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CHAPTER 6

Systems Intelligent Environmental Leadership

Pentti Viluksela

As a result of increased human impact, environmental problems and challenges are becoming more and more commonplace worldwide. Many of these problems are large and complex, transcend national boundaries and involve many different stakeholder groups. New environmental leadership is needed to resolve conflicts and find acceptable and sustainable solutions to problems. Systems intelligence may contribute to not only achieving compromises in complex situations, but also to creating a powerful way of working together towards new and sustainable solutions.

Introduction

Hurricane Katrina causes destruction in New Orleans. Persistent droughts have a devastating effect on people's lives in many parts of Africa. Heavy flooding causes human suffering and material losses in East Africa, China and Central Europe. Oil spills from shipwrecked tankers or war-torn refineries pollute ecosystems. The ozone hole above Antarctica is getting larger, while the increased ground level ozone concentrations lead to health problems in industrialised cities. The shrinking ice cover around the North Pole is threatening to disturb the balance of the Atlantic currents. The list continues into the haze of smog in the horizon.

It seems that the environmental capacity of our planet is reaching its limits in many different ways. There is a consensus among the scientific community that the activities of man are the cause of a significant part of the problems. Regardless of the reasons, the environmental forces are causing human suffering, and the disadvantaged third world communities are those hardest hit. Can we do something to improve the situation?

The problems and threats facing mankind are so big that they could be assumed unsolvable. However, looking at it from a systems intelligence point of view, the problems can be regarded as challenges – big, but solvable. Minor interventions can lead to major changes in the system. By studying the systems and their dynamics, we may be able to recognise and make the necessary interventions leading to the desired changes.

To enable and facilitate the changes, we need effective environmental leadership and leaders. Up to now, too little attention has been paid to the concept of environmental leadership. To solve the environmental challenges, we need concerted action on many levels and fronts. To design, initiate

and coordinate that action, we need systems intelligent, visionary and result-oriented leadership. Gordon and Berry (2006) have defined environmental leaders as people who are capable of solving environmental problems. Thus, you and I have the potential of becoming environmental leaders, at least in our own, often small, systems. Business executives, public administrators, politicians, investors and environmental activists have the same potential of environmental leadership on a larger scale. Systems intelligence can help us all to realise that potential.

Environmental Challenges of Our Generation

What are the problems and threats faced by mankind? Jared Diamond (2006) has analysed the collapses and survivals of past societies, and claims that most collapses have been caused by environmental problems. He draws a list of the twelve most serious environmental problems facing us today; these are summarised in TABLE 1 below.

TABLE 1. The most serious environmental problems of today.
(Summarized from Diamond 2006, pp. 487–496)

Group	Problem	Notes
Destruction or loss of natural resources	Destruction of natural habitats	E.g. deforestation
	Declining sources of wild foods	E.g. over-fishing
	Diminishing of biodiversity	Extinction of species has an impact on whole ecosystems
	Damage to soil	E.g. erosion, salination
Ceilings (soft ceilings that can be extended but only with increased costs and impacts)	Ceiling of easily accessible energy resources	Extraction of oil and gas from sources deeper underground will be more expensive and cause more environmental impacts
	Limited freshwater resources	Increasing utilisation of water for irrigation and industry and the expenses of desalination
	Photosynthetic capacity	Less sunlight available for natural ecosystems as more is used or "wasted" by man
Harmful substances, species etc.	Release of toxic chemicals into the nature	E.g. pesticides
	Release of alien species	E.g. rabbits in Australia
	Emission of greenhouse gases	E.g. carbon dioxide and ozone depleting substances contribute to climate change
Population increase	Growing global population	Growing requirements for food, space, energy and water
	Increasing living standards of third world population	First world citizens use 32 times more resources and produce 32 time more waste than third world citizens

One might ask which are the most important of these problems, and concentrate on solving them. The shocking news, according to Diamond (2006, p. 498), is: all of them are crucial, – we have to solve every one of them. This statement reveals the magnitude of our challenge. We can also see that it is not only environmental and ecological issues that need to be addressed. We also need to

look at financial, social and human factors. The systems under observation must be expanded to include all these relevant areas.

