

The potential of eco-facturing to re-generate rural-urban balance through eco-villages and city hubs: promoting social and environmental justice through vocational education and training hubs

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The paper proposes an alternative cyclical economy based on eco-villages supporting urban hubs to re-generate rural-urban balance based on eco-facturing, to use Gunter Pauli's concept. Africa and Asia are two of the fastest urbanising areas globally.

The development of eco-villages supporting the 'one village many enterprises' concept currently applied in Indonesia relies on responsive design.

The development of eco-facturing using local products such as cassava for bioplastics, bamboo for biochar and fair trade, free range luwark coffee are discussed as three examples of ecofacturing that are currently being developed in Indonesia. The potential for eco-facturing to be applied in Southern Africa and Ghana is currently being explored using bamboo and cassava in appropriate areas and exploring a suitable cash crop. Coffee is one option, but many others such as red bush tea, aloes as well as a host of local herbs could be explored with Indigenous holders of wisdom. Some core design principles are suggested outlined by Christakis and members of Global Agoras community of practice and affiliates. **Saliency, trust and engagement** to protect *living systems and the people* who are affected need to be involved in the decision-making process

These principles are discussed in the paper together with the importance of 'being the change' through expanding pragmatism to consider the social, economic and environmental implications of choices. Systemic Ethical decisions honour 'freedom and diversity' to the extent that freedom and diversity are not undermined by power imbalances. The paper reflects on the content of two forthcoming volumes, namely:

- *Mixed Methods and Cross Disciplinary Research: Towards Cultivating Ecosystemic Living*. Springer, New York.
- *Democracy and Governance for Resourcing the Commons: Theory and Practice on Rural-Urban Balance*. Springer, New York.

The policy approach could be said to be informed by the principle of subsidiarity and Ashby's rule, namely that policy decisions need to be made at the lowest level possible *and* the complexity of design decisions need to match the complexity of the local residents. The papers in the two volumes make the case for residents to act as caretakers for local living systems. The paper maps out design principles and makes the case that all living systems are in constant motion and design needs to respond in ways that generate energy, rather than extracting energy at the expense of this generation and the next.

- Profit is nothing less than energy extracted at the expense of people and the planet. Alternative forms of organisation are possible to support ‘wellbeing stocks’ to cite Joseph Stiglitz.

Key words: design principles, vocational education and training, eco-villages and hubs, cyclical economy, cycles in nature, food webs, water flows

1. Introduction

The aim of the paper is to make the case that rapid urbanisation and the decline of regional areas poses a human security challenge. In two forthcoming volumes **an alternative approach** is detailed. The chapters in the two volumes cover hopeful case studies of ways to do things differently. The majority of the case studies are from Australia, Indonesia, Bangladesh and Africa. The rationale for this choice is that rapid urbanisation and the impact on human security pose a challenge for Australia and the region as stressed by Glasser and Barnes (2018). Additional case studies cover issues of displacement and loss of habitat in other regions.

The **upstream approach** to addressing the human security risk is to promote **re-generative integrated development in line with the proposed laws of ecocide** which protects all the inhabitants in a region. This is a multispecies approach.

The **downstream approach** is to address **the consequences of displaced inhabitants**. As Polly Higgins stressed in 2017 in her address to the Hague, 750 million people are at risk of displacement by 2050. In 2017 65 million are displaced. This excludes the other forms of displacement and extinctions that are occurring. Debra Bird Rose (Gibson, Bird Rose and Fincher, 2015), an anthropologist stressed in her work on extinction that we need to see ourselves as part of a living system.

The proposal for this paper is to develop an alternative way of living and being through developing eco-villages and enabling people to live, learn and grow in regional areas in order to build on their lived experiences to bring about a new transformation (Polanyi, 1966,1968).

The paper outlines the way in which we can live differently by understanding that production, consumption, re-production /re-generation need to follow a natural ecological approach, rather than the current approach to extracting profit at the expense of future generations. Production and reproduction need to be conducted in ways that do not exploit people and the environment. Exchange practices need to ensure that the interests of the few are not expended at the expense of the many.

In ‘Planetary Passport’, I propose a reframed form of governance which rests on supporting social, economic and environmental wellbeing monitored **from below** by engaged inhabitants of a region.

1.1. Area of concern and Rationale

Social, economic and environmental challenges are convergent. Most of the global urban population *will be located in Asia (52 per cent) and Africa (21 per cent)*, according to the UN

(2014: 11). The Asian and African demographic growth provides both a dividend and a liability. The potential for investing in social and environmental justice through job creation that protects people and the environment is the focus for the paper¹. The hypothesis is that highly urbanized regions face food and water insecurity and are at risk of becoming food deserts unless everyday strategies are explored with service users and providers to find better pathways to resilience and wellbeing for the most vulnerable members of the population. What potential pathways can promote opportunities and redress the food and water insecurity associated with a growing population of vulnerable people in highly urbanized regions and vulnerable regional areas where informal housing areas predominate? What can Australia contribute with Partner Organisations to mitigate risk and maximise plausible pathways to resilience and wellbeing ?

The paper draws on two volumes (summarised below) that go beyond critique to offer small case studies and pilots as alternative ways of doing, being and interacting. The volumes are based on papers presented at a multisite symposium as well as additional papers by authors with whom I collaborate.

The program of research conceptualizes new architectures for democracy and better governance through addressing the issue of a priori norms and a posteriori measures for transformation towards re-generative living and preventing displacement of people , plants, animals². The

¹ According to the United Nations World Urbanization Prospects (2014) in 2014, 54% of the world population was urban and by 2050, 66% of the world's population is projected to be urban if current trends continue. Better urban governance needs to ensure that cities remain liveable and sustainable during and after the development process. Another central concern that urban governance schemes need to consider is the balancing of resources to meet both state and individual needs and goals. Land usage, either for agricultural production or for urban development, strategies and policies needs to be well informed to ensure not only optimal production is achieved but also elements of justice and equity prevail for a balanced development. The UN estimates that 71% will be in cities by 2030 and 80% in urban areas by 2050 – if current rates are maintained (UN Report on Urbanisation, 2014, Rand Daily Mail, 26th May, 2015). The flow of people from the north of Africa where the population replacement rate is much higher than the 2.4% in South Africa is another area of consideration. The Council of Higher Education in Pretoria Report (2016:6) cites outdated statistics that nevertheless make it clear that the number of learners has increased from 90 000 in 1994 to a million or more in current enrolments (CHE (2015) based on Vitalstatistics : Public Higher education 2013, p3. The same report goes on to cite Department of Education Data that are also outdated and based on the 1996 census that the:

research developed in these volumes contributes to a new area: namely the commons as a process and a sense of connection to living systems, rather than as a resource ‘held in common’, to cite Bollier (2011)³:

- ***“The commons is not a resource.*** It is a resource *plus* a defined community *and* the protocols, values and norms devised by the community to manage its resources....
- ***There is no commons without commoning*** – the social practices and norms for managing a resource for collective benefit”.

