccessful. In the face of these challenges, "[c]ould it (the site) support development, in terms of market and ecology?" (McHarg 1996, p. 256). To answer the question, an entirely novel approach was required. Wrote McHarg, "[w]e had to discover a method of development that would not increase runoff and would not lower the water table and, finally, we must accomplish artificial recharge of all water used so as to eliminate subsidence (in Houston)" (Ibid., p. 260). "To the best

of my knowledge each of these was a novel problem for planning. It was downright unfair to have to confront them all on a single site" (Ibid, p. 257).

The subsequent process was exploratory, reflective, and effective. Inspired by the observation that rare but highly permeable soil types correspond to the flora and fauna habitats and biodiversity, McHarg and his colleagues conducted a geohydrological analysis of the soils and concluded that the addition of asphalt, concrete, and housing on the already impermeable soils would have no appreciable ecological effect. A novel yet "profoundly simple concept" (McHarg 1996, p. 260) then emerged—to allocate land uses and determine their density from the geohydrological properties of the soils. Around this idea, an ecological master plan was developed. In the plan, development is allocated primarily on the nonporous soils; detention and retention ponds and swales are all concentrated on the more permeable soils permitting surface water to percolate down into the underground and recharge the aquifer; the ponds and swales are connected to a humanly augmented natural drainage system in which storm water is impounded briefly before entering the ponds and swales; and the richness of flora and fauna communities found primarily on the more penetrable soils is intact. Later in the planning process, a cost-benefit analysis was conducted through which McHarg and his colleagues demonstrated persuasively that implementing the design-with-nature plan would not only cut costs, when compared to plans developed under the traditional engineering approach, but also bring many dividends to the developer and the future residents during and after the development. The *ex ante* analysis, which McHarg eloquently presented with his plan, played a decisive role in convincing George Mitchell, the developer, and project engineers to adopt the plan (McHarg 1996, p. 264; Lyle 1985, p. 237).

It did not take long before the town began to enjoy what American research psychologist Judith Rodin (2014) calls "the resilience dividend" that McHarg and his colleagues had promised. The most tangible among many is the dividend of ecological resilience against urban flooding. Wrote McHarg (1996, p. 260), "[o]n two successive years, after portions of the new town were built, there were events of thirteen inches' precipitation in twenty-four hours (330 mm/24 h, that is). The pools were brimful, as were the streams and swales, but twenty-four hours later only the sediment on leaves showed the extent of inundation. There was no flooding in The Woodlands during those occasions when Houston was closed down by floods." Furthermore, this and other ecological, economical, and social dividends are remarkably steady and lasting—an *ex-post* testimony of an effective ecological practice that satisfies human beings' enlightened self-interest. Two decades later, McHarg offered the following reflection (Ibid., p. 264), "The Woodlands now has a population of 30,000 with 10,000 jobs. The 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*" (italic by the author).

This is evidently an exemplary case of *phronetic* ecological practice in which the *ecophronimos*, McHarg and his colleagues, *were enabled*, and therefore, able, to figure out extemporaneously the right way to do the right thing for the right reason in a particular place and time. But by *exactly what mechanism* were they enabled to do what they accomplished? It is arguably the skill or capability of moral improvisation.

Improvisation, when contextualized differently from improvisational jazz and theatrical performance where it originates, is an action an organization and/or its members take extemporaneously yet intentionally in practice to manage unforeseen challenges or to embrace emergent opportunities with available knowledge and resources (Cunha et al. 1999, p. 302, pp. 308–309; Hadida et al. 2015, p. 440; Laws and Forester 2015, pp. 358–360). Etymologically, the English word *improvise* derives from the Latin *improvisus*—unforeseen, unexpected—which is based on *provisus*, the past participle of *providere*—make preparation for (Oxford Dictionaries, http://www.oxforddictionaries.com/definition/english/improvise, accessed February 28, 2016). The importance of improvisation to practice has long been recognized (e.g., Forester 1999, pp. 224–241; Nussbaum 1990, p. 94, pp. 96–97). As American planning scholar John Forester puts it, "academics can theorize, but practitioners must improvise" (Forester 1999, p. 236). At an organizational level, improvisation is needed under multiple circumstances. These include, but are not limited to, situations when there is a pressing need to react to novel events or surprises, when novel events or surprises cannot be addressed adequately with existing plans or operational capabilities, or when an intentional decision is purposefully made to forego formal planning (Cunha, Cunha, and Kamoche 1999, p. 308; Pavlou and El Sawy 2010, p. 448). Because of its close association with organizational adaptability, creativity, innovation, and learning (Cunha et al. 1999, pp. 311–312), and because it can be nurtured and cultivated (Vera and Crossan 2005), improvisation as a distinct construct and efficacious action that help bridge the gap between theory and practice (Crossan 1998) has received much attention in recent years from a broad range of scholarly fields (For reviews on the growing area of organizational improvisation, see Cunha, Cunha, and Kamoche 1999; Weick 2002; and Hadida et al. 2015; for a recent account on organizational improvisation within the context of planning, see Laws and Forester 2015).

