

**When the Tide Turns: On Declining Natural Resources, Economic Growth and Welfare (freely translated title of the Swedish book: När vinden vänder: om vikande naturresurser, ekonomisk tillväxt och välfärd)**

**Bengt Bodin, Panta Rei publishers, Sweden, 2014**

While *When the Tide Turns* is easy to read, the low-key language can easily mislead us to believe that we've heard it all before. But if you read it a little more slowly, pondering each sentence, a different picture begins to emerge. The author's profound reflections and experienced judgments of our (Swedish) possibilities for a sustainable life in future show something completely different than the "green" economy that many politicians so glibly and frequently speak of.

**Agronomist and SLU (Swedish Agricultural University, Uppsala) scientist Bengt Bodin's** starting point is the bio-productive land (land on which things grow or "green" land including forests, grasslands, wetlands, etc.), which every person on earth has available, on average, for their livelihood. It is not large, only 1.1 hectares or 100 meters by 110 meters, a little more than a soccer field or about 2.6 acres. On this all our food is grown, energy collected, carbon dioxide absorbed, our water purified, and to top it off, all our waste must be handled. Nature's numerous other animals and plants also need to find a healthy living space here.

**Beginning with our food**, Bodin notes that the part of our parcel of land suitable for cultivation is already utilized maximally. On it we can grow enough for our basic nutritional needs, albeit not as much meat as today. But there is no land left over for growing corn or rapeseed for vehicle fuels, not in Sweden nor in the rest of the world. Bodin notes that this land area can provide everyone opportunity for a decent life, by which he means taking care of basic needs, but little more. Anything beyond basic needs means that you've taken someone else's land into use, somewhere in the world. Bengt Bodin therefore calls us in the rich part of the world "welfare recipients" and claims that those who consume the most are the biggest welfare takers.

**Our food today is heavily dependent on oil**, all the way from farm to table to waste disposal in sewage treatment plants and landfills. What happens when oil becomes more expensive, or severely rationed in a crisis? Without chemical fertilizers from oil, it becomes necessary to completely switch over to organic farming. This decreases yields to about half. Yields can still cover our nutritional needs, but the "silver linings" such as meat, and strawberries in January, will be strictly limited.

Since joining the EU, we have no stockpiled food. If there is a crisis, with rationed transport, we're on our own. We can then also reckon with increased immigration from overcrowded, land-poor parts of the European Union to sparsely populated Sweden. During difficult times, such as in Greece today, people move back to the countryside where they can get food. Bodin sees such a ruralization likely in Sweden, too.

**Renewable energy** is a concept that Bengt Bodin goes hard against. On the one hand he says that all energy is indestructible and can only change form, for example from biomass to electricity, with a loss of quality in each conversion. Practically speaking, all the energy we can harness comes from the sun directly or through plants and wind and water movements. The energy from plants is already fully subscribed on our little 110 meter parcel of "green" earth. That leaves solar, wind and any additional forms of energy—as long as they don't require arable land, poison the environment or cost more than it's worth. Bengt Bodin scrutinizes the various forms of "renewable" energy and finds that all

contribute to modern society's mountain of waste: almost everything produced with the help of our energy (wherever it comes from) becomes waste that nature can not accommodate and utilize to build new resources again. The waste accumulates over time.

**Waste is thus the limiting factor for industrial society** and for each of its component parts, including the energy industry. The energy industry's own waste is well known: carbon dioxide from fossil fuels, hazardous waste from nuclear plants, coal ash, etc. Fresh biomass is no exception, says Bodin, since combustion here, too, gives off carbon dioxide and leaves ash, which is often contaminated and must go to a landfill. Water treatment plants, too, are ultimately useless as they create contaminated sludge while letting through heavy metals, medications, drugs, endocrine disruptors and other harmful substances. The entire system, including society's widespread use of chemicals, must change before the sludge is safe and can be used to recycle the nutrients in our urine and feces back to agricultural land.

Creating closed loops in industrial production would be a partial solution, according to the author, were it not the case that most people in the world want material growth, which eats up any gains. Many of the world's poor look to the lifestyle in the industrialized countries as their model, and world population is growing. "Circular economy" and "green economy" are thus no panaceas as long as we continue with our current lifestyle and material growth.

What is needed, instead, is reduced consumption and a phase-out of all hazardous substances. This requires EU legislation and massive public education campaigns that emphasize personal responsibility and fully taking in that we cannot continue to trash our little patch of land. Furthermore, we must learn that our current way of life is based on contributions from the past (fossil energy) and from future generations (salinated, dustbowl farmlands, reduced forests, depleted oceans, extinct species, etc.). We live far above what nature gives us each year.