Background

Based on the volumes, this paper covers some of the lessons and discusses the potential for setting up Vocational Education and Training that supports a green, regenerative economy. The discussion is informed by small pilots to address: complex health, housing and social inclusion and mitigation and adaptation to climate change. As such it makes policy recommendations on greening cities and the re-generation of regional areas through new architectures for democracy, governance and education. Case studies are based in Australia, Indonesia and South Africa and are summarised below. This paper also reflects on the mixed methods research conducted in Alice Springs and environs on behalf of Local Government in the Northern Territory. In Alice Springs social inclusion and reliance on the social wage resulted in working with The Tangentyere Housing Association and a number of organisations to build institutional capacity. The case was made for the need for more social inclusion through creating pathways to wellbeing which build social, economic and environmental potential (McIntyre-Mills, 2003) and

Context	<ul style="list-style-type: none"> • Displacement of people and animals • Unsustainable way of life – extraction of profit to the detriment of people and the planet • Increased levels of competition and risk faced by the most vulnerable • Growing populations, growing gap between rich and poor, increased urbanisation increased pollution and waste. • Neglect of food, energy and water • Competition for resources in an increasingly complex global economy • Food deserts
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³ 07/15/2011 “I am always trying to figure out how to explain the idea of the commons to newcomers who find it hard to grasp. In preparation for a talk that I gave at the Caux Forum for Human Security, near Montreux, Switzerland, I came up with a fairly short overview, which I have copied below...:<http://www.bollier.org/commons-short-and-sweet>”

to understand that wellbeing is dependent on the health of living systems of which we are a strand.

This was followed by participatory action research in South Australia with Neporendi. It was funded by an Australian Research Council Grant and several small grants which involved collaboration with NGOs and government departments and agencies. The case was made once again for more opportunities to maximise pathways to social inclusion that protect the environment and the River Murray. The outcome was the creation of a prototype for social engagement based on user-centric design (McIntyre-Mills et al, 2008) by with and for Aboriginal Australians. The prototype was shown in Canberra at the invitation of a federal government department and I was asked to scale up the design which initially comprised an NGO, a job club in the Southern Region and the Domestic Violence network. This led to my working with SA Local Government and members of the Local Government network which resulted in funded research on mitigation and adaptation to climate change by enabling residents in the local government areas of Marion, Unley, Burnside to consider the implications of everyday social, economic and environmental decisions on their carbon footprint. This research contributes to the concerns raised by Elinor Ostrom (2008) to find a way to operationalize ways to limit the size of our human footprints.

Simultaneously, I was supervising PhD students working on socio-economic and environmental policy concerns in a range of contexts which resulted in collaborations with PhD students and graduates. This resulted in setting up a community of practice (Wenger, 2009) to foster institutional capacity building which resulted in collaborative research in Indonesia as a facilitator. The research in Bandung and environs, particularly in Alam Endah (meaning Beautiful Place) on the potential for integrated development (in line with the One Village Many Enterprises Project) provided an example of social inclusion, vocational training and opportunities for employment that reduced outmigration (McIntyre-Mills et al, 2019).

A multi-site, cross cultural Mixed Methods Symposium was held in Adelaide and Bandung to explore the potential for vocational training, integrated development and ways to enhance the capabilities of institutions to develop ecofacturing by making use of environmental resources in ways that re-generate people and places. Three crops were explored, namely cassava for bioplastics, bamboo for biochar and building and ethical luwark coffee and fair-trade Indonesian coffee. The Alam Endah case study (McIntyre-Mills, 2019, forthcoming) demonstrates low rates of out migration as a result of community engagement in sustainable living and regenerative activities. The potential for women to be further empowered through enhancing their representation and accountability is explored.

Indonesia has a policy that fosters recycling as well as a policy on rural development. It is called the 'Jokowi one village one entrepreneurial project' to support poverty reduction. We explored examples of sustainability and then considered whether it could inform vocational education and training in South Africa. Collaboration followed on from the multi-site mixed methods symposium held in Australia (in line with Australia's Foreign Policy, 2017) and West Java which underlined the importance of collaborative research as equal partners in the so-called 'One Village, One Enterprise Approach' (2014) decreed by the President of Indonesia, Jokowi. Through creating a community of practice network at a post-national level, we have considered

the application of the ‘one village one enterprise’ notion in the South African context and we are learning from the experience in Indonesia.

A colleague from South Africa, Norma Romm attended the multi-site symposium which was also co-facilitated with Donna Mertens, invited to co-facilitate the symposium. This was followed up by setting up a community of practice with other colleagues in South Africa which resulted in our working together in range of ways, namely sharing resources and making suggestions as to how to foster opportunities in regional areas, such as Manyeledi in the North West Province (McIntyre-Mills et al, 2019). In this region, unemployment for young people in the 15-34 age group is one of the highest and it resulted in civil unrest in 2018 which required Cyril Ramaphosa to return from a visit in the UK, to address these concerns.

Manyeledi is an arid zone on the border of Botswana where goat farming has been extended by adding value to goats milk, turning it into cheese and developing some hardy herbs and vegetables that have enabled these resilient farmers to be less reliant on government social payments. Water and food insecurity is an issue in many parts of South Africa as is the need to address the rising challenge to provide education, training and employment. Currently, tertiary level education in South Africa is not meeting their demands. The opportunity to extend education and training in regional areas is thus worth pursuing in more depth. In Indonesia, Java the one village, many enterprises approach has been successfully applied in a regional area of Bandung with Vocational Education and Training support from the University of Padjadjaran.

