

## On the way towards a degrowth society: a review of transformation scenarios and desirable visions of the future

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### Abstract

*A society involuntarily confronted with de-growth (because it has reached the limits of economic growth, probably due to the consequences of Peak Oil and/or climate change) will mainly regard this phenomenon as a severe crisis. Rising unemployment, rising poverty levels, diminishing supplies of basic goods – especially for the poorer parts of society – and rising social tensions may be some of the symptoms.*

*Thus, the question arises if and how a smoother transition towards a degrowth society might be shaped and managed. This transition should have the following features:*

- *it should be compatible with a reduction of resource throughput to stay within ecological limits*
- *it should allow that the shrinking economic wealth is distributed more equally (in such a way that grinding poverty is avoided)*
- *it should mitigate the worst symptoms of crisis (as mentioned above)*
- *it should connect the necessary reduction of resource use with positive images and values.*

*In this article we undertake a systematic review of approaches, policies, strategies and future visions that are relevant with respect to the transformation of society into one that takes reaching ecological goals seriously.*

*The here discussed approaches cover a broad bandwidth: Starting from more conventional approaches of reforming the market economy (like Ecological Tax Reform), moving to more ambitious reforms (like quota systems in the form of TEQs, i.e. Tradable Energy Quotas and similar ones), moving further to approaches including profound transformations which involve deeper structural changes in society.*

*The approaches covered will be assessed with respect to several criteria: Are they compatible with a de-growth strategy at all? Do they fulfill the necessary features of a transition strategy (as mentioned above)? What is the role of markets, the state and other stakeholders? Are there nuclei of the vision already in place or happening? Were could a “degrowth movement” find relevant models to refer to? Is the approach or vision more oriented towards a desirable final state or more towards the necessary transition?*

*After assessing the approaches according to the framework shortly outlined above, final remarks, conclusions and recommendations will be presented.*

**Keywords:** degrowth, transition strategies, societal change, future visions, peak oil, resilience

### 1. Introduction

What happens to societies confronted with economic degrowth (i.e. with shrinking economic activity as being measured by gross domestic product)?

We may infer our predictions from past examples of societies involuntarily confronted with degrowth, like Eastern Europe and Russia in the 1990-ies, Argentina around 2000, Cuba and North Korea after 1990. These experiences show that rising poverty levels, rising unemployment, diminishing supplies of basic goods – especially for the poorer parts of society – and rising social tensions leading in the worst case to a civil war may be some of the symptoms of a degrowth phase.

The symptoms of crisis caused by the shrinking of the formal monetary economy are to some extent levelled off by growing importance of the “informal economy” and of subsistence structures. As well, the potential for implementing social experiments, e.g. broad introduction of new local currencies, like the “Credito” in Argentina, grows (though this particular experiment failed). Different societies also show a different potential of coping with the unwelcome effects of degrowth in a more human or a more inhuman way: take Cuba on the one side as a more positive example (despite several problems) and North Korea on the other side as a clearly negative example.

It is likely that the diminishing supplies of fossil energy resources (having become popular under the notion of “Peak Oil”) turn out to be a historical turning point: Economic degrowth may spill over from the peripheries of the global economy and become a mainstream phenomenon.

On the other hand, degrowth may not only be regarded as a cause of crisis, but as desirable. This idea emerges with the ecological movement (e.g. the early Green parties in Europe were rather critical towards economic growth) and has gained momentum in recent years in the “decroissance”-movement, mainly in France.

Mainstream policy-makers still cling strongly to economic growth. Degrowth (either voluntary or involuntary) is still a taboo.

### 2. About transition strategies

#### Requirements of transition strategies

If we accept the premise that economic degrowth will be a common phenomenon in the not too distant future and that degrowth is also desirable (mainly due to ecological reasons) the question arises – in the light of experiences with negative consequences of degrowth in the past – if and how a smoother transition towards a degrowth society could be shaped and managed.

This transition should have the following features:

- It should allow to be kept within ecological limits by reduction of resource throughput and emissions (e.g. drastic reductions of greenhouse gas emissions).
- It should allow that the shrinking economic wealth is distributed more equally, in such a way that grinding poverty is avoided. Leaving the distribution of goods merely to markets in a period when the economy shrinks, incomes fall and prices of basic goods rise, means that more and more people have growing difficulties to obtain a sufficient supply of basic necessities (take the recent food price crisis as an example).
- It should mitigate the worst symptoms of crisis (as mentioned above) that may arise due to economic degrowth. A by and large peaceful transition by mitigating social tensions may be regarded as an especially desirable goal.
- It should connect the necessary reduction of resource use with positive images and values. Raising the population's acceptance for strategies and measures that are regarded as unconventional and/or inconvenient (and initially unpopular) is crucial for any transition strategy.