**That each year there are more of us** to share the pie is also well known: population size is part of the calculation of how much bioproductive land each individual has at his or her disposal. A European's slice of land is only 0.7 hectares (about 1.9 acres), less than the world average of 1.1 hectares. Europeans thus maintain their standard of living only through imports, ie, through resource contributions from other parts of the world. Increased family planning is clearly thus beneficial to all, even to Europeans, as is more equally sharing the limited natural resources available. Sweden is sparsely populated and can expect increased immigration in an era of global resource shortage.

**Future growth opportunities** are primarily limited by nature's annual growth and its ability to accommodate human waste. Bengt Bodin calls for further research to investigate the possibilities and clarify the framework within which humanity must operate. He places full responsibility on politicians to educate themselves in this field, commission research work and follow its recommendations.

More research is certainly worthwhile, but Bengt Bodin's *When the Tide Turns* provides us an excellent and readable current overview of sustainability from a systems perspective. Among many conclusions that might be drawn for policy are the following:

- Never again build on arable land! (We are going to need it.)
- Preparing for the future means planning for significantly reduced transportation needs. Rather than expand urban centers, it is better to invest in sustainable renovation of existing dwellings in rural areas where food and jobs will be available when high-priced oil makes labor-intensive, organic agriculture necessary (as well as profitable).

- Forget major road and air infrastructure projects as well as subsidies to high-mileage or electric cars (we will have neither cheap nor clean energy to support these). High-speed trains likewise.
- A sustainable society is a low-energy society. Use tax reform with taxes on energy and resources to reduce energy consumption and hazardous waste. This will simultaneously increase health. (Today, many mineral resources are subsidized!)
- For better health, survival and overall life prospects, in all countries of the world, opt for family planning and a steadily declining population. The fewer the people, the less the overconsumption, the less the waste, and the bigger the parcel of "green" earth available to sustain each person and more wildlife.

Just as today's high-energy society is based on political decisions of the 50's, so too will the sustainable society of 2050 be based on the long-term decisions we now take. If we take Bengt Bodin's analysis seriously and plan accordingly, we can expect a "dignified" life with food and health security for all, and good human relationships, but not the "silver linings" of automobiles, aviation and other luxuries that we are accustomed to. We and our children will, however, be much better prepared for the future of declining natural resources that is already underway.

**Archie Duncanson, Stockholm, april 2014**

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## **Quotes from "When the Tide Turns"**

(freely translated by Archie Duncanson. Page numbers refer to the Swedish 2014 edition):

The loading on the planetary ecosystem is proportional to the number of consumers and ... consumption per consumer. p 29

If more plant material is broken down than what plants are able to recreate continuously, the ecological system to which we are adapted changes unfavorably for us. p 41

Particularly alarming is that pollutants originating in food from soil fertilized with sewage sludge has now been identified in breast milk, umbilical cord blood and in infant's blood. p 67

With a shortage of fossil energy inputs, national food production will drop significantly. p 55  
...The country needs a new self-sufficiency program. p 56

Our current lifestyle cannot be maintained using so-called "renewable" energies. p 90

[ We must learn] ... how the limited resource base, which the natural system comprises, can be managed so as not to be consumed. p 93

We live off of contributions from our under-nourished contemporaries and from a posterity whose natural resources we overdraw. p 114

The vast majority of us are on welfare and those who consume the most are the biggest takers. In this context, welfare for the sick and the unemployed is of relatively little consequence. p 94

People's sense of security for the basic necessities of life is obviously crucial for society to function. p 112 The ability to maintain order in the nation under conditions where food staples are lacking, is highly improbable. p 26

The future can be both enjoyable and life-affirming, even if also very different. The necessities of life are not yet at risk. p 118

Food security, housing security, as well as healthcare and care for the aged, are political issues... and issues of high priority for the majority of people. p 119

A new financial system must aim at limiting the circulation of energy and matter to what lies within in the boundaries of nature's long-term sustainability...while also countering "land grabbing". p 111

The planet with its natural systems cannot be seen as human property to manage at its discretion, but as a unique existence whose current functions man...is totally dependent upon through his evolution...It is instead a self-organizing system...[and] mankind...must subordinate itself to the system's ability to regenerate. p 121

**Short summary:**

*När vinden vänder* (*When the Tide Turns*) gives a clear picture of how dependent we are on what we call "nature" – and not the other way around. With reference to the small parcel of land that every person on earth has, on average, for his sustenance, Swedish agronomist and research scientist Bengt Bodin explains the need to redirect policy from material growth to long term sustainability, for our own, as well as other species', health and survival. Thoughtful, in-depth, reflective – one gains a new respect for the limits of the planetary ecosystem and for humanity's blind takeover. An excellent and readable account of sustainability from the systems perspective, for decision-makers and politicians, as well as for the educated general public. Archie Duncanson, author of [Ecology Begins at Home](#) and, in Swedish, [Hushålla med jordens resurser](#) (Conserve the Earth's Resources).