Interest in marketing products has also been fostered in Kederi, East Java by a colleague who is part of this network (Wirawan and McIntyre, 2019) which explores the potential for village-based computing if funding could be obtained to support the project. The potential for the prototype pathways to wellbeing software to be developed with block chain could help manage the food chain and ensure decentralized and distributed control of legers (Kshetri, 2018). The aim of the research is to encourage the notion that we can earn while we learn and grow a future together and to explore relationships with service users to build the capacity of the providers and to provide a better understanding of what works, why and how with the hope that it will help to inform policy decisions.

2. Urbanisation in South Africa and Indonesia

Large city populations become unstable when living costs are unaffordable. It is not surprising that the so-called Arab Spring started as a result of rising food costs. In Solo, Indonesia riots occurred when living costs and cooking oil become too expensive for the small street traders to survive. The demographic dividend namely high population growth and the rising number of young people could become the trigger for political unrest in rapidly urbanising cities in both Africa and Indonesia where the rising levels of unemployment and poverty result in the vulnerability of women and children to crime and trafficking. The need to link positive vocational training with positive digital engagement through social, economic and environmental pathways to wellbeing is very important for human security. Training in ‘joining up the social, economic and environmental dots’ could be facilitated by the pathways to wellbeing software.

Critical systemic research explores wicked problems in terms of the 12 is/ ought questions (Ulrich and Reynolds, 2010) which need to consider social, economic and environmental dimensions together with those who are affected and involved. Wicked problems by definition are complex. They comprise many, interrelated variables that are perceived differently by different stakeholders and must be explored contextually (see Flood and Carson, 1993, Rittel and Webber, 1984, West Churchman, 1979, 1982). However, the collaboration across stakeholders needs to be guided by the axiom that: ‘We can be free and diverse to the extent that our freedom and diversity does not undermine the common good of both current and future generation of life’ (McIntyre-Mills, 2014). This axiom has been explored in depth in previous work (see McIntyre-Mills 2006, 2014, 2017). It explores the notion that our fate is determined by a realization of our interdependence. It aims to increase an understanding of life chances and dynamics of vulnerable population groups in areas most affected by climate change related areas. Significantly, the collection responds to complex ethical policy challenges posed by the Paris Agreement and the UN Sustainable Development Goals, in order to narrow the gap in living standards between rich and poor. Policy choices made by this generation shape the wellbeing of both current and future generations. The outcome of implementing VET programs to support an adapted version of ‘One Village , one enterprise’ (2014) adopted by the Indonesian president Jokowi could be a better understanding of socio-cultural discourses, life chances and behaviour to inform policy and to improve public administration by learning what does and does not work and why from the most vulnerable populations.

In line with the Paris (2005) Declaration and Accra Agreement (2008) on harmonising development goals, development needs to take into account the values of the participants, based on long term trust. Engagement to address educational challenges needs to address indigenous wisdom and to avoid colonisation.

3. Theory and key concepts

Key terms include affordance (Gibson, 1986) and dependence (Hodder,2012) and the need to create different relationships across production, consumption and re-generation, in order to understand the way in which power and knowledge (Foucault and Gordon, 1980) play out in the system of biopolitics (Foucault, 2008). Hannah Arendt emphasised the need to recognise patterns in behaviour, this is important for sociologists, but it is equally important to recognise the need to understand that human culture has the potential to adapt and change the environment, because of the scale at which the global economy operates. The Anthropocene is the product of human culture writ large. But by recognising the ‘banality of evil’ (Arendt, 1963) and the implications of the everyday choices we make, it is possible to do things differently. The way we think matters, it changes the way in which we relate to one another and living systems of which we are a strand. The assemblages we create through our desires can change. Our thoughts and emotions result in decisions and information that support cultural flows that re-generate our environment or lead to its de-generation:

According to Hodder (2012: 4):

“So, there are only flows of matter, energy and information (Deleuze and Guattari, 2004, Ingold, 2010).” Hodder stresses that our relationships with things are not static and that we can re-configure the assemblages. This requires the desire to do things differently, which requires a cultural shift in the way in which we currently live our lives. The point of the paper is not to rehearse the current challenges associated with living in the Anthropocene, instead it makes a case for doing things differently in a non-anthropocentric manner (McIntyre-Mills, 2014). The paper summarises some of the key points from two forthcoming volumes. Both volumes can be considered as sources of ideas for policy makers and those engaged in strategic thinking⁴ to protect and re-generate living systems by addressing ‘wellbeing stocks’ a concept adapted from Stiglitz et al. (2010: 15) to refer to a multidimensional measure of wellbeing. This requires re-framing not only economics but our relationships. Stiglitz et al 2011: 15 use a multidimensional measure of wellbeing spanning:

“1. Material living standards (income, consumption and wealth), 2. Health, 3. Education, 4. Personal activities including work, 5. Political voice and governance, 6. Social connections and relationships, 7. Environment (present and future conditions), 8. Insecurity, of an economy as well as a physical nature.”

The aim of the wellbeing stocks concept is to enable people to re-evaluate economics and to become more aware of the way in which we neglect social and environmental aspects of life. The pursuit of profit at the expense of people and the environment is a central problem for democracy and governance. The vulnerability of cities is a symptom of the lack of balance between individual and collective needs. Economic and environmental indicators of wellbeing were tested by means of a prototype.

In order to manage the commons mutual agreements need to be negotiated and records need to be kept, in order to protect the interests of stakeholders. The commons needs to be theorized as a legal concept (Marella, 2017) and as a transformative governance concept (see Planetary Passport (PP), McIntyre-Mills, 2017 and Systemic Ethics, McIntyre-Mills, 2014). The book ‘Planetary Passport’ provides a new epistemic narrative and responds to the 2030 Development Agenda by suggesting a way to enhance representation and accountability by extending the Millennium Goals and UN Sustainable Development Agenda. It reflects on studies of alternative

⁴ The critical systemic approach takes into account many diverse ways of seeing and tries to find common themes that could underpin ‘lives worth living’, based on testing out ideas with those who are to be affected by the decisions and mindful of future generations of life (including sentient beings). This is a form of expanded pragmatism based on mindful decision making in the interests of living systems of which we are a strand (McIntyre-Mills, 2017). We need to respond to systemic socio-demographic, cultural, political, economic and environmental challenges and the different needs of age cohorts in developed and developing and less developed parts of the world. Harper (2017) stresses that population change is below replacement levels in many parts of Europe where the population profile is one of low fertility and low mortality. So, population change needs to be viewed in terms of ballooning and shrinking populations. Added to this the life chances of young people need to be understood in different parts of the world.

