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Ethical Considerations in Managing the Hydrosphere: An Overview of Water Ethics

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Abstract

Water has a unique importance as the basis of life, and the ethical ramifications of managing water are correspondingly complex. Values about water constitute the building blocks for ethical guidance. Modern interest in developing a practical field of water ethics began with a UNESCO initiative (1998-2004) which analyzed best ethical practice in various water sectors (e.g., irrigation, domestic water supply, ecosystem health, etc.). A complementary approach has been to focus on particular normative values borrowed from the field of Human Rights such as Integrity, justice, and solidarity. A water ethics framework helps to integrate diverse and sometimes conflicting values through rendering the values about water visible and creating ethical space for dialogue and mediation. There is growing interest in approaching water policy decisions on the basis of normative values that can be diverse and mutually supportive. The widespread acceptance of agroecology as an alternative to mono-crop industrial farming, and corporate support for water stewardship initiatives, illustrate a societal turn towards valuing a broader range of spiritual, environmental, and social benefits of water. We are undergoing a transformation in how we perceive the water around us. The need for clarifying the ethical foundations of water management decisions has never been greater.

Water ethics is a subtheme of geoethics that has unique ethical significance. Water is the foundation of all biological life (Harding 2020), and at the same time, water is fundamental to human economic activities from agriculture to industrial processes and manufacturing. It is no exaggeration to say that freshwater is doubly allocated: Nature is already using every stream, river, lake, and aquifer to support biodiversity and ecosystem functions, while human economic systems are laying claim to that very same water to grow food, produce energy, manufacture goods and construct houses, cities and transportation networks. Ethics can provide some basic ground rules for deciding how best to protect natural water

ecosystems while ensuring an adequate amount of water for human needs (Falkenmark and Folke 2002; Grunwald 2016; Ziegler et al 2017).

Fortunately, water can be used more than once; indeed, the most remarkable feature of water is that it can be used over and over and over again. It evaporates only to return again to the hydrological cycle in the form of precipitation. This feature of infinite reusability adds a further ethical challenge: protecting water quality so it can more readily be reused. Reusability implies not only that water can be used again, but that it can be used for a different human purpose, or returned to nature in good condition to meet the needs of the rest of creation. The concept of "one water" (Kirshen et al 2018) reminds us that water use in one sector should not preclude its use in another sector later on. The wastewater from one city can be treated and reused by the next city downstream, provided no persistent toxic chemicals have been added.

From a water ethics perspective, oil and gas fracking using secret chemical cocktails is ethically problematic, not only for reasons of irretrievably contaminated water, but also for the environmental impacts of burning the oil and gas that water has helped to extract. Specifically, fracking illustrates two generic levels of water ethics: (1) How water is used to produce or manufacture economic goods, and (2) What is produced, and what values are being served. Water used in fracking fluid, for example, is typically discarded after use. Though cleaning the frack water is theoretically possible, it is prohibitively expensive to capture and treat and only about 10-15% of fracking water is reused (Canter 2018). Particularly in arid regions, this represents an enormous loss of precious water. The second level of ethical concern is what is produced with that use of water. In this case it is oil and gas products whose use exacerbates the climate crisis both directly, through carbon emissions, and indirectly through reinforcing the economic reliance on fossil fuels.

Similar sets of 2-level ethical issues arise in water use in other sectors. When an industrial, high volume dairy operation in the US state of Wisconsin became the first farm in North America to be certified as meeting the international Water Stewardship Standard (Grooms 2019) there was little question that water was now being used more efficiently (Level 1 ethics). But do large industrial dairy operations represent a desirable future for agriculture (Level 2 ethics)? Alternative, smaller-scale dairy operation might deliver a much broader range of benefits to local communities, ecosystems, and, arguably, to future generations.

In both cases, fracking and industrial-scale dairy farming, there are familiar value conflicts between business interests and environmental, social, and cultural values. Rarely are the conflicts black and white, but rather uncomfortably nuanced. Royalties from water-wasting fracking operations in my state of New Mexico provide major funding to public schools and universities. The industrial-scale dairy operation in Wisconsin is not only conserving water, but is demonstrating to other large-scale dairies that they too can find profitable ways to protect their local water ecosystems. An ethics-oriented analysis can help identify the operative values as well as value conflicts and synergies among water stakeholders, but then how can those value conflicts be resolved? Somehow we need a tool for evaluating the relative merits of conflicting water values and identifying opportunities for synergies, compromise, and/or innovations that will provide fair, just, and "good" outcomes. Ethics

offers a set of tools that can help us sort through the inevitably conflicting values around water.