#### **Criteria to assess transition strategies and visionary models of society**

Transition strategies and visionary models of society can be assessed with respect to several criteria:

- Are they compatible with a degrowth strategy at all?
- Do they fulfill the necessary features of a transition strategy (as mentioned above)?
- What is the role of markets, the state and other stakeholders?
- Are there nuclei of the vision already in place or happening?
- Where could a "degrowth movement" find relevant models to refer to?
- Is the approach or vision more oriented towards a desirable final state or more towards the necessary transition?

In the following we will discuss and classify several approaches, taking into account the criteria above.

### **3. How to degrow – a discussion of approaches, strategies and future visions**

In the nineteen-eighties and -nineties, issues of social movements diffused in official politics under the headline of sustainability. However, during this decade ecological and social problems were intensified by the neoliberal turn towards privatization and globalization. Partly as a result of internal developments after the collapse of the traditional Left, partly in the frame of the resistance to globalization many new approaches and future visions were developed within progressive movements. The main questions tackled

were: how can ecological and social problems be solved, what is a good life, how can it be reached?

Degrowth challenges us in many respects without any historical precedence. Nevertheless it will be necessary to draw on existing theories and ideas in the first step and to use wisely the intellectual wealth social movements have created over many decades in order to react effectively.

Table 1 thus gives an overview of existing approaches to social change that might be useful to manage degrowth. They are either implemented (e.g. emission trading), currently developed (e.g. solidarity economy) or widely discussed (e.g. basic income). Each approach is described by a set of criteria. Approaches and criteria were clustered by use of multivariate statistic (see appendix). Approaches that favor some sort of socialisation of the means of production and partly promote degrowth are separated from those that favor market mechanisms and promote growth of the monetary economy.

See table 1 in Annex.

Figure 1 visualizes how different approaches relate to each other in terms of similarity. The same data set as in table 1 was used. Approaches were grouped according to table 1 (see table 3). Mainstream approaches favoring market mechanisms are rather homogeneous, whereas approaches favoring social control of production show considerable variation. The main difference in this group concerns the question (1) whether or not the state should take a leading role in social change and (2) if basic capitalist social forms such as wage labour or money are being questioned or not.

Figure 2 roughly indicates discursive weights of the approaches analyzed by counting entries of catchwords characteristic for each approach in the World Wide Web. Global Keynesianism, Free Money (Local Currencies) and New Work outweigh all other approaches. Solidarity Economy and Emission Trading are also widely discussed.

See figure 1 and 2 in Annex

Hence the big picture consists of three kinds of discourses: (1) reforming the market economy, (2) redefining socialism, and (3) rebuilding society from the bottom up. Approaches representing each of these will be discussed in the following.

#### **Reforming the market economy**

The basic premise of market-based reform proposals is that it is possible to reach ecological (and social) goals by integrating certain regulatory frameworks into the existing market economy. The most prominent reform proposals in this respect are the Ecological Tax Reform and Emissions (resp. Certificate) Trading. Whereas the first tries to influence directly the *pricing* of goods and services by making undesirable, ecologically harmful items more expensive and desirable ones less expensive, the latter tries to regulate the *amount* of certain items, mostly emissions, in particular greenhouse gas emissions. In the case of emission trading a cap is set and normally reduced from period to period, emission entitlements (certificates) are allocated by various methods and trading of emission entitlements is allowed. Depending on the scarcity of entitlements the price of entitlements varies influencing indirectly the prices of desirable and undesirable goods.

In principle, certificate trading schemes are more suitable to guarantee attaining certain goals (like emission limits), because they directly regulate the amount of a certain item. The effects of an ecological tax reform are less clear because the reactions of consumers on rising prices can only be estimated roughly in advance. But currently existing certificate trading schemes, like the EU Emissions Trading Scheme, are criticised for several reasons, as e.g. outlined in FEASTA (2006).

Both, Ecological Tax Reforms and Certificate Trading Schemes, are already implemented to a certain extent but were not able yet to reverse the trends of growing resource throughput and emissions.