To facilitate our search for solutions to these challenges, we should observe the key characteristics of environmental problems. Gordon and Berry (2006) identify six factors that make environmental challenges particularly difficult to solve:

(1) Most environmental issues have a very long time frame.

(2) They include complex interactions of natural and man-made processes, where people also play a central role.

(3) The scientific base for understanding the problems can be weak and scattered.

(4) Dealing with the complex issues requires integration and exchange of knowledge across different disciplines.

(5) The attitudes of the different stakeholder groups can be emotionally charged and confrontational.

(6) Surprises and unintended consequences are often encountered along the way.

Thus, decisions related to the environmental problems need to be made now, based on incomplete scientific data and trying to resolve the conflicting interests of many stakeholder groups. The problems themselves are complex and long-term, affect more or less every living being on Earth, and are caused by a changing combination of human activities and natural processes. Systems Intelligence can be a helpful decision-making tool, since its basic assumptions and key ideas fit the above characterisation well (Hämäläinen and Saarinen 2004, 2006). Especially promising are the factors dealing with human sensitivity – mental models, beliefs, co-operation and change.

Overcoming the Causes of Collapses

What factors enable a society to survive? Diamond (2006, pp. 421–437) proposes four main categories of factors that can drive societies towards collapse.

- A society may fail to anticipate a problem before it arises: This may be caused by lack of experience or by using false analogies.
- A society may fail to perceive a problem once it arises: The problem can be imperceptible, concealed by normal fluctuations or too slow or distant to be noticed.
- A society may fail to solve a problem after perceiving it: The decision-makers may ignore a problem affecting others but not themselves (so-called rational behaviour), consider other values – e.g. economic, religious – to be stronger than the environmental threat (so-called irrational behaviour), or the problem may be related to a common resource that is over-used (known as tragedy of the commons).
- A society may try to solve a problem but does not succeed: the problem may not be solvable with the resources available.

It seems that our present-day society is well equipped to deal with the first two categories. Environmental awareness and scientific progress have put us in a good position to anticipate and perceive forthcoming problems. In order to reach the fourth category, we have to overcome the third, which is the real challenge. This is where systems intelligence can make an impact.

Environmental issues are sometimes pushed aside by more important, often shorter-term, issues. Economic arguments have been widely used. George W. Bush, president of the U.S.A., refused to sign the Kyoto treaty, claiming "that adhering to the Kyoto treaty on climate change would have 'wrecked' the U.S. economy" (MSNBC 2005). However, according to the Natural Resources Defence Council (2005), "the White House Council of Economic Advisors concluded that the costs of implementing the Kyoto Protocol would be 'modest' – no more than a few tenths of 1 percent of gross domestic product in 2010". Another study by the Department of Energy shows that increased energy efficiency would make the US not only comply with the Kyoto Protocol but even improve its economic performance in the long run.

Another case of economic versus ecologic and social interest is the utilisation of the forests in Northern Finland. The landowner, the Finnish state, wants to make economic gains by logging and selling the wood to the paper industry. The indigenous Sámi people want to preserve the forests, since they provide food and shelter for the reindeers. Environmental organisations side with the Sámi, emphasising the role of the forest in protecting biodiversity. Systems intelligent approaches to solving these conflicts have been studied and proposed (Kyllönen et al. 2006, Siitonen and Hämäläinen 2004).

On an individual level, many people are strongly in favour of environmental protection as long as it does not affect them personally. Finnish people consider car-sharing environmentally friendly, but do not themselves want to practice it. Incineration is regarded as a good solution to treat household waste, provided that the plant is located "not in my back yard" (the so-called Nimby principle).

To achieve solutions to environmental problems, our attitudes and values need to be re-examined and changed. There are many encouraging examples of major changes, initiated by changes in values or beliefs and powered with small actions. Let us look at some cases where the mechanisms for major changes are demonstrated, and try to learn from them.