Basic concepts include, wellbeing, democracy, subsidiarity, capacity building, critical systemic praxis and wicked problems, complex decisions need to be made by complex decision makers. Others are: cultural studies, critical systems thinking, Informatics and modelling complex systems, sociology and public policy, management systems and governance.

architectures for democracy and governance and suggests a way to extend local engagement in social, economic and environmental decision-making.⁵ Projects with potential are detailed in 'Balancing Individualism and Collectivism' and in forthcoming companion volumes for Contemporary Systems Series called : 'Mixed Methods and Cross Disciplinary Research Towards Cultivating Eco-systemic Living : We are the land and the waters' and 'Democracy and Governance for Resourcing the Commons : theory and practice on rural-urban balance to address loss and displacement.'⁶

Since completing the volumes, I have been researching the notion of human dependency on nature and the extent to which our entanglement with the things derived from a capitalist carbon-based economy have entrapped or blinded us to other options. The affordance of the niches created by successful crop production made it possible to specialise and industrialise. This has resulted in a way of life that is no longer sustainable. The production of goods in the current prevalent economy uses energy supplies that are largely unsustainable. The Aldani mine in Queensland Australia, for example will provide jobs at the expense of the environment (McIntyre-Mills et al 2019a) and will undermine the long term livability of the planet.

Use values that currently commodify people and the environment and consumption choices that ignore the opportunity costs are unsustainable. This approach is not inevitable, it is possible to do things differently. The cycle can be a closed loop, rather than extracting resources in ways that are destructive and lay waste to people and the environment, an alternative is possible.

Currently unemployment and lack of access to tertiary or vocational training are major human security challenges in a degraded urban environment. Highly urbanised, environmentally affected regions face the cascading social, economic and environmental challenges that impact on the habitat across the continuum from domestic, liminal, agricultural and wild animal life (to draw on Donaldson and Kymlicka,2011). The greater the use of participatory design processes to address complex problems, the better the problem-solving outcomes for service users and providers.

4. Aims, Praxis and Process

The message is that it is possible to do things differently!

⁵ The engagement processes (see 'Balancing *Individualism and Collectivism*', McIntyre-Mills et al 2017) that enable protecting the commons are explored in the companion volumes in which the rationale for a new way of living is developed with participants in Africa and Indonesia, where risks associated with displacement and loss are explored in more depth. The rationale for a more ethical form of representation and accountability to support cosmopolitan transdisciplinary approach is detailed in *Systemic Ethics* (McIntyre-Mills, 2014). Then in *Planetary Passport for Re-generation: knowing our place through recognizing our hybridity*' (McIntyre-Mills, 2017) a case is made that the commons could be protected through working across conceptual and spatial boundaries to enable low carbon, virtuous living in which resources are saved, re-generated to protect current and future generations of living systems.

⁶ These volumes are due for publication in 2018, based on our symposium in Dec hosted at Flinders and Uni of Padjadjaran. Colleagues from Uni of South Africa where I am honorary Prof also attended and have provided papers.

“Wellbeing is an idea whose time has come” (New Zealand Dept of Public Health, 2007) and this has implications for policy and practice. Participation helps to match policy with practice. In 2019 Jacinta Ahern has followed through on the notion that wellbeing indicators should be measured by government departments, in order to ensure that “clean air and water, access to housing and health care, education standards, economic mobility, social harmony and community safety, and a safe climate, is the core of work of government.” (Field, 2019:32)

Service users and providers need to work with stakeholders to draw on local wisdom and combine it with some of the new digital potential. Three core axioms underpin the research. These are informed by and contribute to 7 axioms from Global Agoras.⁷ **Salience, trust and engagement** to protect *living systems* need to underpin the decision-making process.

⁷ Participants included leadership by Ken Bausch, Tom Flanagan with participation by several colleagues including Norma Romm, Gayle Underwood. Leadership has continued through Peter Jones (2019) who sums up the seven axioms:

“1. The Complexity Axiom: Observational variety must be respected when engaging observers/stakeholders in dialogue, while making sure that their cognitive limitations are not violated in our effort to strive for comprehensiveness (John Warfield).

2. The Engagement Axiom: Designing complex social systems, such as for healthcare, education, cities, and communities, without the authentic engagement of the stakeholders is unethical and results in inferior plans that are not implementable (Hasan Özbekhan).

3. The Investment Axiom: Stakeholders engaged in designing their own social systems must make personal investments of trust, committed faith, or sincere hope, in order to be effective in discovering shared understanding and collaborative solutions (Tom Flanagan).

4. The Logic Axiom: Appreciation of distinctions and complementarities among inductive, abductive, deductive, and retroductive logics is essential for collective futures creation. Retroductive logic (referred to in design as backcasting) makes provision for leaps of imagination as part of value- and emotion-laden inquiries by a variety of stakeholders (Norma Romm, Maria Kakoulaki).” Contributions by McIntyre in the following publications (McIntyre-Mills, 2003, McIntyre-Mills, J., Bausch, K, Christakis, A. and de Vries, D. 2008, ‘How can we break the mould: democracy, semiotics and regional governance beyond the nation state’

“5. The Epistemological Axiom: A comprehensive human science should inquire about human life in its totality of thinking, wanting, telling, and feeling, as indigenous people and the ancient Athenians were capable of doing. It should not be dominated by the traditional Western epistemology that reduced science to only intellectual dimensions (LaDonna Harris and Reynaldo Trevino).” Contributions by McIntyre in the following publications McIntyre-Mills, 2008, 2017, User centric policy design, McIntyre-Mills et al 2014)

“6. The Boundary-Spanning Axiom: A science of dialogue empowers stakeholders to act beyond imposed boundaries in designing social systems that enable people from all walks of life to bond ...: Contributions by McIntyre in the following publications, McIntyre-Mills et al (2008a, b)

“7). A tradition within the community of practice is to identify the original contributor of the proposal by name, without reference to a specific work but by affirmation. Contexts of Co-creation: Designing with System Stakeholders 32 disciplinary barriers and boundaries, as part of an enrichment of their repertoires for seeing, feeling, and acting (Loanna Tsivacou and Norma Romm).” Contributions by McIntyre in the following publications McIntyre-Mills, J., Bausch, K, Christakis, A. and de Vries, D. 2008)