Several more ambitious proposals have therefore been made, claiming to be more effective regarding ecological and social goals, like "Tradable Energy Quotas" (Fleming 2007) or "Cap and Share" (FEASTA 2008). Common features of these proposals are that every adult citizen (nationally or globally) would receive the same amount of carbon emission entitlements and all carbon emissions from fossil fuels (either nationally or globally) would be covered.

All market-based reform proposals aim at *material degrowth* in the sense of reducing resource use and/or emissions, although they are not necessarily successful. But how do they position themselves regarding *economic growth* and *degrowth*?

Three positions can be identified in this respect:

1) the "*win-win-principle*": it is possible to significantly reduce material throughput and/or emissions while the (monetary) economy keeps on growing.

The win-win-principle is based on the assumptions that

- a) steadily on-going improvements in resource efficiency are possible and these efficiency improvements grow faster than the economy and/or
- b) the transition towards renewable energy allows a constant and even growing amount of energy services (and thus economic value).

One may be sceptical about the validity of these assumptions, speaking with the prominent ecological economist Herman Daly (Daly, 2007):

„Some (Amory Lovins) think GNP can grow tenfold or more with a constant throughput - that is, a tenfold increase in resource efficiency. I tend to doubt it.“

2) the question is more or less ignored.

3) the possibility of a shrinking economy is recognized but either seen as rather non-dramatic or manageable.

Representing the third position is David Fleming, inventor and promotor of "Tradable Energy Quotas" (TEQs): "No problem: the main reason why we need economic growth is to maintain full employment [...]. If the climate action maintained near-full employment - and it would certainly be a job-provider - the critical task of sustaining a stable economy would be achieved" (Fleming 2007, p. 37).

FEASTA (2008, p. 26) argues that economic growth would take a different form. "Energy-intensive activities will decline, labour-intensive ones will expand. The overall effect on total world income is impossible to calculate but

incomes in the energy-intensive parts of the world can be expected to decline in relative terms." But this effect would be, as FEASTA points out, an effect of any method of limiting fossil fuel use.

### **Eco-Socialism sensu Sarkar – a redefinition of socialism**

Following an analysis that stresses the limitations of technological potentials, the basic premise of Eco-Socialism in the sense of Saral Sarkar is that the necessary reductions of resource throughput and emissions go hand in hand with a shrinking economy. Within capitalism the reduction of the size of the economy (= degrowth) would lead to chaos and cause a severe economic downturn: "A shrinking capitalist economy would mean a catastrophe for the whole society, a never-ending great depression. [...]. Therefore, the state must take up the task of organizing the retreat. It must be a planned retreat, otherwise there will be terrible chaos and calamity" (Sarkar/Kern, 2008, p. 27f.).

Furthermore, the necessary reduction of individual consumption will be more acceptable within a more „equal“ society with little differences in income.

Basic principles of Eco-Socialism (according to Sarkar) are:

- (1) organizing the transition period (as a planned contraction) by the state
- (2) economic planning
- (3) socialisation of big capital (owned by the state or socially controlled institutions); small enterprises may be run by individuals, families or cooperatives.
- (4) participation of the people through decentralized, small economic and political regions (after the transition phase)
- (5) use of appropriate technology: labour-intensive, resource-saving technologies are preferred

Eco-Socialism would be compatible with a degrowth society as this issue is one of the main reasons for transition. During the transition phase first the state and then different institutions on a local, regional or even worldwide level will play a considerable role. Herein lies one possible source of contradiction: although strong participation of citizens is intended, (local or national) authorities should be rather powerful at the same time.

### **Building a new society from the „bottom up“ – beyond market reforms and state interventions**

A third group of transition approaches is characterized by a critical consideration of both the market and the state. Economic growth is seen as an unavoidable dynamic of capitalist markets. The state also promotes economic growth being interested in increasing tax revenues and a stable political order.

Following this argument, market and state are rather part of the problem than of the solution. Money is seen as the basic communication medium of capitalist economies and is heavily criticized suggesting that it makes an escape from the growth addiction impossible.

Accordingly, the necessary change would originate from initiatives that create social relationships and relations of production beyond the market, controlled by direct communication and directly oriented towards the satisfaction of needs. The subsidiary organization of

production and decision making is favored, along with a great deal of local autonomy. Two well elaborated visions that belong to this approach are „Subcoma“ (P.M., 2000) and „The Simpler Way“ (Trainer, 2007).