Little Interventions, Big Effects

The Nobel Peace Prize of 2004 was awarded to Wangari Maathai, environmental activist and founder of the Green Belt Movement in Kenya in 1977. Her movement responded to the problem of rural communities no longer being able to sustain themselves due to the degradation of the environment and the effect of commercial farming. The needs were expressed by women, the primary caretakers of rural families, most sensitive to environmental damage. The movement started to plant trees – a simple and attainable activity leading to quick results. Trees provide energy, shelter, food as well as income to support household needs and children's education. Trees also create employment, improve soil and prevent erosion. Through tree planting, the participating women were empowered to address their own problems and improve their lives – a revolutionary thought for people who have been led to believe that they lack the capital, knowledge and skills required to improve their lives without external assistance. (Maathai 2004)

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The movement not only awoke the awareness for the environment and the hidden human potential, but also discovered the strong connection between environmental responsibility, democracy and peace. The tree became a symbol for human rights and resolution of conflicts. Citizens were encouraged to overcome fear and helplessness and to defend democracy by challenging corruption, abuse of

power and mismanagement. The commitment of the civic society organisations, including the Green Belt Movement, led to a peaceful transition to a democratic government in 2002.

In 1974, Muhammad Yunus lent the sum of 27 $ to 42 poor villagers in Bangladesh. Since commercial banks considered the poor not creditworthy, Yunus established Grameen Bank (Village Bank) in 1983 to give collateral-free credits to the poor. The bank's activities have proved to be a cost effective way to fight poverty. Today the bank also accepts deposits, provides other services, and runs several development-oriented businesses including fabric, telephone and energy companies. In 2006, Yunus and Grameen Bank shared the Nobel Peace Prize (Yunus 2006). Prof. Yunus has recently been asked to enter into politics to "save the nation", and to establish a Grameen Bank in China (Ramesh 2007).

The fact that a banker and an environmental activist received the Nobel Prize for Peace – not for Economics or Biology – underlines the strong connection between the three dimensions of sustainability: economic, environmental and social. It further strengthens the idea that in order to solve environmental problems, other interconnected systems must be taken into account.

Malcolm Gladwell examines the little changes that cause big changes in his book The Tipping Point (2000). His prime example is the dramatic drop of crime rate in New York, initiated by the efficient removal of graffiti from subway cars and the police action against fare-beating. Gladwell concludes that there are three common factors behind these dramatic developments: contagious behaviour, little changes that have big effects and the epidemic speed of transformation.

The UK Government commissioned a study on the financial implications of climate change from the ex-director of the World Bank, Nicholas Stern. By putting a price tag on climate change, the Stern Report, published in 2006, broke the issue into the awareness of politicians, business leaders and the public. The main finding of the report was that if no interventions are made, the costs of climate change could reach up to 20% of GNP in the industrialised countries, but by investing in the prevention of and adaptation to the climate change, the costs would stay around 1% of GNP. However, the real costs of climate change will be measured in human lives, not money, as George Monbiot (2006) points out.

This leads to our next question: who are the leaders that initiate and support the changes, and what are the mechanisms that could lead to dramatic results?

Opportunities and Responsibilities of Change: The Systems Intelligence of the Public and Businesses

Jared Diamond describes himself as a "cautious optimist" when affirming that the problems we are facing are not insoluble. Nor do we need new technologies to solve our problems – we only need the political will to apply solutions that are already available. Based on his analysis of the collapsed and surviving societies, Diamond claims that there are two choices we have to make in order to survive. The first is long-term planning, and the second is reconsideration of our core values. Both choices also play an important role in our daily lives. (Diamond 2006)

Both the long term view and the change of values pose challenges. Businesses that aim for short-term profits often operate in a way that damages the environment and hurts people. According to Diamond, the solution is effective legislative regulation combined with an environmentally aware public. Diamond also claims that the public is ultimately responsible for allowing conditions where companies can make profit through non-sustainable activities. Thus, the public can, with

their own actions and choices or through their elected politicians, make damaging business activities either unprofitable or illegal. (Diamond 2006, p. 483–485)

The thought that we, the public, are responsible for saving the planet, is both hopeful and intimidating. The task is enormous, but it can be supported by 6 billion pairs of shoulders. There are numerous ways each of us can contribute to the change. Countless sources, e.g. the web page of Al Gore's film, An Inconvenient Truth (2006), lists many different actions that can be taken, starting from saving energy at home, buying green energy and locally produced food, choosing the right transport and promoting sustainable policies. Our different roles as consumers, parents, citizens, employees, leaders, investors and activists give us many powerful opportunities to work towards change. We could call it the *systems intelligence of the public*.