The ability to improvise effectively is considered a hallmark of practical wisdom (e.g., Frank 2012, pp. 53–54; Macklin and Whiteford 2012, p. 92; Rorty 1988b, p. 274; Schwartz and Sharpe 2010, p. 25). According to American philosopher Martha Nussbaum, for both Aristotle and American pragmatist William James, "the metaphor of theatrical improvisation … is a favorite … image for the activity of practical wisdom" (Nussbaum 1990, p. 94). In fact, Aristotle himself figured this out more than two millennia ago while observing how the masons used rulers on the Isle of Lesbos in Greece. Wrote Schwartz and Sharpe (2010, p. 28–29), "A normal, straight-edged ruler was of little use to the masons who were carving round columns from slabs of stone and needed to measure the circumference of the columns. Unless you bent the ruler. Which is exactly what the masons did. They fashioned a flexible ruler out of lead, a forerunner of today's tape measure. For Aristotle, … the

practice, and can be found in individuals, teams, or organizations. Further, the ethical position underlying the *ecophronesis* definition—human beings' enlightened self-interest—implies a "social norm" which might not necessarily be consistent with individual and often diverse *ecosophies* [e.g., Naess' "Ecosophy T" (Drengson and Devall 2010, pp. 56–57) and Cheng's "Ecosophy C" (2013)].

With these and other more nuanced differences to be identified, how could the two concepts be reconciled in a congenial manner under the umbrella construct of ecological wisdom? A full-scale investigation is requested.

5 *Ecophronesis*, Ecological Practice, and Actionable Science

How relevant is *ecophronesis* to the modern-day ecological practice?

In the contemporary society of unprecedented socio-ecological transformations, ecological practice takes place Wickedness in socio-ecological systems where human values and interests are diverse across different social, economical, and cultural groups, and where human beings' self-interest may not always coincide with the interests of nonhuman beings. Ecological practice must therefore attend simultaneously the vast variety of intertwining social and economical relationships within the human society as well as the relationship between human and nature. And yet, all of these relationships are characterized by high levels of complexity, wickedness, and in particular, context dependency (Xiang 2013, pp. 1–2, 2014, p. 66). This unique characteristic differentiates ecological practice from other social practices and underscores the importance of *ecophronesis* to ecological practice and potential advantages it can bring.

First, *ecophronesis* serves as an instrument that enables people to make prudent judgment and take constructive actions in dealing with socio-ecological issues in a particular circumstance of ecological practice. As demonstrated unmistakably in the exemplary instances of ecological practice, including those in The Woodlands and the Dujiangyan irrigation system (Needham et al. 1971, p. 288; Xiang 2014, pp. 65–66), the underlying commitment to defining and satisfying human beings' enlightened self-interest motivates people and guides them through the process of ecological practice; the moral improvisation capability it comprises enables people to act audaciously upon the challenges associated with novel problems or emergent opportunities, to be skillful at orchestrating available and developing new knowledge and resources to find and choose right solutions, and execute effectively.