#### “Subcoma”

A society beyond market and state would have to be gradually created. In “Subcoma”, the growth of an alternative society starts on the one hand with local initiatives and projects that enrich already existing neighborhoods with collective elements, such as the joint use of tools, common kitchens, or networks of social self-help.

On the other hand, it starts with the creation of an increasing number of experimental communities, where new ways of living could be tested and illustrated by example. The public authorities should not organize these joint activities, but foster their development facilitated by an appropriate legal framework. This could include the creation of funds that strengthen experimental communities or the allocation of vacant buildings.

These initiatives, projects and experimental communities would successively link themselves to each other, in order to build nested organizational levels. With expanding collaboration an increasing number of tasks and products could be manufactured and organized outside the monetized economy. Since this domain would be directly controlled by the people instead of indirect, disembedded monetary relations, no constraint to increase output would exist.

At the final stage of this transition process, six types of social organisations on different scales would organise and satisfy all human needs according to the principle of subsidiary production. On the most basic organizational level, the „Life Maintenance Organisation (LMO)“ would comprise about 500 persons, being able to produce about 60% of all goods and services demanded by autonomous self-organization. Several of these LMOs would constitute a communal area (CA), encompassing about 15.000 persons. On this scale, according to P.M., about 80% of self-sufficiency would be possible, as well as a grass-root democratic planning. Further organizational levels, each constituted by an association of several of the lower level organizations, would be the agro-urban region (150.000 to 12 million people), the autonomous territory (10 to 20 million people), the subcontinental network (0,5 to 1 billion people) and the planetary organisation (all human beings).

#### “The Simpler Way”

Trainer’s ideas are similar to those of P.M. in many ways. The basic economic unit according to Trainer would be the suburb or town and most of the things that are needed would be produced by this local economy. Only such production that is impossible on this level of organization would be organized in concentric circles around this basic unit.

Similar to P.M., the transition could start with working groups that develop neighborhoods („Community Development Collectives“). Their task would be to mobilize unused potentials that enable the community to satisfy parts of their needs autonomously, for example by community gardens and collaborative workshops. Also,

voluntary activities could be organized locally and help to maintain infrastructures.

In the beginning of the transition process, part of the production would be still monetarized. However, all production takes place under close participatory social control or in cooperatives instead of privately owned companies. Contrary to socialist conceptions, the state would not function as a centralized planning organization, but instead would be substituted by a cascade of nested economies that are directly controlled in their local environment.

## 4. Degrowth in practice

Apart from the mainstream reform proposals the approaches discussed in the previous chapter were mainly visionary. Consequently the question arises which concrete models and examples actually exist a degrowth movement could refer to. In the following we shortly present two examples for bottom-up initiatives (transition initiatives, urban gardens) and outline the case of a country confronted with economic degrowth (Argentina).

### Transition initiatives

Transition initiatives (like transition towns / cities / villages / islands) have committed themselves to proactively face the twin challenges of diminishing oil and gas supplies and climate change in a participative manner involving the local community.

For example the two-fold mission of the transition town Totnes is:

1. To explore and then follow pathways of practical actions that will reduce our carbon emissions and dependence on fossil fuels.
2. To build the town’s resilience, that is, its ability to withstand shocks from the outside, through being more self-reliant in areas such as food, energy, health care, jobs and economics (<http://totnes.transitionnetwork.org>).

Transition initiatives have in common that they

- are very process-oriented (sharing practical tools for communication etc.)
- try to create and promote positive visions for a low-energy, more localised future
- stress permaculture design principles
- try to involve the whole community.

They form a fast growing network, mainly situated in the UK, but also in Ireland, Australia, New Zealand and the USA.

One core activity of a transition initiative is the creation of an “Energy Descent Action Plan” (EDAP). An EDAP consists of a collective vision concerning how the region in question could and should look like in 2020 or 2030 (taking into account especially the diminishing availability of oil and gas) contrasted by a description of the status quo. Creating the vision is followed by an elaboration of pathways which show how to get from here to there (Hopkins, 2005).

Richard Heinberg proposes to complement Energy Descent Action Plans with “Community Resilience Plans” that have a more explicit focus on disaster management. In a recent publication Heinberg (2008) outlines 10 steps of how to develop such plans. David Fleming criticises that transition initiatives at present are far away from fulfilling their ambitious goals although he appreciates the pioneering work done there. He argues that the transition needs to be backed by setting up a Tradable Energy Quotas (TEQs) scheme (Fleming, 2008).