A similar approach – the *systems intelligence of business* – works through different stakeholder groups that can influence business decisions. Where consumer businesses depend on the buying behaviour of the public, business to business ventures must respond both to the regulations and to the requirements of their business networks. Pressure may be exerted from many different directions. For example, we buy a certain book, magazine or newspaper because of the content, not on environmental grounds. Thus, publishers may not face direct pressure for environmentally sustainable practices from the consumers. This emphasizes the importance of regulation and indirect pressure. A good example is the Greenpeace Book Campaign, which has enlisted bestseller authors, like J.K. Rowling, Ian Rankin, Günther Grass and Isabel Allende, who demand that their books be printed on "ancient forest friendly" paper (Greenpeace International 2007). In the US, the Food and Drug Administration demanded the meat industry to abandon practices which risked the spread of mad cow disease. The meat packers refused for five years, claiming that the rules were too expensive to be followed. When McDonald's, the owner of the "world's biggest shopping cart", made the same demand, the industry yielded. The opportunity – and the responsibility – of the environmental leaders is to identify the points in supply chains and business networks that are most sensitive to pressure (Diamond 2006, p. 484).

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Another opportunity was opened by the publication of the Stern Review (Stern 2006). By presenting the economic advantages of reducing emissions, Stern shows that financial interests often coincide with ecological benefits. Environmental activists and big businesses may, after all, have more common ground than previously assumed. If arguments of opposing sides point in the same direction, difficult decisions can suddenly become easy.

By acting intelligently within our systems, we can identify the windows of opportunity and the pressure points through which changes can be made. We must all take the role of environmental leaders, i.e. "people who are capable of solving environmental problems". When our expanding group of leaders interact within our various systems and networks, through other leaders in businesses, administration, organisations and the scientific community, we can create a strong move toward our common goal (see FIGURE 1). Leaders and their followers form a set of interdependent systems where small interventions reinforce each other and lead to change.