Secondly, *ecophronesis* provides a way that helps bridge the gap between scientific theory and ecological practice. In the face of steep challenges toward human sustainability, people become increasingly cognizant of, and even more familiar with, a strikingly odd phenomenon. On the one hand, the world is desperately seeking science for effective ecological practice. For instance, in reflecting on attendees' sentiment at the 2011 Open Science Conference of the World Climate

Research Program held in Denver, Colorado, the USA, American journalist Richard Kerr asked "[t]ime to adapt to a warming world, but where's the science?" "Can science save us?" (Kerr 2011, p. 1053). Yet, on the other hand, scientists (natural, physical, and social) who "have been translating their science for policymakers and the media at an increasingly rapid pace" (Palmer 2012, p. 5) feel profoundly frustrated simply because their voices do not seem to be heard (Murphy 2006, p. 1; Palmer 2012, p. 5). As an alternative to the existent and apparently malfunctioning model of "more science, better science, and *then* effective communication" (Palmer 2012, p. 5), the concept of *actionable science* has been advocated (Kerr 2011; Palmer 2012; Nassauer et al. 2014). According to American ecologist Margaret Palmer, actionable science is "(the) science that is motivated to serve society" and "has the potential to inform decisions (in government, business, and the household), to improve the design or implementation of public policies, or to influence public or private sector strategies, planning and behaviors that affect the environment" (Palmer 2012, p. 6).

However, the prospect of actionable science for ecological practice would be less optimistic should it keep the orthodox tradition of modern science aiming to approach the six ideal criteria American philosopher Hubert Dreyfus articulates for scientific theory (drawing upon those of Socrates, Descartes, Kant, and others)—explicit, universal, abstract, discrete, systematic, complete and predictive (cited in Flyvbjerg 2001, pp. 38–39). This is because despite the fact that the context-independence (criteria 2, 3, 4) and predictive (6) requirements can be pursued and even met to some degree of scholarly rigor in natural or physical sciences whose subject matters are arguably tamable, they need to be carefully assessed in the development of socio-ecological systems research for ecological practice whose subject matters are wicked in general, and context dependent in particular (Rittel and Webber 1973; Xiang 2013). Moreover, the profound divide the actionable science enthusiasts advocate to close or at least reconcile in some congenial fashion between the two cultures of modern science and the humanities remains consistently persistent since the Enlightenment (Wilson 1984, pp. 47–49), constituting a substantial and often even more fierce barrier to the development of actionable science.

Ecophronesis, as both a scholarly construct and a Janus-faced fusion of ethical beliefs and mindful actions, provides a way that helps bridge the gap between scientific theory and ecological practice with its underlying premise of context-dependence and the moral improvisation capability. As demonstrated in The Woodlands example, with the commitment to being "doubly responsible" (Nussbaum 1990, p. 94) and the *ecophronetic* capacity to orchestrate available, and discover new, relevant knowledge and resources to meet the specific needs and local conditions, McHarg and his colleagues were capable of not only "getting the right science," but also "getting the science right" (National Research Council 1996, pp. 6–7). They sorted out the science and techniques suitable for the issues most relevant to planning and decision-making and performed the scientific analysis in a way that contributed substantively to the success of the ecological practice. Following "the principles for emancipatory knowing" (Innes 1995, p. 186), their way of research, *practice research*, is solely motivated by and entirely devoted to

practical interest, and leading to "emancipatory knowledge" (Ibid.) that is usable, useful, and efficacious in a particular instance of ecological practice. It is notably in sharp contrast to applied research, in which ecological practice is often regarded as an "applied" version of the knowledge, methods, and principles of a specific branch of natural, physical, or social sciences and is thus treated as a practical demonstration of the scientific principles (Buchanan 1992, p. 19). This seems to suggest a possible conception of an integrated approach to ecological practice, one that blends together knowledge (science) and action (practice) under the overarching framework of *ecophronesis*. Comparable to the knowledge–practice–belief complex Berkes developed in his TEK research (Berkes 2012, pp. 17–19), this *ecophronesis*–knowledge–action approach complements existent approaches (e.g., the six-principle approach by Van der Ryn and Cowan 1996); its moral improvisation capability embedded in *ecophronesis* can be nurtured and cultivated through practice, education, and training (Pavlou and El Sawy 2010; Vera and Crossan 2005); its practice research yields emancipatory and effectively actionable knowledge. With these foreseeable advantages, further research is warranted on the roles *ecophronesis*, in general, and the *ecophronesis*–knowledge–action approach, in particular, play both in bridging the gap between scientific theory and ecological practice and in contributing to the development of actionable science.