1. Water Ethics

Ethics refers to the broad value principles and rules, whether tacit or explicit, that provide guidance about the proper course of action. Decisions about water management and policy cannot *not* reflect underlying principles embedded in society and culture (Schmidt and Shrubsole 2013, p. 372). Ethics provides a platform for assessing whether a potential action would be desirable, and guiding our vision toward what the UN Sustainable Development Goals refer to as, "The World We Want". By clarifying what we value about water and the ecosystems where water is found, and what we value for our own lives as members of multilayered human communities, we can assess, or "reflect upon" the wisdom of a potential course of action.

1.1. Recognizing Values

Water is increasingly recognized as something more than a factor of economic production, and rivers are viewed as more than nature's plumbing systems. Managing water ethically entails addressing the complex range of cultural, social, and psychological values embedded in water policies, projects, and investments. Values operate at a foundational level where we formulate the specific goals and objectives to be achieved through water policies. This process was laid out by Ralph Keeney (1992) in his book, *Value-focused Thinking: A Path to Creative Decision-Making.* Our values, goals, and specific objectives need to be sorted out carefully and deliberately. This is where ethics, and specifically "water ethics," comes into play. Ethics is the art of deciding what action should be taken in light of one's values, while at the same time holding up the values themselves for critical examination. Will the expression of these values lead to good outcomes? How can we promote water decisions that respond to the greater societal good, rather than to the strongest pressure group?

Consider the ethics of setting water quality standards for drinking water. On what basis can we assess whether a proposed drinking water standard for a particular class of chemicals, Let's take the case of PFAS-related chemicals, strikes the right balance between practical efficiency and public health. An ethicist would consider society's responsibility to protect public health, potential effects on natural ecosystems, and implications for the industries using these chemicals. Sadly, but not surprisingly, "ethicist" is not part of any job description that I am aware of within the water sector. While ethics are always operating, albeit tacitly, to guide water decisions, analysis of those ethics is rarely conducted. We are quite literally managing our water -- the basis for all life -- without considering the ethics of what we are doing.

1.2. The Emergence of Water Ethics

The formal study of water ethics began with the 1998-2004 UNESCO initiative on "Water and Ethics "(Delli Priscoli et. al. 2004). A background paper on "Ethics of Freshwater Use" (Selborne 2000, pp.7-8) presented six universal ethical principles "directly applicable to the issue of water": (1) human dignity, (2) participation, (3) solidarity, (4) human equality, (5)

common good, and (6) stewardship. The initiative produced a series of fourteen reports on various aspects of water ethics, ranging from gender to groundwater to environment, plus an integrative report, *Best Ethical Practice in Water Use* (Brelet and Selborne 2004). A few years later, the Bangkok office of UNESCO produced a report on *Water Ethics and Water Resource Management* (Liu et al. 2011) as part of the project on "Ethics and Climate Change in Asia and the Pacific." And more recently, UNESCO-COMEST undertook a broader assessment of water ethics, including the oceans, under the title "Water Ethics: Ocean, Freshwater, Coastal Areas" (COMEST 2018).

The UNESCO initiatives had the dual purpose of *describing* the normative values embedded in water policy decisions, and *prescribing* what the normative values should be. These themes were further elaborated by the Botin Foundation in Spain, which sponsored two seminars on water ethics in 2007 (Llamas et al. 2009) and 2010 (Delli Priscoli 2012; Llamas 2012). The Botin Foundation seminars had the explicit intent of convening water experts from different religious traditions to share perspectives, but "not to produce some kind of common declaration or moral blueprint which would have universal validity" (Llamas et al. 2009, p. xi). Independent from this "UNESCO lineage" is the work of David Feldman whose book, *Water Resources Management: In Search of an Environmental Ethic* (Feldman 1991), pioneered the application of environmental ethics to water management within the United States, and Sandra Postel, who demonstrated the relevance of ethics to water with her book, *Last Oasis: Facing Water Scarcity* (Postel 1997).

An important step towards establishing a field of water ethics was the publication in 2010 of *Water Ethics: Foundational Readings for Students and Professionals*, edited by Peter Brown and Jeremy Schmidt. With the humble purpose "to provide an overview of the emerging field of water ethics by drawing on representative points of view" the book also offered a philosophical critique of the broadly accepted water paradigm, Integrated Water Resources Management (IWRM). Voices of Indigenous Peoples, largely missing in the Brown and Schmidt book, were better represented in two UNESCO books, *Water and Indigenous Peoples* (Boelens et al 2006) *and Water, Cultural Diversity and Global Environmental Change* (Johnston et al 2012).