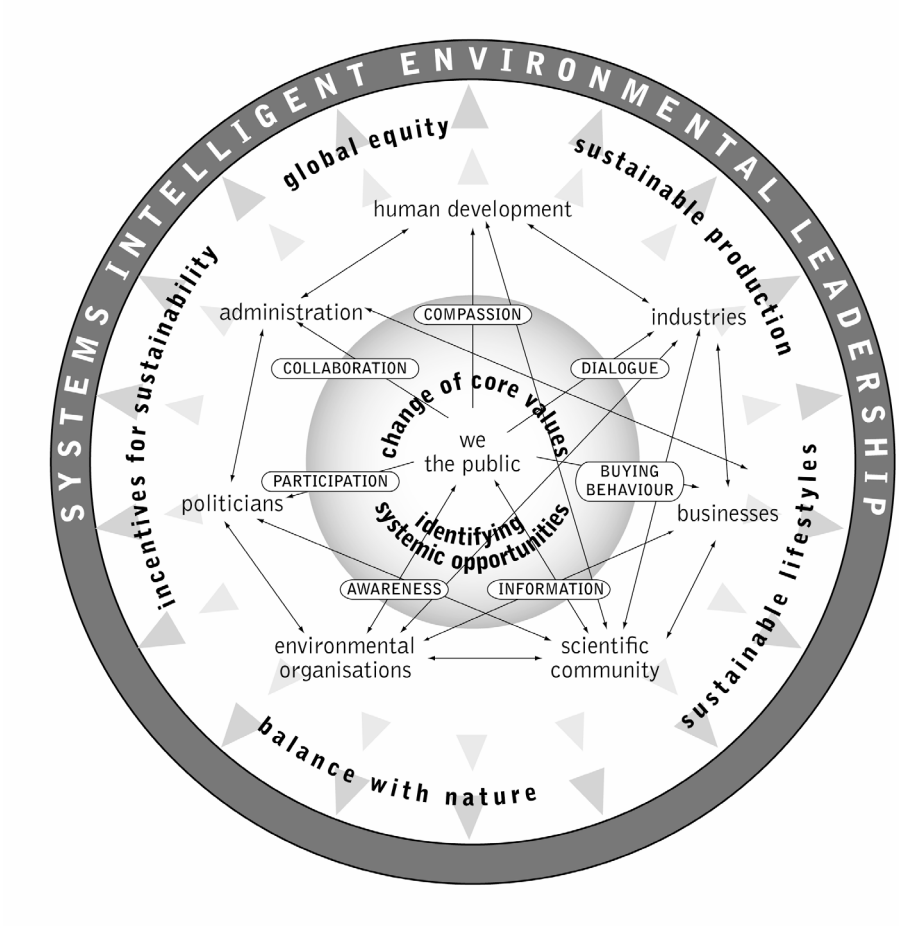

FIGURE 1. The compass of systems intelligence. By changing our values and acting intelligently within our systems and networks, the planet can be saved.

What, then, are the factors contributing to efficient leadership? What are the best ways for us and others to facilitate change?

Leadership, Values and Change

A very good example of positive change is the South African transition from apartheid to democracy. The values, beliefs and examples set by Nelson Mandela and his colleagues laid the foundation for success (see *On the Systems Intelligence of Forgiveness* by Laila Seppä (2007) in this publication). Against all odds, the heroes, released after decades of imprisonment, showed forgiveness, humility and compassion instead of hatred and revenge. The transformation was made possible because of these values and the intrinsic understanding of positive systems impacts.

The Green Belt Movement achieved momentum by challenging the basic belief that the poor cannot improve their situation without external help. The same idea is presented by James MacGregor Burns (2003, p. 215–216). Burns criticises the dichotomy of structure (organisation, company, etc.) and agency (people, actors) and remarks that structures are not giant machines but collections of people, organised in multiple systems. These systems are subject to change, and change can be initiated and controlled through human leadership. Thus, by acknowledging that systems are constructed, man-made, and can be influenced and improved by ourselves, we are empowered to initiate and achieve change.

According to Burns (2003, p. 240), great leaders may initiate change, but it is great people that achieve transformation. Burns points out that the key for the leader is to empower people, to make them adopt new beliefs and ways of thinking, grasp the opportunity in order to realise their ultimate goal, the pursuit of happiness. The result is what really matters, not the leader.

To change established business values is a major challenge. Companies are created to make profit, which is reflected in financial legislation: to intentionally reduce profit is illegal (Diamond 2006, p. 483). A Finnish industry leader compared a company to an ice hockey team, pointing out that only maximal performance is acceptable. Muhammad Yunus talks about Social Business as opposed to Profit-maximising business as an alternative (Yunus 2006). In addition, the Corporate Social Responsibility movement is gaining momentum, leading towards the recognition of a triple bottom line – social and environmental results in addition to the financial ones. Environmental leadership can supply the push towards adopting new business values.

Changing values and beliefs is always difficult. Those who have reached a certain standard of living might feel that they have to downgrade, reduce their living standard, in order to live in a more sustainable way. But changing our focus away from material wealth has a great potential for enriching our life in the social, mental and spiritual areas. Poor people, on the other hand, are more concerned about their daily bread than about environmental matters. Change agents are needed to break these systems of holding back, be it by providing collateral-free loans or by leading us to re-examine our core values. By rethinking our thinking and changing our behaviour, we can all set examples for others – and become environmental leaders.