### **Urban gardens in Detroit**

Urban gardening has become a widespread practice worldwide in order to transform urban environments, restore food sovereignty and enhance quality of life. Often cited are the urban gardens in Cuba, which enabled the population to overcome the severe shortenings of food and oil imports after the collapse of the Soviet Union.

Less known is the example of the urban gardening movement in Detroit, USA (Boggs, 2006, Howell, 2006, Exner and Vellay, 2006). The Detroit region was once famous for its car industry. Due to outsourcing, rationalization and deindustrialization, the car industry was affected by a severe crisis in the eighties. Unemployment rose, while social programs were reduced.

In this situation, social movements in Detroit developed a common vision of urban agriculture. The main idea was to rebuild socially as well as economically those parts of the city that were abandoned. Urban gardening became community gardening in a double sense: to produce healthy food cooperatively reorganizes social relationships that are damaged by capitalism.

The urban agriculture movement in Detroit emphasizes self-reliance, cooperation, unconditional support for the poor and networking from the academic to the social activist and cultural scene. Poetry workshops stimulate creativity and develop local discourse. Mural painting revitalizes public space and social relationships. These are essential for further progress towards cooperative production networks.

### **„Crisis management“ in Argentina**

In December 2001 Argentina – once a country with a standard of living comparable to Europe – experienced a nearly complete collapse of the capitalist economy. Already before the collapse out of 37 million people 14 million were poor, 5 million of them absolutely. More than a third of the workforce was unemployed. On the 19th December 2001, massive protests of the unemployed and the middle-class led to the resignation of the government. In the following weeks, a nationwide exchange network, the Red Global de Trueques, was established starting from small circles that had been grown steadily since the end of the nineties. On several occasions, workers took over capitalist enterprises left by the owners. In many parts of the cities peoples assemblies (asambleas) emerged. The whole social movement was propelled forward by the piqueteros, organizations of the unemployed, that gathered strength in the course of the economic crisis (Brand, 2003, Habermann, 2004, Boris and Tittor, 2006).

Results of these movements are ambiguous. On the one hand, social movements were not successful in organizing

life-supporting services such as food production and health care on the scale necessary. The huge exchange networks borne out of emergency were not able to provide enough food for the impoverished masses. In 2002 the Red Global de Trueques broke down to a great extent. Similarly, social movements did not succeed in formulating an alternative to traditional politics that rely on economic growth. Seen from this perspective, the social movements after 2001 were strong but ephemeral.

As for 2008, the economic situation has improved and most of the movements were absorbed by capitalist everyday life. The economic collapse triggered self-organization processes that were unexpected. These both helped to survive and opened space for positive visions and collective debates. However, social change was limited because movements failed to build economic structures and social networks that were self-reliant.

## **5. Concluding theses, proposals and open questions**

Due to the consequences of peaking fossil fuel supplies and climate change, “the economy” as we know it will come to an end anyway. A smooth transition towards a degrowth society might be possible. However, the involuntary confrontation with degrowth is more likely. Since a smooth transition is unlikely, especially on a global scale, it is important to start now to strengthen resilience of communities and societies, at least at the local level (see ch. 4.1).

Thus we propose for action first of all to think about what is NOT to be done anymore. This means in particular cancelling decisions that do not fit in a future of post-peak oil and climate change. The construction of fossil fuel dependent infrastructure like roads, suburban development etc. must be stopped immediately. As quick as possible, preparation for the energy descent should be started, for instance in the form of “Energy Descent Action Plans” and “Community Resilience Plans” (ch. 4.1). This must be accompanied by creating space and allocating resources for social experiments from the „bottom up“. Resources freed by cancelling decisions on infrastructure development must be invested into transition management.

Open questions remain, since the course of events is not predetermined but will be the result of social actions taken. Globalised market relations are likely to shrink dramatically. However, the question what will or should remain of the capitalist market economy cannot be answered in advance. Especially the task to re-organize production and distribution on a local level can only be solved by promoting social innovations on a broad-scale.

Localized markets might probably be under some sort of social control. But social movements and struggles will finally decide to what extent local markets will remain and if they will also be capitalist markets, i.e. including wage labour. How inter-regional production networks and material as well as energy flows will be organized remains unclear.

The approaches reviewed in this paper indicate directions social movements should explore, but outcomes of struggles and results of social learning cannot be anticipated.