5. Proposed Future directions: from fragmented silos to food webs and water flows

West Churchman's Design of Inquiring Systems Approach (DIS) (1971) is applied to exploring what is the case, but the focus is on making policy suggestions as to how to address poverty and climate change linked with rural urban imbalance, a heavy carbon footprint causing water, food and energy insecurity. The demographic challenges of in Africa of a young population aged 15-24 facing high levels of unemployment can be addressed through integrated development and new forms of governance and democracy as detailed in McIntyre-Mills et al. (2019a, b)

The root metaphor of flows was used with Neporendi when undertaking research with care takers of the River Murray linked with Neporendi where I undertook research as part of an Australian Research Council Linkage Grant from 2004 (see McIntyre-Mills, 2008). The other (linked) metaphor of weaving strands of experience came about through conversations with the elders who explained the importance of the river grasses for removing salinity as the river ebbs and flows. The health of the Murray is dependent on the removal of toxins. The grasses can be seen to function as liver or kidneys. This has also been stressed by Weir (2009, 2015).

The idea that we now need to think of democracy in terms of weaving together strands of experience is important as is the notion of river grasses for removing salinity and water as a synecdoche of the sense of flow that the Intergovernmental Panel on Climate Change (IPCC) formula sums up to demonstrate that what we do in one part of society flows on to effect the environment on which we depend.

The binary oppositional thinking and commodification are core problems in Western neo-liberalism as stressed elsewhere (McIntyre-Mills 2014) which has implications for ethics and our relationship with living systems.

“The realisation of both environmental flows and cultural flows rests partly with whether we can reduce the powerful influence of separation thinking, and this is also what thwarts our ethics for living lives in connection. Cultural flows are quickly trapped in the contradictory constraints of separation thinking, and are more easily communicated as narrowly defined water allocation.” (Weir 2009: 119-129 cited in Weir, 2015)

5.1. Implications for governance and democracy

“8. The Reconciliation of Power Axiom: Social systems design aims to reconcile individual and institutional power relations that are persistent and embedded in every group of stakeholders and their concerns, by honouring requisite variety of distinctions and perspectives as manifested in the Arena (Peter Jones).”

	Ancient Public Administration	Traditional Public Administration	New Public Management	New Public Governance	New architectures for people and the planet
Accountable to	Subjects	Voters	Customers	Citizens	Living systems
Policy tool	Minimal	Direct	Contracting out	Co-production	Co-determination
Role of government	Rule	Row	Steer	Facilitate	Steward
Style	Royal	Post Autocratic Bureaucratic	Post Bureaucratic Competitive	Collaborative	Post national cosmopolitanism
Accountability	Leader	Hierarchy	Market	Network	People and habitat
Goal	Loyalty	Law	Results/performance	Relationships	Protection

Source: Column 6 is added to a diagram adapted from Zeger Van der Wal, Flinders Symposium, April, 2016

5.2. Progress to date on new architectures for democracy and governance

This section makes the case that critical agency is vital to understand, monitor and evaluate everyday social, economic and environmental strategies that enable a life worth living (Nussbaum, 2011). Two architectures for participation and scaling up governance are discussed. These new architectures for democracy and governance use readily available tools and software to link local learning communities with regional and post national regional partners and networks. The policies that could make this approach possible already exist (Florini, 2003, McIntyre-Mills et al, 2014, McIntyre-Mills, 2014, 2017):

New architectures to protect living systems and to support the global commons

	Structure	Process	Action
Micro-level individuals	UN local Agenda 21 (1992) and Aarhus convention (1998)	Questions raised and posed to local government by individuals	Local government, NGOS and individuals
Meso States and regions	Aarhus convention linked to global covenant	On line monitory democracy and governance to address state/market/civil society concern	Networking NGOs and INGOS to address representation and accountability
Macro Cosmopolitan governance	Legal structures to support the global covenant, Aarhus convention and Biospheres convention	International Criminal Court United Nations	Global action to pass laws to protect social and environmental justice in overlapping biospheres

Source Adapted from Florini (2003) and Archibugi in Wallace Brown and Held (2010: 322) cited in McIntyre-Mills et al. (2014:92) and McIntyre-Mills (2014: 7) in 'Reconsidering Boundaries', Sociopedia

Source: table 3.1. McIntyre-Mills, 2017: 148, 313 to address nodes (people, organisations) and to connect them to areas of shared post regional concern (Habermas,2001) through an on-line Planetary Passport (PP).⁸

The area of concern which a proposed 'Global Covenant' (Held, 2004) and proposed Planetary Passport needs to address is poverty, climate change, displacement of people and destruction of habitat. The PP could strive to balance individual and collective needs in line with a Global Covenant. Post national regions could be protected in the form of a nested governance system spanning the local personal level to the household, community, regional and post national regional level. This could (perhaps) be achieved based on co-creating pathways (McIntyre-Mills and De Vries, 2011, McIntyre-Mills and Wirawan, 2017) to map and manage local resource systems (Ostrom, 2008) in context 'from below' based on self-reflection (through critical heuristics questions) to prompt decision making (Jackson, 2000).

Stiglitz et al's (2010) wellbeing stocks could be supported by enabling people to 'be the change' on a daily basis through the way they choose to live their lives and making social contracts through the on-line system to protect local resource systems. Their footprint can be monitored locally, and they can generate transformation locally. The potential success of this approach is detailed (McIntyre-Mills and De Vries, 2011, 2014) and McIntyre-Mills (2019) explores the wider potential for redressing the cascading risks of climate change and how the way in which

⁸ See the demonstration of the pathways to wellbeing software at https://archive.org/download/pathway_DEMO_1/pathways_to_wellbeing <https://archive.org/details/VN860546> ethics and design The decisions are prompted by scenario guidelines. The daily living choices can be guided by means of an on-line engagement tool that helps decision making and enables the monitoring of social, economic and environmental choices. Positive and negative sanctions through monitoring could ensure that resources are fed forward to those in need and in the interests of future generations.

the management of risks was indeed achieved through the Cape Town Provincial Government's use of a transparent water management application that succeeded in getting people to change their water usage in a very short period of time. The 'monitoring from below' approach achieved control by the people of a scarce resource. The potential for further monitoring by means of pathways to wellbeing software to achieve social, economic and environmental outcomes for social and environmental justice can be achieved. This is a way to achieve re-generation with people in and beyond the usual structures of governance. This approach extends the social contract to ecological citizens who can log on to a new post national form of governance and democracy. It includes those who are currently excluded from citizenship – the young and the displaced.