6 Conclusions

The term *ecophronesis* coined in this essay and its conceptualization are an *ex-post* recognition of and a revered tribute to those human beings, the *ecophronimos*, who, over thousands of years of human co-evolution with nature, developed the master skill par excellence of ecological practical wisdom that enabled them to make, and act well upon, the right choices in challenging circumstances of ecological practice. While manifesting itself in a myriad of ecological and landscape projects and public policy instruments that has been serving human beings' enlightened self-interest, the invaluable intellectual and character asset of ecological practical wisdom continues to evolve in a contemporary society of unprecedented socio-ecological transformations, stimulating advancement in modern science and inspiring technological and engineering innovations for the greater good. What *ecophronesis* offers then is a reinvented actionable perspective that motivates and enables people to act with a wisdom inspired *ecophronesis*–knowledge–action approach to ecological practice.

The proposed idea of *ecophronesis* opens up opportunities for innovative and transdisciplinary research. In addition to the topics outlined in the essay on its association with *ecosophy*, the conception of the *ecophronesis*–knowledge–action approach and its potential contributions to the development of actionable science, many possibilities exist. These include, but are not limited to, principles of *ecophronesis*, the nurture and cultivation of moral improvisation capability in ecological practice, practice research as a form or paradigm of knowledge inquiry

for ecological practice, and parallel *ecophronetic* concepts and ecological practices in different cultures and religions. Research on these and other topics will enrich immensely our understanding about this reinvented intellectual and character asset and inspire us to follow the lead of the *ecophronimos*, acting with wisdom and designing with nature.

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References

Annas J (2011) Intelligent virtue. Oxford University Press, Oxford, UK

Baltes PB, Staudinger UM (2000) Wisdom—a metaheuristic (pragmatic) to orchestrate mind and virtue toward excellence. Am Psychol 55(1):122–135

Berkes F (2012) Sacred ecology, 3rd edn. Routledge, New York

Buchanan R (1992) Wicked problems in design thinking. Des Issues 8(2):5–21

Cafaro O (2001) Thoreau, Leopold, and Carson: toward an environmental virtue ethics. Environ Ethics 23(1):3–17

Cheng XZ (2013) Aesthetic engagement, Ecosophy C, and ecological appreciation. Contemp Aesthetics 11. http://quod.lib.umich.edu/c/ca/7523862.0011.009/–aesthetic-engagement-ecosophy-c-and-ecological-appreciation?rgn=main;view=fulltext

Chia R, Holt R (2007) Wisdom as learned ignorance: integrating East-West perspectives. In: Kessler EH, Bailey JR (eds) Handbook of organizational and managerial wisdom. SAGE Publications, Los Angeles, CA, pp 505–526

Chishtie F (2012) Phronesis and the practice of science. In: Kinsella EA, Pitman A (eds) Phronesis as professional knowledge: practical wisdom in the professions. Sense Publishers, Rotterdam and Boston, pp 101–114

Crossan MM (1998) Improvisation in action. Organ Sci 9(5):593–599

Cunha MP, Cunha JV, Kamoche K (1999) Organizational improvisation: what, when, how, and why. Int J Manag Rev 1(3):299–341

Dewey J (1933) How we think: a restatement of the relation of reflective thinking to the educative process. Heath and Co, Boston

Drengson A, Devall B (2010) The deep ecology movement: origins, development and future prospects. Trumpeter 26(2):48–69

Ellett FS Jr (2012) Practical rationality and a recovery of Aristotle's "phronesis" for the professions. In: Kinsella EA, Pitman A (eds) Phronesis as professional knowledge: practical wisdom in the professions. Sense Publishers, Rotterdam and Boston, pp 13–33

Flyvbjerg B (2001) Making social science matter: why social inquiry fails and how it can succeed again. The Cambridge University Press, Cambridge, UK