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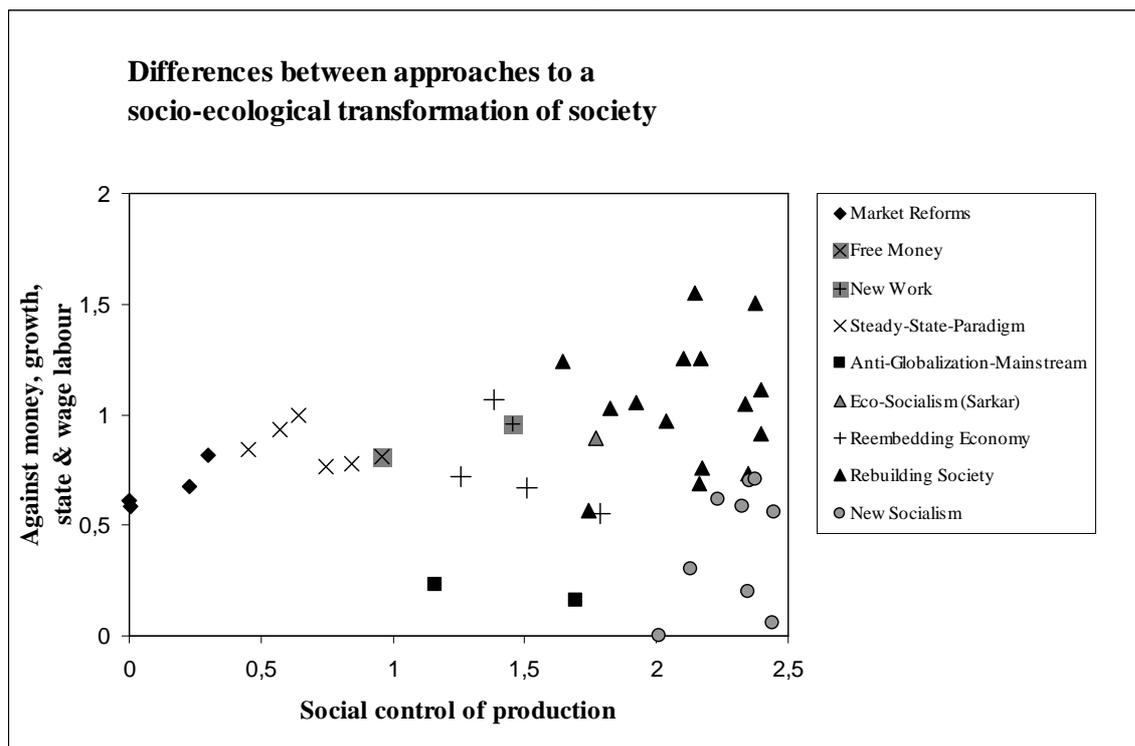
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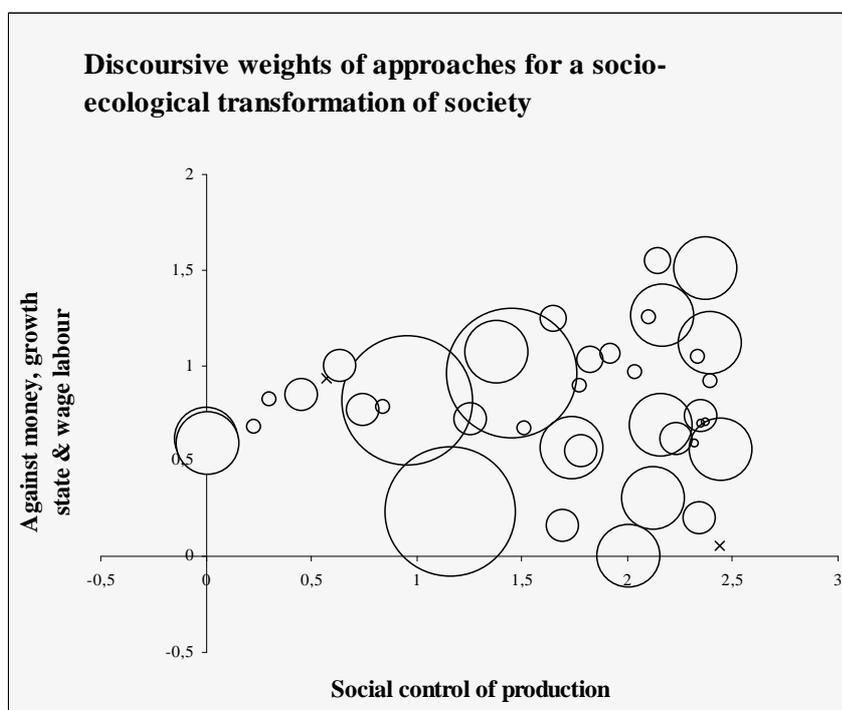
## Tables