Profile of an Environmental Leader

The leadership characteristics of systems intelligence, as presented by Hämäläinen and Saarinen (2007) in this publication, match the challenges of environmental leadership:

- *Human-centred characteristics* like the qualities attributed to Abraham Lincoln, "kindness, sensitivity, compassion, honesty, empathy" benefit a leader in building mutual trust and resolving conflicts by bringing opposing parties together.
- A *holistic and systemic approach* helps a leader to find, understand and communicate information on complex issues, taking into account the human, biological and technological dimensions.
- Working *from within* the system is essential for interacting with various stakeholders, using all available resources and utilising the opportunities provided by the dynamics of the system.
- Observing the systemic feedback and the small signals enables the leader to make intelligent decisions and *act in uncertain situations*.
- By promoting high-performance practices, a leader can *generate positive outcome*.

Typical for environmental leadership, according to Gordon and Berry (2006) is that "different people will lead at different times regardless of organizational hierarchy or structure". Thus, leaders may become followers and vice versa. This theme is strongly discussed in the book Transforming Leadership by Burns (2003). According to him, leaders and followers not only interact but also empower each other. In the beginning, leaders empower followers to address their wants and needs and to achieve self-determination and self-development. Followers, in turn, need to empower the leader to continue the path toward the common goal. Who, then, is the leader and who the follower? This dilemma which he calls the Burns Paradox, will disappear if

the leader–follower process is viewed as a system. The roles are not important, which may contradict our traditional view of a leader.

Similarly, we could ask who is the leader in deciding which goods and services are marketed to the people. Is it the industry or the businesses that lead – and decide how ecological or ethical the goods and services are – or are consumers the real leaders by deciding how to use their buying power?

Modesty and humility may be required from a leader who is willing to change places with his/her follower. Jim Collins (2001) presents humility as a key characteristic of truly great leaders. These leaders also demonstrate a strong will to strive for the shared vision of the organisation. They also try to help the next generation of leaders to reach even better results. Purpose and achievement are more important than the ego of the leader.

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Another characteristic of a true leader, closely related to modesty and humility, is to act as you preach – this should definitely apply for environmental leaders. Mark Starik (2004) encourages all environmental leaders and managers to incorporate sustainability into their lives outside the office by utilising the countless opportunities of putting environment-friendly theories into practice. This applies to the personal and household choices, our roles in local and regional communities as well as in other non-work activities.

Military historian John Keegan (2005) analysed the leadership characteristics of four famous generals and summarised his findings as five imperatives of successful generalship. Despite the military context, Keegan's findings have a lot in common with the characteristics of systems intelligent leadership. Keegan's five imperatives can easily be applied to environmental leadership:

- *Imperative of Kinship:* The relationship between the leader and the followers, a "familiar reverence" at best, highlights the human connection in an endeavour toward common goals. This reflects common values and objectives, shared by leaders and followers.
- *Imperative of Prescription:* The skill of communicating vision and objectives is essential in defining the direction of the action – to inform, negotiate and motivate, but also to inquire and listen.
- *Imperative of Sanction:* The power to motivate, empower and reward is a requirement for initiating and sustaining the action. Empowerment is often mutual and the rewards usually immaterial.
- *Imperative of Action:* Knowing and seeing the situation and selecting and performing the optimal action is a complex process. Sometimes, leaders must take action in very uncertain circumstances.
- *Imperative of Example:* Demonstrating one's values is closely connected to the imperatives of kinship and sanction, and may be the first measurement of the leader's worth.

Are these leadership characteristics universal? Can they be applied to any leadership context? And which are the contexts which we could use as models or examples for successful, systems intelligent environmental leadership?

Freedom Leaders

Burns (2003) recalls the failure of the top-down approach of the Indian government in the 1960s and 1970s in introducing family planning to the rural population. Government policies were based on population statistics and western ideas, and failed to take into account the realities and values of the systems of everyday life. In contrast, the ground-up approach of the small Village Health Workers programme achieved dramatic results that even exceeded the goal – the drop of the birth-rate – and spilled over into other areas of activity. The programme, initiated by two Indian doctors, operated in rural villages by involving the villagers and mobilising and training local leaders.