It is surprising that religious perspectives on water ethics are not better represented in the literature on water ethics. An important exception is the book, *Troubled Waters: Religion, Ethics, and the Global Water Crisis* (Chamberlain 2008) which addresses Indigenous, Asian, and Abrahamic (Western) traditions. The author, a professor of Christian ethics at Seattle University, concludes that, "Neither ethical principles alone nor religious traditions in themselves are sufficient for the tasks of developing a new water ethos or...water ethic. Principles without guiding motivations remain abstract...and religious traditions without principles cannot guide policies for practical action" (p. 9). Responding to this challenge, the World Council of Churches has developed an ecumenical Water Justice Framework, "to preserve and share water for the benefit of all creatures" (Smith 2017, p. 243). Based on 10 fundamental principles, the Framework is largely consistent with the 2015 encyclical letter of Pope Francis, *Laudato Si*.

My own approach to water ethics is presented in, *Water Ethics: A Values Approach to Solving the Water Crisis*, (Groenfeldt 2013) followed in 2019 with a second, revised edition

(Groenfeldt 2019). My aim was to lay out a comprehensive framework of water ethics based on five categories of values related to water (Environmental, Economic, Social, Cultural, and Governance). Specific water values identified within a given community context, such as a city or the inhabitants of a river basin, can be mapped into one or more of the five value categories to characterize the prevailing local water ethic. This "descriptive" water ethic can then serve as a basis for stakeholder dialogue to critique their water ethic, and develop ideas for improvements as an aspirational or "prescriptive" water ethic. My explicit aim was to stimulate the development of local water ethics charters that would articulate the ethical aspirations of the local community, and which could also serve as a basis for generating a global water ethics consensus (Ziegler and Groenfeldt 2017), which is discussed later in this article.

The field of Water Ethics today can be described as a main stem of "water ethics" proper, complemented by a number of new branches addressing normative dimensions of water governance. These branches do not self-identify as "water ethics" but promote strong norms that are ethics-like in character: (1) Water integrity, (2) Water stewardship, (3) Water justice, (4) Ecosystem services, and (5) Rights of Nature. These branches share the overarching goal of sustainability, emphasizing complementary aspects of this concept ranging from the institutional (Water integrity) to the social (Water Justice) and the environmental.

1.3. Five Branches Linked to Water Ethics

1. Water integrity. With roots in the anti-corruption movement, the concept of water integrity centers around transparency, accountability, and participation. Transparency refers especially to information about water infrastructure and service contracts as well as water data. Accountability refers to budget processes as well as the maintenance of professional standards of good practice. Participation refers to stakeholder engagement in water planning and policy decisions, and can also refer to direct management participation of water users in operating irrigation systems or urban water supply systems. The Water Integrity Network (http://waterintegritynetwork.net) is the institutional home of water integrity focusing especially on institutional capacity building of operators and decision makers in urban water supply systems (WIN 2016).

2. Water stewardship. Water stewardship has become the catchword for corporate social responsibility within the water sector. The CEO Water Mandate, a UN-affiliated initiative, and others within the business community have adopted the term to describe their sustainable water activities. For example, Business for Water Stewardship (http://businessforwater.org) partners with the National Geographic program *Change the Course* (http://changethecourse.us) which supports water conservation within the Colorado River Basin through "...services that catalyze business engagement and leadership in environmental water stewardship." (Business for Water Stewardship 2018). The Alliance for Water Stewardship (AWS, http://a4ws.org), a partnership of environmental organizations, businesses, research institutes, and others, has developed the Water Stewardship Standard, a detailed set of guidelines certified by trained compliance consultants. The standard is concerned primarily with environmental indicators but also includes some social justice and engagement indicators.

3. Water justice. While social justice has long been a recognized theme of water activism, there has been a more recent application of "water justice' as an overarching perspective on water (Zwarteveen and Boelens 2014; Harris et al. 2017; Sultana 2018; Boelens et al. 2018). What distinguishes water justice as a field is the reinterpretation of recognized moral concerns about water rights – such as intergenerational justice, water rights of Indigenous Peoples, and health impacts from water contamination whether from chemical spills, agrochemical runoff, mine tailings, oil and gas pollution, etc.. Water justice refers to the ways in which water is allocated to competing demands of agriculture, industry, cities, etc. and within each of these use sectors, who gets how much water and how safe is that water for people and nature.

4. Ecosystem Services. The concept of ecosystem services recognizes the broad range of benefits that society derives from natural ecosystems, and tries to measure the value of nature's services, typically in monetary terms. The approach has led to new appreciation for the economic value of recreation and non-consumptive uses of rivers, including their existence value and the role of protected areas as reserves of biodiversity (CAPNET 2016). While non-economic benefits such as spiritual communing with nature, or the pleasure of viewing the beautiful river, are theoretically included as ecosystem services, ascribing values to non-marketable benefits is challenging. The result has been an over-emphasis on economic values that can be measured and monetized, and an under-emphasis on subjective benefits that cannot be monetized (Boelens et al 2014).