see annex

Annex



**Figure 1:** displays the result of a detrended correspondance analysis performed by the program CANOCO (Ter Braak and Šmilauer 1998). Default settings were used. The closer two data points are, the higher is the similarity of the corresponding approaches. The first two axis of variance are interpreted as a gradient of social control of production and the degree of rejection of capitalist social forms, i.e. of money, state, wage labour respectively. Cluster of approaches correspond to the TWINSPAN-result (table 1). See table 3 for details.



**Figure 2:** Data for the estimation of discursive weight are given in table 3. Circle radius corresponds to the number of entries of catchwords indicating a given approach in the WWW.  $x = < 100$  entries, circle radius 4 = 100-1.000 entries, 8 = 1.000-10.000 entries, 16 = 10.000-100.000 entries, 32 = 100.000-1.000.000 entries, 64 = > 1.000.000 entries.



<b>Approach</b>	<b>Author, Sources</b>	<b>References for table 1</b>
1 Socialism	Christian Zeller	Zeller (2004)
2 New Socialism	Paul Cockshot	Cockshot (2007)
3 Radical Reformism	Joachim Hirsch, Linksnetz a.o.	Hirsch (2005), <a href="http://www.links-netz.de">www.links-netz.de</a>
4 Post-Capitalism	Immanuel Wallerstein	Wallerstein (2002, 2004)
5 Operaism	Karl-Heinz Roth	Roth (2005)
6 User-Oriented Supply-Economy	Alfred Fresin	Fresin (2005)
7 Free Doing	John Holloway	Holloway (2002)
8 Practical Socialism	Hans-Jürgen-Krahl-Institute	Hans-Jürgen-Krahl-Institut (ed., 2008)
9 Integrated Society	Kai Ehlers	Ehlers (2006)
10 Libertarian Municipalism	Chaia Heller, Murray Bookchin	Heller (2007)
11 Free Cooperation	Christoph Spehr	Spehr (2007)
12 Caring Labour	Nancy Folbre	Folbre (2007)
13 Peer Economy	Christian Siefkes	Siefkes (2007)
14 Gift Economy	Genevieve Vaughan	Vaughan (2002)
15 Revolutionary Economy	Willem Hoogendijk	Hoogendijk (1991)
16 Subcoma	P.M.	P.M. (2000, 2007)
17 Subsistence Economy	The "Bielefelderinnen"	Mies (2001), Werlhof et al. (2003)
18 Anti-Economy	Group "Krisis"	Kurz (1992), Trenkle (1996)
19 Global Villages	Franz Nahrada	<a href="http://www.oekonux.de/texte/globdorf.html">www.oekonux.de/texte/globdorf.html</a>
20 The simpler way	Ted Trainer	<a href="http://ssis.arts.unsw.edu.au/tsw/">http://ssis.arts.unsw.edu.au/tsw/</a>
21 Dual Economy	André Gorz	Gorz (2000)
22 Solidarity Economy	various	e. g. Altvater & Sekler (ed., 2006)
23 Local Exchange Trading Systems	various	e.g. <a href="http://www.tauschkreise.at">www.tauschkreise.at</a> , <a href="http://www.lets-linkup.com">www.lets-linkup.com</a>
24 Participatory Economics	Michael Albert	Albert (2007)
25 Reembedded Economy	Elmar Altvater	Altvater & Mahnkopf (1999), Altvater (2005)
26 Localism	Rob Hopkins, Colin Hines a.o.	Hopkins (2006), <a href="http://www.opentheory.org/attac-awwo/text.phtml">www.opentheory.org/attac-awwo/text.phtml</a>
27 De-Globalization	Eckhard Stratmann-Mertens	Stratmann-Mertens (2004)
28 Revolutionary Reforms	Mohssen Massarrat	Massarrat (2006)
29 Eco-Socialism	Saral Sarkar	Sarkar Sarkar (2001)
30 Global Keynesianism	Attac	<a href="http://www.attac.at">www.attac.at</a>
31 Market Socialism	Hans-Georg Conert	Conert (2002)
32 Cap and Share	Richard Douthwaite	<a href="http://www.capandshare.org">www.capandshare.org</a>
33 Oil Depletion Protocol	Richard Heinberg	Heinberg (2006)
34 Personal Carbon Trading	David Fleming	<a href="http://www.teqs.net">www.teqs.net</a>
35 Sun-Economy	Hans-Peter Aubauer	<a href="http://homepage.univie.ac.at/hans.peter.aubauer">http://homepage.univie.ac.at/hans.peter.aubauer</a>
36 Steady-State-Economy	Herman Daly	Daly (1999)
37 Emissions Trading	EU-Policy	
38 Ecological Tax Reform	Policy in many EU-countries	
39 Eco-Capitalism	Paul Hawken, Amory & Hunter Lovins	Hawken et al. (2000)
40 Ecological Market Economy	Ökosoziales Forum	<a href="http://www.oesfo.at">www.oesfo.at</a>
41 Free Money	various	<a href="http://www.inwo.de">www.inwo.de</a>
42 New Work	Frithjof Bergmann	<a href="http://www.dorfwiki.org/wiki.cgi?NeueArbeit/public/NeueArbeitTexte">www.dorfwiki.org/wiki.cgi?NeueArbeit/public/NeueArbeitTexte</a>