6. Eco-village nodes and eco city hubs :The way forward?

Vocational Education in Rural Universities and Training colleges could help to promote the value of agriculture to students who could be tasked with the vital issue of food and water security. In order to enable lifelong engagement by active citizens requires action learning to address areas of perceived policy concern. The policy proposal is to develop more educational institutions that focus on teaching design skills from primary to secondary and tertiary level based on the blue economy and biomimicry in ways that draw on the lived experience of the learners. In rural and regional areas the local plant materials, for example could be used for developing a range of products, according to Pauli (2010) including cosmetics, cleaning agents, building materials, plant dyes, bio degradable plastics, to name but a few examples. In urban developed areas the blue economy could be used to recycle and re-use materials for building sustainable housing powered by sustainable energy and supplied with carefully collected rain water to support indigenous plants wherever possible in the urban environment.

VET curricula needs to address many ways of knowing spanning human logic, empiricism, dialectical thinking and pragmatism and extended to include spiritualism and appreciation of animal knowing, biomimicry and learning from nature. By valuing certain kinds of knowledge at the expense of others human beings have created a new age, namely 'the Anthropocene', characterised by rapid urbanisation and unsustainable development.

6.1. An ABC resource for VET training

The full ABC for ecological living can be accessed as Chapter 5 : "Policy Design for Vocational Pathways to Protect Biodiversity and Regenerate the Land. In McIntyre-Mills et al (2019) 'Democracy and Governance for Resourcing the Commons: Theory and Practice on Rural-Urban Balance'. A more detailed policy discussion can be found in an article 'Policy Design for Non-Anthropocentric Pathways to Protect Biodiversity and Regenerate the Land' (McIntyre-Mills, 2018). This section briefly summarises a priori norms *to promote and protect local knowledge creation* and a posteriori measures of *educational outcomes*. Indigenous knowledge needs to be

to ensure that it is placed at the heart of the curriculum⁹ to remedy the loss of appreciation of the spirit of Ubuntu and Ukama, meaning that people are people through others and through their connection to the environment (according to Murove, 1999, 2005 cited in Romm, 2017) where she explains:

“Murove refers to the African concept of *Ubuntu* (translated as “I am because we are”) and relates this to the Shona concept of *Ukama*. He explains that *Ukama* means: being related and interrelated, whereby human well-being and the well-being of everything that exists is understood in terms of interrelatedness. Relationality is seen as indispensable to the well-being of everything. (2005, p. 151)

The chapter from which this section is drawn reflects on some of the aspects of an educational program that responds to the call for an African Renaissance (Mbeki, 1999, Sesanti, 2016). In South Africa people have lost faith in the state because the elites in the public and private sectors are not accountable to the people they serve. The price of inequality—national and global—has escalated. The gap between rich and poor grows globally and in South Africa. The challenges are as follows to:

- **Design** places of learning to **match the educational content** to the **contextual needs** of a growing population in need of sustainable employment in livable biodiverse environments.
- **Sustain** a system of education to prepare people across the life cycle to **protect diversity** and the land on which we depend.

In order to address wicked, convergent problems we need to address education to meet the needs of the big issues of the day – poverty, climate change and competition for resources.

Educational institutions should also be practical, based on providing conducive conditions for *being the change*. The next step is providing the necessary curriculum that aims to protect people and the planet through understanding that *we are all living systems*. This requires stewardship of current and future generations of life through everyday thinking and practice that enables people to become ecological citizens through respecting one another including the multiple species of which we are stewards. The notion of living systems is one held by First Nations around the world, for instance, in the words of Hume (2003, pg. 239, who cites Rose Bird):

“The Dreaming, expressed through myth, ceremony, and song cycles, demonstrates that the cosmos constitutes a living system. The goal of this system as a whole is to reproduce itself as a living system, and this goal is attained by each part of the system maintaining a balanced relationship with all other parts. The balance is achieved by each part being aware of the other parts and acting morally toward one another. Deborah Bird Rose (1987, 263) explains this as a “reflexive moral relationship of care” between all things, both sentient and non-sentient: humans, animals, sun, earth, wind, rain. In sum, all that is included in this system. Other consciousnesses exist, have their own ‘cultures’, and are subject to the same moral principles of response, balance, symmetry, and autonomy.”

⁹ <http://www.sanews.gov.za/south-africa/former-president-mbeki-appointed-chancellor-unisa>

The development of eco-villages supporting the ‘one village many enterprises’ concept currently applied in Indonesia relies on responsive design informed by the principle of subsidiarity and Ashby’s rule , namely that policy decisions need to be made at the lowest level possible and that the complexity of design decisions need to match the complexity of the local residents who act as caretakers for local living systems.

Ecofacturing	
Nature	Local products
<ul style="list-style-type: none"> • Sun – solar power • Water vortices for power • Earth – seeds • Wind - power 	<ul style="list-style-type: none"> • Cassava for bioplastics, bamboo for biochar and fair trade, fair range luwark coffee are three examples of ecofacturing that are currently being developed Indonesia.

Piketty (2015) stressed the importance of data on money trails and wealth to ensure fairness and reciprocity in his 13th Nelson Mandela Address. Although transparency is vital for public trust a further step is required, namely the need to protect the environment through everyday decisions, as stressed previously by Wangaari Maathai in the 3rd Nelson Mandela Lecture. This requires:

- **Addressing** resilient urban, rural and regional infrastructure by
- **Exploring** the implications of urbanisation, loss of territory, water insecurity¹⁰, loss of species and the implications for living systems of which we are a strand.
- **Focusing** on the challenge of creating jobs that protect people and the environment
- **Developing** options for responding and adapting to the impacts of environmental change’ and
- **Contributing** to expanding knowledge through studies of human society by exploring culturally diverse ways of caring and stewardship through fostering values that protect biodiversity for social and environmental justice .