Flyvbjerg B (2004) Phronetic planning research: theoretical and methodological reflections. Plann Theory Pract 5(3):283–306
Flyvbjerg B, Landman T, Schram S (2012) Introduction: new directions in social science. In: Flyvbjerg B, Landman T, Schram S (eds) Real social science: applied Phronesis. Cambridge Press, New York, pp 1–14
Forester J (1999) The deliberative practitioner: encouraging participatory planning processes. The MIT Press, Boston, Massachusetts
Frank AW (2012) The feel for games: everyday phronesis and social theory. In: Flyvbjerg B, Landman T, Schram S (eds) Real social science: applied phronesis. Cambridge Press, New York, pp 48–65
Freeman RE, Dunham L, McVea J (2007) Strategic ethics: strategy, wisdom, and stakeholder theory: a pragmatic and entrepreneurial view of stakeholder strategy. In: Kessler EH, Bailey JR (eds) Handbook of organizational and managerial wisdom. SAGE Publications, Los Angeles, CA, pp 151–177
Gugerell SH, Riffert F (2011) On defining "wisdom": Baltes, Ardelt, Ryan, and Whitehead. Interchange 42(3):225–259
Hadida AL, Tarvainen W, Rose J (2015) Organizational improvisation: a consolidating review and framework. Int J Manage Rev 17:437–459
Innes JE (1995) Planning theory's emerging paradigm: communicative action and interactive practice. J Plann Edu Res 14:183–189
Jantsch E (1980) Ethics and evolution. North Am Rev 265(3):14–18
Kemmis S (2012) Phronesis, experience, and the primacy of praxis. In: Kinsella EA, Pitman A (eds) Phronesis as professional knowledge: practical wisdom in the professions. Sense Publishers, Rotterdam and Boston, pp 147–161
Kerr RA (2011) Adaptation to climate change: time to adapt to a warming world, but where's the science? Science 334(25):1052–1053
Kinsella EA (2012) Practitioner reflection and judgement as phronesis: a continuum of reflection and considerations for phronetic judgement. In: Kinsella EA, Pitman A (eds) Phronesis as professional knowledge: practical wisdom in the professions. Sense Publishers, Rotterdam and Boston, pp 35–52
Kinsella EA, Pitman A (2012a) Phronesis as professional knowledge: practical wisdom in the professions. Sense Publishers, Rotterdam and Boston
Kinsella EA, Pitman A (2012b) Engaging phronesis in professional practice and education. In: Kinsella EA, Pitman A (eds) Phronesis as professional knowledge: practical wisdom in the professions. Sense Publishers, Rotterdam and Boston, pp 1–11
Kinsella EA, Pitman A (2012c) Phronesis as professional knowledge: implications for education and practice. In: Kinsella EA, Pitman A (eds) Phronesis as professional knowledge: practical wisdom in the professions. Sense Publishers, Rotterdam and Boston, pp 163–172
Laws D, Forester J (2015) Conflict, improvisation, governance: street level practices for urban democracy. Routledge, New York
Lyle JT (1985) Design for human ecosystems: landscape, land use, and natural resources. Van Nostrand Reinhold, New York
Macklin R, Whiteford G (2012) Phronesis, aporia, and qualitative research. In: Kinsella EA, Pitman A (eds) Phronesis as professional knowledge: practical wisdom in the professions. Sense Publishers, Rotterdam and Boston, pp 87–100
McHarg IL (1969) Design with nature. Doubleday/Natural History Press, Garden City, NY
McHarg IL (1996) A quest for life: an autobiography. Wiley, New York
Murphy AB (2006) Enhancing geography's role in public debate. Ann Assoc Am Geogr 96 (1):1–13
Naess A (1973) The shallow and the deep, long-range ecology movement: a summary. Inquiry 16 (1–4):95–100

Where Does Ecological Wisdom Come from? Historical and Contemporary Perspectives

Bo Yang, Shujuan Li, Wei-Ning Xiang, Ian Bishop, Kuei-Hsien Liao and Jun Liu

Abstract On October 17–18, 2014, the first international symposium on Ecological Wisdom for Urban Sustainability was held in Chongqing, China. The symposium engaged more than 200 participants from eight different countries and diverse disciplines (e.g., philosophy, ecology, architecture, landscape architecture, planning, engineering, literature) (Healey in Symposium on ecological wisdom for urban sustainability a great success 2014; Young in Landscape Urban Plann 166:27–36, 2016a). Besides having a fruitful and inspiring symposium, participants reached the consensus that answering several important questions is needed to move ecological wisdom research forward. These questions include: What is ecological wisdom? Where does it come from? How is it related to ecological knowledge? What are the general principles of ecological wisdom? Subsequently, a team of participants convened for a post-symposium workshop. This review is a

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result of these activities, which answers important questions raised above. In addition, this chapter speculates on how ecological wisdom can become (more) actionable in contemporary planning, design, and management. The chapter concludes with a proposal for future research.