5. Rights of Nature. No longer the exclusive domain of philosophers specializing in environmental ethics (e.g., Nash 1989; Boyd 2017), the idea that we should recognize nature's intrinsic rights has entered the constitutions of Ecuador and Bolivia, and it receives serious attention within the United Nations. In addition to inscribing rights of nature into national laws, another approach is to claim legal rights of personhood for rivers (Iorns Magallanes 2019) based on the precedent-setting personhood accorded to the Whanganui River in Aotearoa New Zealand (O'Donnell and Talbot-Jones 2018).

The net impact of these approaches – integrity, stewardship, justice, ecosystem services, and rights of nature – is an emerging discourse about how to think about water and how to respond to increasing water stress and climate change. "Integrity" in water governance is about cleaning up the governance process (anti-corruption and transparency), but it also begins to address professional integrity and governance outcomes. "Stewardship" is primarily an environmental concept, though it can also include issues of labor conditions and social justice. "Water justice" is about people in a broad context, including intergenerational environmental justice. Ecosystem services is, of course, environmentally focused, but the implications extend to economics and culture, while the deeper issue of "rights of nature" goes beyond environmental ethics per se to the ethics of respecting Indigenous cultures who view nature as sacred. It is no coincidence that the two countries to adopt "rights of nature" provisions into their constitutions, Ecuador and Bolivia, also have majority Indigenous populations.

2.0 Towards a Comprehensive Water Ethics Framework

Having considered these five branches of ethics-like schools of thought, we turn now to the emerging field of water ethics proper. Analyzing or "reflecting" on water values can be facilitated by a framework that focuses our reflection on particular domains or categories, and on the interactions across value categories. This process of ethical reflection helps in sorting out the values and deciding which are most or least important. But ethical reflection aims higher than merely establishing value hierarchies; it aims towards action: What values do we wish to express through the ways we manage water? In this section we consider three complementary ethical frameworks developed by (1) UNESCO and partners over a period of more than two decades, (2) Indigenous Peoples representatives in the course of international meetings over a similarly long time period, and (3) a coalition of groups involved in drafting a global Water Ethics Charter during 2013 to 2016.

2.1.1 UNESCO's Approach to Water Ethics

The 1998-2004 UNESCO-COMEST initiative on "Water and Ethics" identified a number of fundamental ethical principles (Brelet and Selborne 2004, pp 5-6) which have been incorporated unchanged in subsequent UNESCO statements including the 2011 report on *Water Ethics and Water Resource Management* (Liu et al 2011) and the 2018 report on *Water Ethics: Ocean, Freshwater, Coastal Areas* (COMEST 2018). These principles are the following (taken from Liu et al 2011, p. 17):

> **Human dignity**: for there is no life without water and those to whom it is denied are denied life;
> **Participation:** for all individuals, especially the poor, must be involved in water planning and management with gender and poverty issues recognized in fostering this process;
> **Solidarity:** for upstream and downstream interdependence within a watershed continually poses challenges for water management resulting in the need for an integrated water management approach;
> **Human equality:** for all persons ought to be provided with the basic necessities of life on an equitable basis;
> **Common Good:** for water is a common good, and without proper water management human potential and dignity diminishes;
> **Stewardship**: for protection and careful use of water resources is needed for intergenerational and intra-generational equity and promotes the sustainable use of life-enabling ecosystems;
> **Transparency** and universal access to information: for if data is not accessible in a form that can be understood, an opportunity will arise for an interested party to disadvantage others;
> **Inclusiveness:** water management policies must address the interests of all who live in a water catchment area. Minority interests must be protected as well as those of the poor and other disadvantaged sectors. In the past few years the concept of Integrated Water Management (IWRM) has come to the fore and the means to ensure equitable, economically sound and environmentally sustainable management of water resources;

Empowerment: for the requirement to facilitate participation in planning and management means much more than to allow an opportunity for consultation. Best ethical practice will enable stakeholders to influence management."

These principles are derived mostly from the UN Universal Declaration of Human Rights and the proclamation of the 1977 UN Water Conference which "formulated an international consensus on a number of policy and operational measures" including that, "all peoples ... have the right to have access to drinking water in quantities and of a quality equal to their basic needs" (Fallenmark 1977). This human right to water, as well as to sanitation, was endorsed by the UN General Assembly in 2010 and serves as a keystone principle In support for water justice locally, nationally and globally (Smith 2017).

2.1.2 Indigenous Water Ethics

The search for a comprehensive set of universal ethical principles about water has not been limited to the UNESCO-COMEST lineage that has descended from the Human Rights discourse. A parallel track (with some cross-fertilization) has been developed through meetings and statements of Indigenous Peoples organizations and initiatives of Indigenous leaders. The Indigenous Peoples Kyoto Water Declaration is perhaps the best known. The declaration was drafted not by any one organization, but by some 30 Indigenous participants from around the world attending the World Water Forum in Kyoto in 2003 (See Groenfeldt 2019, pp 175-177 for background). The Kyoto Declaration was initially communicated to the World Water Forum in a march through the conference center with the indigenous participants speaking the declaration in unison, followed by a press conference. Later the declaration was posted on various websites and is also included in the UNESCO publication, *Water and Indigenous Peoples* (Boelens et al. 2006).