A is for a priori norms and a posteriori measures to promote Ukama (African non-anthropocentrism)

¹⁰Waughray, D. (2017) Water, energy-food: can leaders at Davos solve this global conundrum? Huge demands for water present complicated challenges, but leaders will not resolve these kinds of interconnected risks without a systems approach <https://www.theguardian.com/profile/dominic-waughray>
<https://www.theguardian.com/global-development-professionals-network/2017/jan/16/water-energy-food-challenge-davos>

The key concepts for a transformative educational approach need to be based on non-anthropocentrism. This means focusing on ways to protect the habitat of all living systems. The approach takes the next important step in the research agenda, to link the notion of relationships across humans, animals and the land as a source of Indigenous and non-Indigenous wellbeing and the broader societal need for environmental protection and effective ecosystem management of domestic, liminal and so-called wild or natural habitat (Donaldson and Kymlicka, 2011).

A priori norms to govern South Africa need to be adapted and extended to protect a habitat protected for human and animal life where three locations are available, namely:

- **Domestic spaces** for human beings and animal life that can co-exist
- **Liminal spaces** where domestic and suburban areas give way to shared spaces that enable life
- **Wild spaces** protected for animals and *their* habitat.

A posteriori measures are based on what works why and how and what the consequences of a particular policy decision would be people and the environment. As such a priori norms provide benchmarks and a posteriori measures ensure accountability based on a broad range of indicators of education effectiveness to enhance educational pathways. Policy guided by pragmatism takes a consequentialist approach based on considering the meanings of the ideas and practices for the majority of stakeholders. It is a *posteriori* approach and it takes into account the points of view of the stakeholders in specific contexts. Pragmatism can be divided into ‘*narrow pragmatism*’ that considers the majority, but not all stakeholders.

At the other end of the continuum of pragmatism is ‘*expanded pragmatism*’ that considers the consequences for all life.

Narrow pragmatism is based on thinking about the consequences only for ourselves and not others. It leads us to believe that our power and profit must be driven by self-interest and that the bottom line, namely ensuring our powerful positions and our profits. We tend to think that social and environmental considerations are ‘externalities’, rather than embedded in the current system.

Expanded pragmatism (EP) is the capability to think in terms of the consequences for self, others (including sentient beings) and future generations of life. It has much in common with idealism in that it considers the consequences for all life. It also has much in common with virtue based ethics in that it is based on dialogue with those who are to be affected by decisions and with the rights of future generations in mind. The way to teach ethical thinking is to help people to learn through engaging in practical learning to address everyday challenges. This is action learning which Denzin (2000: 567) defines as a problem-solving technique that:

‘Engages people’s concrete experiences to explore the current situation, clarify the purpose of the organization and removing obstacles to achieve effectiveness and efficiency’

Learners can be facilitated to engage in a self-reflection to assess what works, why and how and equally important what does not work and why. An Action Learning Approach that supports ‘planning for country’ (Walsh, 2002) can be used to explore how to care for country. It can be used to engage with all the stakeholders so they decide on areas of concern, frameworks and methods. Social and environmental justice are central to new participatory architectures for democracy and governance (Mertens, 2016, Romm, 2017).

The curriculum needs to enable learners to understand that living systems are interconnected. Human beings are linked with other animals and the land as a source of wellbeing. This is why Indigenous people say ‘we *are* the land’!

Rose Bird (1992) stresses that relationships with animals and nature help mutual survival in the Australian desert. Rose (1996, 2004, 2005, Gibson and Rose, 2015) explains in her publications and website how the land nourishes the body and that it is the best medicine. Without the land ‘as mother’ we face extinction.

B is for boundaries that support social and environmental justice and for protecting biodiversity

Taking a policy decision needs to be based on an ongoing policy process based on drawing and re-drawing boundaries.

Biodiversity is the focus for a new approach to economics developed by Gunter Pauli (2010). He outlines more than 100 ways to create opportunities through environmental thinking that does not privilege the environment at the expense of people. Instead his approach is to find ways to enable the unemployed to benefit through working on environmental challenges. His motto is: ‘There is no unemployment in eco-systems’ (Gunter Pauli, 2016)¹¹. He stresses the need to provide integrated opportunities through design that taps into the abundant talent and environmental opportunities that can be found and to ensure that the designs protect both people and habitat. This is a systemic approach that could ensure that people come up with solutions that do not create binary oppositions between people and the environment. It is unnecessary to argue that for people to flourish the environment must suffer. Sustaining the social and environmental fabric of which we are part ought to underpin our policy designs for governance. Participatory action research on democracy and governance to enhance sustainable living and wellbeing are discussed in the ‘Contemporary Systems Series’ (McIntyre-Mills, 2014, 2017; McIntyre-Mills et al., 2014, 2017) which explores the suggestion made by Florini (2003) in ‘The Coming Democracy’ that the Aarhus Convention (1998) on freedom of environmental information and participation could be usefully extended to support the nexus between sustaining human and environmental wellbeing and resilience.

“Nature does not calculate cash flow. While we are obsessed with monetarization (to our own benefit) natural systems generate multiple revenue flows best measured in protein, drinking water, energy resources and defense systems. Nature produces benefit through the calculation of integrated benefit flow....” (Pauli, 2010:235-6).

The VET engagement process needs to explore the different life chances across age cohorts and the need to ensure that the life chances of young people from low- or no-income families are placed uppermost in the policy decisions. The so-called ‘cascade economy’ conceptualized by Pauli (2010) is based on emulating nature. The following ideas (and more) are explained by

¹¹ <https://www.speakersassociates.com/speaker/gunter-pauli> Accessed 20/12/2016

Gunther Pauli (2010) and William McDonough¹² who developed the Hannover Principles to encourage better design for living in 1992:

Imagine a block of flats design to follow natural flows. Rain falls and is collected on roof top gardens where rain tanks channel water for drinking, grey water can be used to flush toilets and filtered to be re-used for growing food. Gardens could be extended to sides of building, on bridges across buildings and in basements. Natural materials could be used, such as mud, cow dung, thatch, bamboo. Termite mounds could be used as templates for designing air flow and maggots could be used to process waste.