1 Introduction

On October 17–18, 2014, the first international symposium on Ecological Wisdom for Urban Sustainability was held in Chongqing, China. The symposium engaged more than 200 participants from eight different countries and diverse disciplines (e.g., philosophy, ecology, architecture, landscape architecture, planning, engineering, literature) (Healey 2014; Young 2016a). Besides having a fruitful and inspiring symposium, participants reached the consensus that answering several important questions is needed to move ecological wisdom research forward. These questions include: What is ecological wisdom? Where does it come from? How is it related to ecological knowledge? What are the general principles of ecological wisdom?

Subsequently, a team of participants convened for a post-symposium workshop. This review paper is a result of these activities, which answers important questions raised above. In addition, this paper speculates on how ecological wisdom can become (more) actionable in contemporary planning, design, and management. The paper concludes with a proposal for future research.

2 Background of (Ecological) Wisdom Research

Recent decades have witnessed a renewed reflection on wisdom in the literature of social sciences such as psychology, education, management sciences, rather than in its traditional home disciplines of philosophy and religious studies (Gugerell and Riffert 2011). In order to understand the increasingly complex urban sustainability conundrum, there are calls for an integrated framework for (ecological) wisdom research across social and ecological arenas (Gugerell and Riffert 2011; Xiang 2014a, b).

As a subset of wisdom, ecological wisdom is a term that enjoys less recognition in the literature. However, it manifests itself widely in terminologies such as nature-inspired design, “green” policy and design, biomimicry, sustainable design and planning, biophilic design, and others (e.g., Yeang 1995; Beatley 2000, 2010; Benyus 2002; McDonough and Braungart 2002). Ecological wisdom is regaining broader recognition, and being proposed for use in socio-ecosystem planning and management (Patten and Xiang 2015).

Ecological wisdom is in particular relevant to the human and nature relationship. One of the central problems confronted by design professionals, as well as by those advocating a wise society more broadly, is how to properly tackle the

relation of human and nature. Today, urban sustainability faces stiff challenges with the coupled effects of human and biophysical changes (globalization). On one hand, a comprehensive approach is being called for to tackle grand sustainability challenges. On the other hand, sciences and technologies—considered as the solutions—are developing into increasingly compartmentalized sub-disciplines that lack the holism necessary for tackling sustainability challenges. Human civilization is at the crossroad in that deep ecological crisis cannot be alleviated simply through the accumulation and application of scientific knowledge. To effectively tackle global ecological crisis, we need ecological wisdom (She 1996; Yang and Zuo 2006; Lu 2014).

We argue that planning and design professionals should turn to select pre-modern and recent contemporary figures for guidance (Laozi and Aristotle, for instance). We sense in these figures a rich appreciation of (ecological) wisdom and ways that may help deal with thorny sustainability questions today (Ruderman 1997). The concepts of ancient ecological wisdom were developed in the absence of modern scientific methods. *Tao-de-jing*, for instance, written by Laozi (c.a. 571 BC–471 BC) distills the ecological wisdom of ancient Chinese and it remains influential worldwide today in the fields of philosophy, planning and design, management, and others (Feng 1991; She 1996; Cheng and Bunnin 2008). In India, Buddhism, especially the practice of Zen, presents a rich legacy of ecological wisdom and the pursuit of a harmonious relationship between human and nature (She 1996; Redman 1999).

Although our concept of "urban" has changed radically since ancient times, we use "urban" in this paper as a general description of human settlements in ancient and contemporary epochs. Urban areas have become increasingly reliant on resources imported (or captured) from their hinterlands (which have themselves become larger over the centuries). Consequently, urban areas are "hotspots" within which to tackle sustainability challenges. We seek to conjure up the spirit of ecological wisdom of both past and present traditions, and to explore actionable agendas to relate ecological wisdom with contemporary practices.

3 Ecological Wisdom and Principles

3.1 Definitions of Wisdom and Ecological Wisdom

The Oxford Dictionary of English defines "wisdom" as "the quality of having experience, knowledge, and good judgment." It is one's ability to make good ethical and political choices.