Two sections of the Indigenous Declaration outline a set of universal ethics for water governance (though without using the ethics terminology). The first section, titled, "Relationship to Water" explains why Indigenous Peoples feel a responsibility to protect water ecosystems. Another section is labeled "Right to Water and Self Determination" and describes the rights and responsibilities of Indigenous Peoples to protect their cultural ways of life:

Relationship to Water

- We, the Indigenous Peoples from all parts of the world assembled here, reaffirm our relationship to Mother Earth and responsibility to future generations to raise our voices in solidarity to speak for the protection of water. We were placed in a sacred manner on this earth, each in our own sacred and traditional lands and territories to care for all of creation and to care for water.
- We recognize, honor and respect water as sacred and sustains all life. Our traditional knowledge, laws and ways of life teach us to be responsible in caring for this sacred gift that connects all life.
- Our relationship with our lands, territories and water is the fundamental physical cultural and spiritual basis for our existence. This relationship to our Mother Earth requires us to conserve our freshwaters and oceans for the survival of present and future generations. We assert our role as caretakers with rights and responsibilities

to defend and ensure the protection, availability and purity of water. We stand united to follow and implement our knowledge and traditional laws and exercise our right of self-determination to preserve water, and to preserve life. ...

Right to Water and Self Determination

- We Indigenous Peoples have the right to self-determination. By virtue of that right we have the right to freely exercise full authority and control of our natural resources including water. We also refer to our right of permanent sovereignty over our natural resources, including water.
- Self-determination for Indigenous Peoples includes the right to control our institutions, territories, resources, social orders, and cultures without external domination or interference.
- Self-determination includes the practice of our cultural and spiritual relationships with water, and the exercise of authority to govern, use, manage, regulate, recover, conserve, enhance and renew our water sources, without interference.
- International law recognizes the rights of Indigenous Peoples to:
  - Self-determination
  - Ownership, control and management of our traditional territories, lands and natural resources
  - Exercise our customary law
  - Represent ourselves through our own institutions
  - Require free prior and informed consent to developments on our land
  - Control and share in the benefits of the use of, our traditional knowledge.

2.1.3 Global Water Ethics Charter

The idea of formulating a global charter on water ethics was a recommendation from the 6th World Water Forum held in Marseille, France in 2012. The concept emerged from the ad hoc "Working Group on Ethics, Culture and Spiritualities" which organized a session to identify commonly shared value principles across religious, cultural, and philosophical traditions. The group noted that even well known ethical principles about water, environment, and social justice, whether derived from major religions, Indigenous cultures, or secular philosophy have had little influence on actual water policies. What was needed was the "recognition of spiritual and ethical values and principles and their consideration in decision-making process in the water sector" (IFC Secretariat 2012). By the following year (2013) a core group of three organizations -- French Water Academy, UNESCO's Division of Water Sciences, and Water-Culture Institute (based in Santa Fe, New Mexico) -- agreed to work together to develop a "Water Ethics Charter". Along with this core team, six other organizations and individuals joined the Steering Committee to get the process underway: Alliance for Water Stewardship, Botin Foundation, Club of Rome, Indigenous Environmental Network, Water Youth Network, and an individual expert, Amb. Magdy Hefny from Egypt.

In 2014, some two years after the Marseille Water Forum, the Steering Committee met at UNESCO-Paris to establish the broad framework for a water ethics charter and agree on aims and expectations. The process of developing the content of the charter relied on a list of experts compiled from the personal contacts of the Steering Committee members. These experts were sent a provisional outline of the intended Charter (Draft 1.0) with an

invitation to provide feedback about issues the charter should address and any other guidance. Some thirty experts submitted substantive comments which were then incorporated into a new version (Draft 2.0) as the first comprehensive draft of the charter. This draft was presented at the 2015 World Water Forum in Daegu, South Korea (World Water Council 2015:49). Though the intention had been to hold a series of regional consultations to further develop the Charter, funding constraints and staff changes precluded further progress. Draft 2.0 of the Water Ethics Charter is publicly available on the website of the Water Ethics Network (https://waterethics.org/the-water-ethics-charter/) and has served to stimulate both scholarly and practical interest, if not funding. The 2016 meeting of the International Society for Environmental Ethics (ISEE) in Kiel, Germany, devoted a series of sessions to presentations about the Charter, which were compiled into an edited volume, *Global Water Ethics: Towards a Global Ethics Charter* (Ziegler and Groenfeldt 2017). A summary version of the Water Ethics Charter is presented here:

Water Ethics Charter (Draft 2.0)

Part 1. Introduction
This Charter establishes the moral and ethical foundations to guide decision-making around the use of water and the protection of water resources and water-reliant ecosystems. The following General Principles should guide decision-making: (1) Precautionary Principle, (2) Water as a commons, and (3) Intergenerational Justice.