- **C is for culture, caring for country and the common good rather than buying in to commodification through addressing complexity**
- **D is for democracy and design to address complex , diverse needs**
- **E is for engagement with diverse stakeholders to address social, economic and environmental justice and to achieve emergence**

Engagement with diverse stakeholders needs to address social, economic and environmental justice and extreme forms of consumption that undermine wellbeing and relationships. **Emergence refers to** the ability to escape the trap of our own thinking, to cite Vickers in Beer, 1994: 252: ‘the trap is a function of the nature of the trapped.’ According to his theory of ‘recursive consciousness we are able to emerge from our entrapment through making connections and realising that we have the capability to achieve transcendence as we become more conscious. One way out of the trap is to become more creative in our thinking and more open to learning from the environment, even if we do not mimic it!¹³

F is food, friendship and facilitation of a new economy that prevents the financialisation of systems and a recognition of flows of information and energy

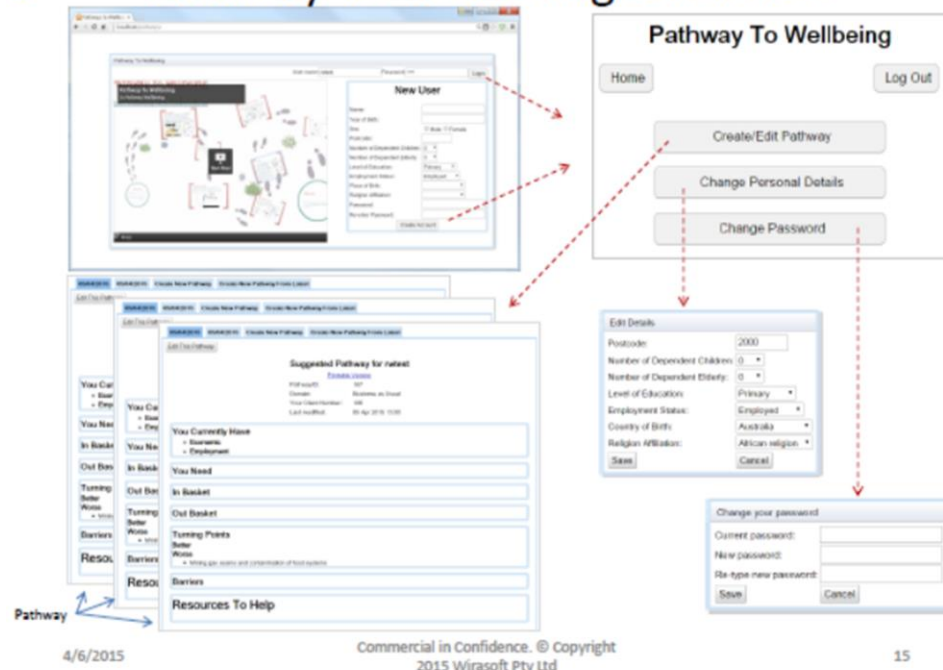
The ability to work with many ways of seeing requires the ability to think about multiple texts and contexts and to develop a way to respect situated knowledges to the extent that the approaches do not undermine the rights of others or the environment. This can be achieved through a recognition of flows.

¹² http://www.archdaily.com/804110/william-mcdonough-on-sustainability-carbon-is-not-the-enemy?utm_medium=email&utm_source=ArchDaily%20List

¹³ According to the biomimicry website: “Biomimicry is an approach to innovation that seeks sustainable solutions to human challenges by emulating nature’s time-tested patterns and strategies. The goal is to create products, processes, and policies—new ways of living—that are well-adapted to life on earth over the long haul. The core idea is that nature has already solved many of the problems we are grappling with. Animals, plants, and microbes are the consummate engineers. After billions of years of research and development, failures are fossils, and what surrounds us is the secret to survival”.



Pathway To Wellbeing Overview



https://ia801606.us.archive.org/20/items/pathway_DEMO_1/pathway_DEMO_1.mp4

An ABC of aphorisms for social and environmental justice

<ul style="list-style-type: none"> • A is for Anthropocentrism and affordances • B is for boundaries and biospheres • C is for caring about consumerism • D is dualistic us/them thinking • E is for energy and ethics, emergence and entanglement • F is for food and friendship • G is global commons and green economics • H is for human rights • I is for intermeshed, interconnected fate • J is for justice • K is for knowledge • L is for living systems, listening and for lack of accountability 	<ul style="list-style-type: none"> • M is multiple methods • N is for Non anthropocentrism • O is for open borders • P is for planetary passport and protection • Q is for questioning • R is for resilience and rights • S is for spirituality • T is for transformation • U is for Ubuntu and Ukama • V is voices • W is for world view • X is for xenophobia • Y is for Youth • Z is for zero sum approach
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G is for governance to protect the global commons

Governance refers to working across conceptual and spatial boundaries to protect food, energy and water security. This is vital as a first step towards preventing poverty. Governance needs to address the big issues of the day, namely poverty and climate change by protect biospheres, rather than merely protecting national interests in a ‘zero sum’ approach. Governance needs to be fluid, systemic and organic.

Global commons refers to earth, water, the air that we breathe and genetic material that is the basis of living matter.

H is for habit and hybridity (McIntyre-Mills 2017)

I is for Indigenous, Innovation, integrated responses, access to information

Indigenous people and **Indigeneity** are concepts that can empower or be used to disempower. Indigenous groups exist in different circumstances, some have political rights in the form of treaties or constitutional recognition, some have land rights (often hard won through years of litigation), some have limited cultural rights and recognized limited political representation. Some have none of the above, some are not minority groups, but they have survived a history of colonization and prefer to see themselves as Indigenous. This is why the United Nations GA

2007; Resolution 61/295 of 13 September enables self-identification. This is certainly the case in South Africa where the majority African culture describes itself as 'Indigenous' not just the smaller minority groups like the San and Khoi. In South Australia leadership based on 'speaking as country' is a growing movement in recognition of Indigenous was of knowing and being based on an appreciation of our interconnectedness. Innovation is the result of drawing on lived experiences to address local problems with local knowledge

J is for justice and K is for knowledge management

Justice can be addressed through acknowledging the increased levels of inequality' at a national and global through a design for social and environmental justice.

L is for listening to address the new democratic deficit (Dobson, 2012).

Conclusion

Those who live sustainably could be rewarded through measuring their low impact and be afforded points on a resilience scorecard that indicates transparently what a low footprint they have and the extent to which they are contributing to socially, culturally economically and environmentally. Bonus points are rewarded in the form of social status advertised in the form of local government honours lists and in the form of a social and environmental wage for those who are actively engaged in protecting their local community and thus contributing to the 'one people and one planet philosophy'. Practical engaged citizenship is the way forward, but it needs to be promoted through immediate feedback to promote realistic rewards, most importantly a way to earn a sustainable living.

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