Wisdom is considered as a personality trait, which is related to knowledge, whereas the acquisition of knowledge does not guarantee the acquisition of wisdom (Gugerell and Riffert 2011).

There is no unified definition of "ecological wisdom." Norwegian philosopher Arne Naess first put forth the concept of "ecological wisdom" based on his ecocentric personal philosophies, ecosophies, combining the root words from ancient Greek ecos

(household place) and sophia (wisdom) (Drengson and Devall 2010). In this chapter, we provide a working definition of *ecological wisdom*—a wise person or society's ethic, knowledge, ability, and grit to do the right thing (or not do certain things), in socio-ecosystem planning, design, and management, as manifested in time-honored projects, efficacious policy instruments, and is informed by lessons learned.

3.2 *Brief Review of Ecological Wisdom from Wise Figures (Human–Nature Relationship)*

We elaborate on the above working definition through illustrations of the principles, composition, acquisition, and defining characteristics of ecological wisdom based on review of eight prominent philosophers, scholars, and practitioners (Fig. 1). Ecological wisdom strives for a harmonious relation of human and nature, and

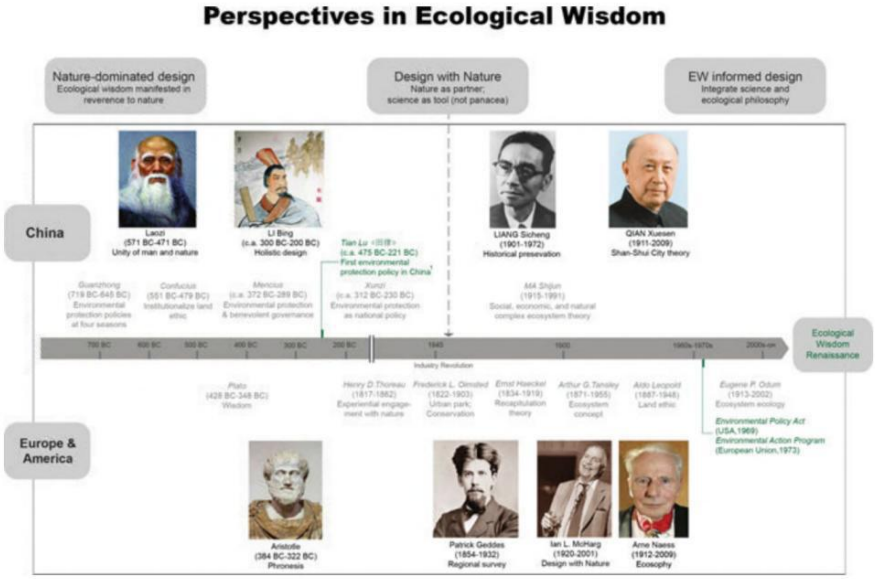

Fig. 1 Perspectives in ecological wisdom (EW): Key figures and (first) environmental protection policies in China and Europe–America [*Tian Lu* 《田律》 is an ancient environmental protection policy of Qin Kingdom during the Warring States (480 BC–221 BC). The policy, slated on Qin bamboo slips (秦简), was unearthed in Yunmeng, Wubei Province, China in December 1975. *Tian Lu* specifies six ordinances concerning agricultural land cultivation and preservation, mountain and forest land protection, and others. It also forcefully prohibits certain activities, such as blocking up river ways, deforestation, burning weeds and wood for fertilizer (air quality protection), and it controls pest migration to Qin Kingdom (i.e., customs quarantine practice that burns the yoke and rope on the horse). *Tian Lu* as ancient China's environmental protection policy is perhaps the first of its kind in the world (百度百科, n.d.; 人民政协报 2015)]

therefore invigorating urban sustainability in context of human interventions (Redman 1999; Gunderson and Holling 2002). The ideas of the above eight figures, along with other contributors, are placed in context of three main phases of ecological wisdom development over centuries, including—nature-dominated design, design with nature, and ecological wisdom informed design—which reflects an evolving understanding of human and nature relationship. Industrial Revolution suggests a tipping point after which humans start to deeply rethink the role of science (and technology) in promoting urban sustainability, and how human cooperation with nature can be better operationalized (Agarwal and Narain 1997; Benyus 2002).

Given the widespread and diverse sources of philosophical wisdom, such as Chinese, Indian, and Western cultures that nurtured philosophy (Feng 1995), for the purposes of this review we focus on China and Europe–America.