Today, we can read about many similar success stories; cases, where good results have been achieved by ground-up action. Smith and Simington present the case of URDT, Uganda Rural Development and Training Program (Senge et al. 2006). URDT is created and led by Ugandans, and builds on organisational learning principles applied in a village context. The villagers do not receive handouts, but are trained to assess their own situation, build a vision for the village and take action to realise that vision. The action often starts with basic health care and sanitation, and continues to a variety of activities including credits, farming, education and conflict resolution.

Epstein and Kim (2007)[1] report on the successes of the microfinance programme called IMAGE (Intervention with Microfinance for AIDS and Gender Equity) in South Africa. The achievements of the Nobel laureates Wangari Maathai (2004) and Muhammad Yunus (2006) are based on the same principles and practices. In all of these cases, changes are initiated by individuals who have the skills, energy, and determination to provide leadership based on local circumstances and the wants and needs of the people. Burns (2003) calls these kinds of individuals *freedom leaders*, and draws up a plan to employ thousands of them to fight poverty all over the world.

According to Burns, freedom leaders would work towards the values and standards laid out in the Universal Declaration of Human Rights. They would achieve results by changing beliefs and opening new possibilities and opportunities. The partnership of leaders and followers involve listening, mentoring, training, doing together and elevating people to their highest potential. Local leaders would be enlisted to carry on the work, and the collective effort "unites them into a transforming force that may surpass the causal role of the original leadership. In this way people make change and eventually make history." (Burns 2003, p. 240.)

This description of freedom leaders and how they would operate is an excellent model for systems intelligent leadership, and directly applicable to our quest for saving the planet. Freedom leaders are not only needed to fight poverty in developing countries. They could play other important roles in other places, too. They could operate in businesses, environmental organisations, political parties, families; as managers, employees, civil servants, grassroots activists, consumers, engineers, students and teachers. Everyone is needed, all can contribute – we can learn from the third world examples above.

Conclusion

The key ideas of systems intelligence provide renewable energy to environmental leadership. By acting intelligently within and through our systems and networks, cultivating positive outputs and discovering our hidden potential, new visions and solutions to the complex problems can

[1] See also the article of Hämäläinen and Saarinen (2007) in this volume.

emerge. Human sensitivity and values enable us to interact with people who form these systems, to build trust, resolve conflicts and create common visions. A collective push for action on many different fronts can lead to desired snowball effects.

But it is not only environmental leadership that benefits from systems intelligence. Most big problems facing us today share many of the characteristics of environmental problems: complex, confrontational settings, uncertain basis for decision-making, long timeframe, unexpected developments. Systems intelligent leadership can be applied to all human activities.

There are many examples of dramatic changes with small and gradual interventions: India got her independence without a major war. The Berlin wall fell without bloodshed. South Africa managed to transform from apartheid into democracy peacefully. There are also many examples where attempted changes have not taken place despite forceful and sustained efforts using almost unlimited resources. Why?

It seems that successful changes take place – and successful leaders operate – from within the prevailing systems, utilising the values, dynamics and feedback connections of the systems to achieve sometimes gradual, sometimes rapid changes with relatively little effort. The agents behind these successful changes may be charismatic leaders like Nelson Mandela or committed civil servants or activists unknown to the public. In the big failures, on the other hand, the attempt for change is based on exerting pressure and sometimes brute force from outside the system, not taking into account the forces and interconnections within the system. These attempts may often be based on confrontational, dualistic and exclusive approach: good against evil, with us or against us, wise donors helping the ignorant disadvantaged. This strategy is unsuccessful. Even seemingly weak systems have proved to be incredibly resilient against external forces or the best of intentions.

In our mission to save the planet, we cannot afford to fail. Therefore, we must take a co-operative, inclusive and systemic approach. We, as individuals and parts of our respective and interdependent systems, are responsible for the success of this mission. We must start by re-examining our own values, beliefs and attitudes, and by learning from the good examples emerging all over the world. Systems intelligence provides us an excellent framework for the mission.

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Author

The author has worked in the printing and paper industries as well as with development cooperation. He currently works as a lecturer of printing technology at EVTEK Polytechnic in Espoo, Finland. His postgraduate studies at Helsinki University of Technology deal with environmental technology and environmental management in printing and publishing.

pentti.viluksela@hut.fi