Part 2. Environmental Issues
We need an environmental ethic which will safeguard the integrity of water ecosystems in the face of unprecedented human pressures and climate change.
General Concepts: Water ecosystems have inherent rights, and intrinsic value.
Operational Principles: (1) maintain or improve the health of natural water ecosystems; (2) no net loss from current conditions.

Part 3. Economic Issues
Water has an inherent economic dimension, but transcends monetary value.
General Concepts: Water use should be reasonable and frugal, emphasizing reuse; Existing water stocks should be maintained; private ownership of water must be balanced with accountability to the larger society. Operational Principles: Water for basic human needs should be effectively free, whereas water used in economic activities should have a market cost.

Part 4. Social Principles
General Concepts: Water should be explicitly recognized as a commons and central feature of life for individuals and the larger society. Everyone has a right to safe water and a healthy environment.
Operational Principles: Promote universal access to safe water and sanitation; ensure water justice for all and especially future generations.

Part 5. Cultural and Spiritual Principles
Water and water ecosystems provide important cultural and spiritual meaning
General Concepts: Rights of indigenous and traditional peoples to live according to

their cultural traditions including economic livelihood strategies and religious ceremonies.
Operational Principles. Water infrastructure should accommodate customary cultural uses as a matter of priority and subject to “free prior and informed consent”.

Part 6. Water Governance
General Concepts: Incorporate whole watersheds; reflect the interests of all stakeholders; manage at the lowest practical level; priority to social and environmental responsibilities.
Operational Principles: Transparency, accountability, and stakeholder participation are central to good water governance.

2.2 Applying Ethics to Key Water Sectors

Given water's importance to so many sectors of life and economy, a number of normative frameworks have been developed for specific sectors. For example, the OECD undertook a 4-year initiative to develop a set of 12 principles on water governance (OECD 2015), while the International Water Association has developed 17 principles for water-wise cities (IWA 2018). In this section we consider four cases of applying ethics to particular sectors of water management: (1) Environmental flow standards that aim to ensure sustainable ecosystem function of rivers; (2) Agroecology as a water-saving and socio-cultural enhancing approach to agriculture, (3) A Water Ethics initiative sponsored by Swedish textile and fashion companies, and (4) The re-municipalization of urban water utilities to promote water justice.

All four cases of applied water ethics discussed in this section share the common feature of realizing "multifunctional" benefits including social, environmental, economic and often cultural (identity) and governance (local empowerment) features. This is consistent with the literature on multifunctionality projects suggesting that contributing to multiple sustainable development goals (SDGs) is likely to be more impactful than aiming very narrowly at one particular type of outcome (Netherlands Enterprise Agency 2016).

2.2.1 Environmental Flow Standards

An environmental flow is the natural water regime of a river, wetland, or coastal zone which maintains the ecosystem (Poff and Matthews 2013). There are both economic and ethical reasons for maintaining environmental flows. From an economic perspective, “Environmental flows provide critical contributions to both river health and ultimately to economic development, ensuring the continued availability of the many benefits that healthy river and groundwater systems bring to society” (Dyson et al. 2003). From an ethics perspective, rivers have intrinsic rights to exist, and we have an intrinsic responsibility to respect those rights (Boyd 2017).

Since the 1990s, the concept of environmental flows has been gradually incorporated into water laws from Europe to South Africa to Australia. Environmental flow policies were

introduced In Australia during the 1990s along with new institutional arrangements to hold and manage environmental water allocations, including programs to buy back water entitlements from water users and return the water to the environment (Le Quesne et al. 2010: 47–8). Normative standards for environmental flow were endorsed by participants at the 2007 Brisbane River Symposium as the Brisbane Declaration. This was the first consensus document on what the term should convey, and marks a turning point for elevating environmental flow to the status of a global standard that has become generally accepted (Arthington et al. 2018). A ten-year review of the Declaration at the 2017 Brisbane River Symposium reaffirmed the original principles, and added new statements about the importance of cultural heritage and "local knowledge and customary water management practices [which] can strengthen environmental flow planning, implementation, and sustainable outcomes" (Arthington et al. 2018: 11).