China has a history of more than 5000 years. Over the course of the nation's civilization, numerous people have contributed to the development of (ecological) wisdom. Ecological wisdom, like most fields, is in debt to a handful of visionary thinkers, four of which deserve special mention: Laozi, Li Bing, Qian Xuesen, and Liang Sicheng. Yet, China was not alone. Seminal ideas also evolved in parallel in western culture through prominent figures such as Socrates, Plato, and Aristotle. Relative recent contributors include Frederick Law Olmsted, Ebenezer Howard, Patrick Geddes, Aldo Leopold, Rachael Carson, Arne Naess, Ian McHarg, and others. Appendix provides a more detailed account on the perspectives in (ecological) wisdom from eight recognized historical figures.

3.3 *Principles of Ecological Wisdom*

The review of ecological wisdom development in China and Europe–America distills general principles of ecological wisdom, including reverence to nature, sustained relevance, holism, and practicality. These principles are manifested in evidence-based, time-honored ecological projects and effective policy instruments.

3.3.1 Reverence to Nature (Land Ethics)

Ecological wisdom starts with reverence for nature. Vehement love and concern toward nature is the premier principle of obtaining ecological wisdom (Xu and Nangong 2012). The way that humans express worship to nature varies across cultures and religions. Buddhism prescribes that every living organism has the potential to become a Buddha. Only with a respectful attitude to land (nature) can one obtain wisdom and, therefore, a happy life. This land ethic is also shared by Laozi's naturalistic philosophy. Laozi's concept of *wuwei* (no assertive action) is another means of revering nature through active procrastination. Procrastination is humanity's natural defense in a world that they do not and cannot (fully)

intellectual-related knowledge which has been accumulated throughout life (i.e., self-reflection is not essential).

These three frameworks show a common linkage between knowledge and wisdom. That is, knowledge is a required component for wisdom development, and wisdom acquisition can be open to everyone. Essentially, wisdom development is a cognitive process of self-reflection, reevaluation, or reaffirming of past experiences, and formulating (new) tacit knowledge. However, the level of wisdom that someone can achieve varies.

4.1.2 Ecological Wisdom Development: A Conceptual Model

There is little discussion in the literature on the development of ecological wisdom. Based on the common characteristics of the three existing frameworks, we propose a conceptual model for the process of ecological wisdom development at individual level (Fig. 2). This new framework provides a plausible, yet speculative, case on how design professionals can become practically wise(r).

Review of eight recognized wise figures reveals several defining characteristics among them, including knowledge, judgment (ethic), and ability to do the right things. These defining characteristics connote both the *principle-based knowledge* (Gugerell and Riffert 2011, p. 239) of what is true and right socio-ecologically and the *ability* to develop this knowledge effectively and apply it efficaciously (Xiang 2014a).

Knowledge Base

Declarative knowledge and procedural knowledge are two *conditio sine qua nons* for (ecological) wisdom development. The former is *knowing that* ("factual knowledge"), and the latter is *knowing how* (Gugerell and Riffert 2011, p. 237).

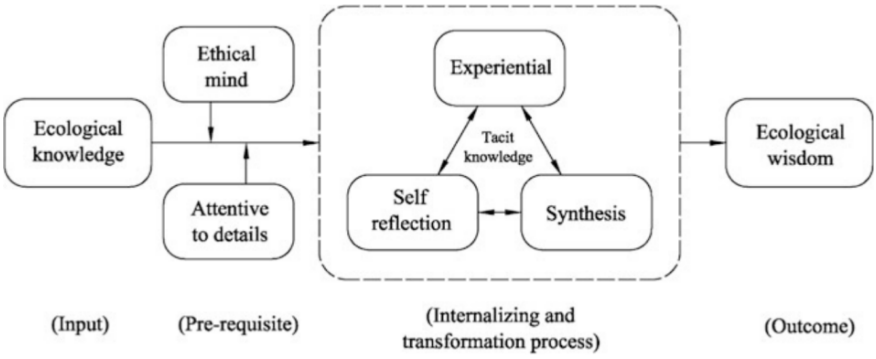

Fig. 2 Conceptual model of ecological knowledge to ecological wisdom transformation process at individual level