**Table 2:** List of references for the approaches shown in table 1

Group of approaches in figure 1	Approaches	Catchwords searched by Google	WWW-entries
Market Reforms	Emissions Trading	"Emission trading"	577 000
	Ecological Tax Reform	Ecological Tax Refor	154 000
	Eco-Capitalism	Eco-Capitalism	6 630
	Ecological Market Economy	"Ökosoziale Marktwirtschaft"	9 040
Free Money	Free Money	Local currency	3 240 000
New Work	New Work	New Work Bergman	3 100 000
Steady-State-Paradigm	Cap and Share	"Cap and Share"	9 700
	Oil Depletion Protocol	"Oil depletion protocol"	44 200
	Personal Carbon Trading	"Personal carbon trading"	35 800
	Sun-Economy	Sonnenökonomie Aubauer	7
	Steady-State-Economy	"Steady-State-Economy"	45 300
Anti-Globalization-Mainstream	Global Keynesianism	Attac	4 150 000
	Market Socialism	"Market socialism"	91 200
Eco-Socialism (Sarkar)	Eco-Socialism	Eco-socialism Sarkar	1 520
Reembedding Economy	Reembedded Economy	Elmar Altvater	41 300
	Localism	Relocalisation	190 000
	De-Globalization	De-Globalization	25 800
	Revolutionary Reforms	Mohssen Massarrat"	9 430
Rebuilding Society	Subcoma	Subcoma	4 080
	Subsistence Economy	Ecofeminism	158 000
	Anti-Economy	Robert Kurz Krisis	468 000
	Global Villages	Global Villages Nahrada	3 100
	Solidarity Economy	"Economia Solidaria"	650 000
	Local Exchange Trading Systems	"Local Exchange Trading Systems"	12 100
	Participatory Economics	Parecon	174 000
	Dual Economy	Dual economy Gorz	15 100
	Revolutionary Economy	Willem Hoogendijk Economic Revolution	409
	The simpler way	The simpler way Ted Trainer	95 200
	Caring Labour	"Care economy"	85 000
	Peer Economy	Peer Economy Siefkes	3 730
	Gift Economy	"Gift Economy"	124 000
	Libertarian Municipalism	"Libertarian Municipalism"	6 120
	Free Cooperation	Freie Kooperation Spehr	5 270
New Socialism	Radical Reformism	"Radikaler Reformismus"	517
	Post-Capitalism	"Immanuel Wallerstein"	412 000
	User-Oriented Supply-Economy	Versorgungswirtschaft Fresin	186
	Operaism	Empire Hardt Negri	39 700
	Free Doing	John Holloway Marxism	279 000
	Practical Socialism	Praktischer Sozialismus Krahl-Institut	67
	Integrated Society	Integrierte Gesellschaft Ehlers	14 600
	New Socialism	New Socialism Cockshot	96
	Socialism	Trotskyism	271 000

**Table 3:** Discursive weights for different approaches for socio-ecological change of the society used in figure 2

Catchwords best matching the approach were searched by Google and those with highest numbers of entries were selected for each approach. Quotation marks indicate that the exact phrase was searched. The first column gives the clustering of approaches used in figure 2. The clusters were calculated by TWINSPAN (see table 1) except Free Money and New Work, that are separated, and the TWINSPAN-subgroups of Rebuilding Society and New Socialism, that are not differentiated in figure 2