The related concept of *cultural flows* was also developed in Australia and refers to "water entitlements that are legally and beneficially owned by Indigenous Nations of a sufficient and adequate quantity and quality, to improve the spiritual, cultural, environmental, social and economic conditions of those Indigenous Nations" (Echuca Declaration 2010). Cultural flow can also refer to that portion of an environmental flow which accommodates a particular cultural practice that depends on certain flows, for example, to attract wildlife into the riparian forest, or to induce a certain species of fish to enter a floodplain pool. Adjusting the flow (volume and timing) of regulated rivers can often support locally important cultural practices. The meaning of the term "cultural flows" continues to evolve (Taylor et al. 2016) and can facilitate integration of the diverse cultural values of water (recreation, psychological wellbeing, aesthetic enjoyment, cultural heritage) into the water planning process.

2.2.2 Agroecology: Towards an ethical agriculture

Agroecology, an approach based on both ecological and social principles, is finally coming of age as a solution to the multiple challenges of climate change, sustainability, and social justice. Though the approach was formalized in the 1970s (Altieri 1985) as a counterpoint to conventional agriculture, it remained marginalized by vested interests committed to the high-input, industrial mode of growing food. Proponents of agroecology saw themselves as participants in a cultural transformation to bring society and nature back into alignment (Pretty 2002; de Schutter 2011). Today agroecology is in vogue, thanks to a revaluing of its multiple benefits (Rosset and Altieri 2017).

In his keynote address to the International Symposium on Agroecology in April 2018, FAO Director-General José Graziano da Silva noted that agroecology transcends the farm level, providing multiple economic, social and environmental co-benefits. He was joined in opening the Symposium by French Member of Parliament and former Minister of Agriculture, Stéphane Le Foll, who was instrumental in placing agroecology as the centerpiece of France's national agricultural policy. The significance of the French government promoting agroecology as main-stream policy is the demonstration that it is not a policy only for developing countries but for technologically advanced countries as well.

Agroecology will not necessarily produce more food than intensive industrial styles of farming, but the aggregate benefits of local employment, ecosystem resilience, carbon sequestration, public health (from nutritious foods grown without toxic chemical additives), cultural identity, and greater stakeholder involvement in agricultural decision-making support multiple SDGs (Casey 2016, Bruil et al 2019). Through its Scaling up Agroecology Initiative, FAO is advancing "a vision to bring agroecology to scale and transform food and agricultural systems to achieve the SDGs" (FAO 2018: 1).

2.2.3 Swedish Textile Water Initiative

The Swedish Textile Water Initiative (STWI) is a network of Swedish fashion brands working cooperatively to help their suppliers in India, Bangladesh, China, Turkey, and Ethiopia to adopt water-conserving measures. STWI grew out of the concern of one family-owned company, Indiska, to help its suppliers in India to treat the wastewater resulting from printing and dyeing cotton and silk textiles, which is a major source of water pollution. With technical support from Stockholm International Water institute, the initiative developed into the current network of 29 brands and 277 suppliers. The aim is no longer just improving the water footprint of the textile manufacturers in the supply chains, but transforming water use within the whole fashion industry. "The STWI guidelines are being promoted by brands that believe in acting responsibly and want to do so through suppliers that they have a direct relationship with" (STWI 2014:8). Though some very large companies (Ikea, H&M) are members, the policy clout of the initiative seems to owe its success to the network itself, more than to the individual companies.

2.2.4 Re-municipalization as a Water Ethic

The experience of the city of Cochabamba, Bolivia with water privatization during the late 1990s marks a turning point for the trend towards privatization of urban water supply utilities (Lobina 2017). Today there is a growing trend in the opposite direction of "re-municipalization". Two globally renowned cities that adopted this trend in the past decade are Paris and Berlin. Both cities have joined the ranks of 'Blue Communities" and promote the ethical principle of water as a commons and a public trust (Blue Communities Project 2016). Three steps are involved in becoming a Blue Community: (1) Recognizing water and sanitation as human rights,(2) Beginning or phasing out the sale of bottled water in municipal facilities and at municipal events, and (3) Promoting publicly financed, owned, and operated water and wastewater services

The citizens of Berlin voted in 2013 to buy back the city water utility which had been privatized by a previous city administration in the 1990s (Härlin 2017). As the new owners of the city's water utility, the citizens embarked on a community-wide planning initiative to devise a Berlin Water Charter stipulating key value principles that would guide the new era of citizen-led water governance (See https://berliner-wassertisch.net/ for details). The case of Berlin is one of the more dramatic water governance reforms, but it is not unique. The city of Paris took back its water utility in 2010 simply by not renewing the long-standing contract with Veolia and Suez, and creating a new public entity, Eau de Paris (Le Strat 2010). The Berlin Water Charter illustrates why public management of urban water supplies is clearly desirable if public sector governance capacity is strong. Public water service

provides important opportunities to engage stakeholders and empower them to forge a relationship to the water they depend upon every day. Here is a summary of the 4-page Berlin Water Charter:

1 General Principles
- Access to water is a human right
- Water must be affordable for all
- The water utility shall be a public corporation with no privatisation
- Governance will be transparent with close coordination of stakeholders

2 Social and Economic Principles
- water charges will be for actual costs, but not for profit
- Pricing model will take burden away from small consumers
- No private companies my be integrated into the water utility
- Drinking water quality must be maintained with no degradation

3 Environmental Principles
- Drinking water sources will be local groundwater and Spree and Havel Rivers
- Natural environment of drinking water sources will be maintained in good status;
- Organic agriculture is encouraged to reduce water pollution
- Surface waters and water protection areas will be developed in harmony with nature;
- Fracking and oil/gas extraction is banned in and around Berlin

4 Legal Principles
- This Water Charter is the basis for interpreting existing or new laws or provisions.

(Source: Berliner Wassertisch 2015)

3. Status and Prospects for a Field of Water Ethics

Can water ethics become an antidote to the inequities and injustices of the real water world? The dark side of the water sector features dams that destroy river ecosystems and flood the ancestral territories of Indigenous communities, and toxic mine spills that kill the fish that local communities depend upon. Yet there is a fairly strong consensus about the water values we should aspire towards.

3.1. The Global Consensus on Water Values

By distilling the values implicit in global and regional water statements we can distinguish five key value propositions representing a significant cross-cultural consensus: (1) nature needs to be kept alive (ecological function); (2) everyone has a right to water and sanitation (social justice); (3) water should be used responsibly in agriculture and industries (responsible use); (4) stakeholders should be involved in decision-making (participation), and (5) diverse cultural identities and understandings about water should be respected (Traditional and Indigenous cultural rights). These five principles constitute a conceptual foundation for envisioning and formalizing a shared water ethic.

1. Environmental values: Keep nature alive. The notion that restoring natural ecological functions is desirable is a central tenet of IWRM which assumes that ecosystem services have value, and are fundamental to water security and resilience (UNEP 2009). It is in the interest of humans that water ecosystems are restored to health.

2. Social values: The human right to water and sanitation. Access to safe drinking water and sanitation helps protect the safety of water supplies. It is up to individual countries to implement this right. The infamous case of contaminated water supplies in the city of Flint, Michigan is a reminder that, even in developed countries the human right to water cannot be taken for granted (Rothstein 2016).

3. Economic values: Responsible use. The recently popularized concept of "One Water" (Kirshen et al. 2018) highlights the fact that not only water, but also water values, are connected. The violation of social ethics in Flint had a huge economic impact, while the lead that poisoned the tap water also became an environmental problem as lead contaminated wastewater was released into nature.

4. Governance values: Participatory water governance. Participation is central to promoting financial and professional integrity (anti-corruption), transparency and accountability within the water governance system (WIN 2016). Indigenous Peoples' interests have been energized through the concept of free, prior and informed consent (FPIC) embedded within the 2007 Declaration on the Rights of Indigenous Peoples (United Nations 2008). The participation of Nature can sometimes be accomplished through the concept of legal personhood for rivers such as the Whanganui River in New Zealand (O'Donnell and Talbot-Jones 2018).

5. Respect the diversity of water culture. Indigenous communities typically regard their local lakes and rivers as foundational to their spiritual and cultural identity, while mainstream societies and most water professionals view rivers as economic resources to be tapped. Cross cultural respect is needed so that multiple worldviews about water values can co-exist in a politically amicable way.

3.2 Conclusions: Nurturing the Field of Water Ethics

Within the established water profession there is renewed interest in understanding water values to inform sustainable water governance (Garrick et al 2017). As water sustainability concerns continue to increase, interest in values is likely to increase as well, and there is some reason to anticipate a renewed interest in how ethics can help in sorting through conflicting, overlapping, and sometimes synergistic values (Groenfeldt 2019). The project of building a field of water ethics and the project of defining a new water ethic are very much intertwined. A new water ethic can only take form if there is a larger field of water ethics to nurture that project, while the field of water ethics cannot be created out of nothing; it needs to grow in response to a demand.

The good news for water ethics is that we are living in the Anthropocene, a high stakes epoch where humanity can ill afford ignoring certain ethical principles, such as precaution

and solidarity. Yet as budding water ethicists, we cannot responsibly sit back and wait to be asked for our advice. Part of an ethical response in times of crisis entails stepping up to offer what help we can provide. The field of water ethics will advance most effectively through engagement with the intractable ethical issues of water governance. Just as progressive corporations recognize a dual benefit in promoting basin-level water stewardship (Water risk is reduced while their social license to operate is enhanced), the project of water ethics faces a similar opportunity. By engaging with our water colleagues to help address practical water challenges we can enhance our own intellectual license to operate and advance the field of water ethics.

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