



WORKSHOP 1 What's the problem?



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System diagrams for a common understanding

In our first workshop we applied the method Causal Loop Diagrams method (CLD) to make the participants' implicit system understanding explicit and to visualise it. The participants worked in five groups to develop system diagrams to explain the temporal development of five indicators five indicators over time:

1. Energy poverty (SDG1/10)
2. Work satisfaction (SDG8)
3. Real GDP per capita (SDG8)
4. Greenhouse gas emissions from buildings (SDG13)
5. Total greenhouse gas emissions (SDG13)

The most important findings from the participants' system diagram

The figure visualises the most important impact chains and feedback loops resulting from the composition of all system diagrams. The variable household income became the linking element between all system diagrams. Feedback loops can have a reinforcing ('R') or balancing ('B') effect.

An example of a reinforcing feedback loop from the figure is: if household income increases, the living space per person increases, which stimulates construction activity, which in turn increases household income, etc.

An example of a balancing feedback loop from the figure is: if real GDP per capita increases, the use of resources increases, which leads to higher environmental pollution and thus to greater uncertainty. As a result, consumption decreases and real GDP per capita decreases, etc.

At least three conclusions can be drawn from the large number of impact chains and feedback loops. conclusions can be drawn:

1. There are synergies between reducing energy poverty (SDG1/10), increasing work satisfaction (SDG8) and increasing real GDP per capita (SDG8) ...
2. ... but a trade-off between reducing greenhouse gas emissions (SDG13) and achieving these other SDG indicators.
3. the impact chain between real GDP per capita and environmental pollution indicates that the participants see limits to growth.



Key:
R: reinforcing loop +: if variable A increases, variable B increases as well
B: balancing loop -: if variable A increases, variable B declines

red arrows: causal loops derived from SDG1 (Energy poverty rate)
orange arrows: causal loops derived from SDG8 (Work satisfaction)
pink arrows: causal loops derived from SDG8 (Real GDP per capita)
blue arrows: causal loops derived from SDG13 (THG – Buildings)
green arrows: causal loops derived from SDG13 (THG – Total)

Note: Some impact chains are shortened or hidden for a better overview.

Figure: Selected impact chains and feedback loops of the participants' system diagrams