



Monday 31 May 2021

Foundation of Complexity 3

# an introduction to multiple capitals

Session 1/2/3

**what is the function of capital in complexity?**



**the traditional view of capital**



“

**that part of man's stock which he expects to afford him  
revenue.**

”

- Adam Smith









**ingredients** .....→ **cooking** .....→ **meal**



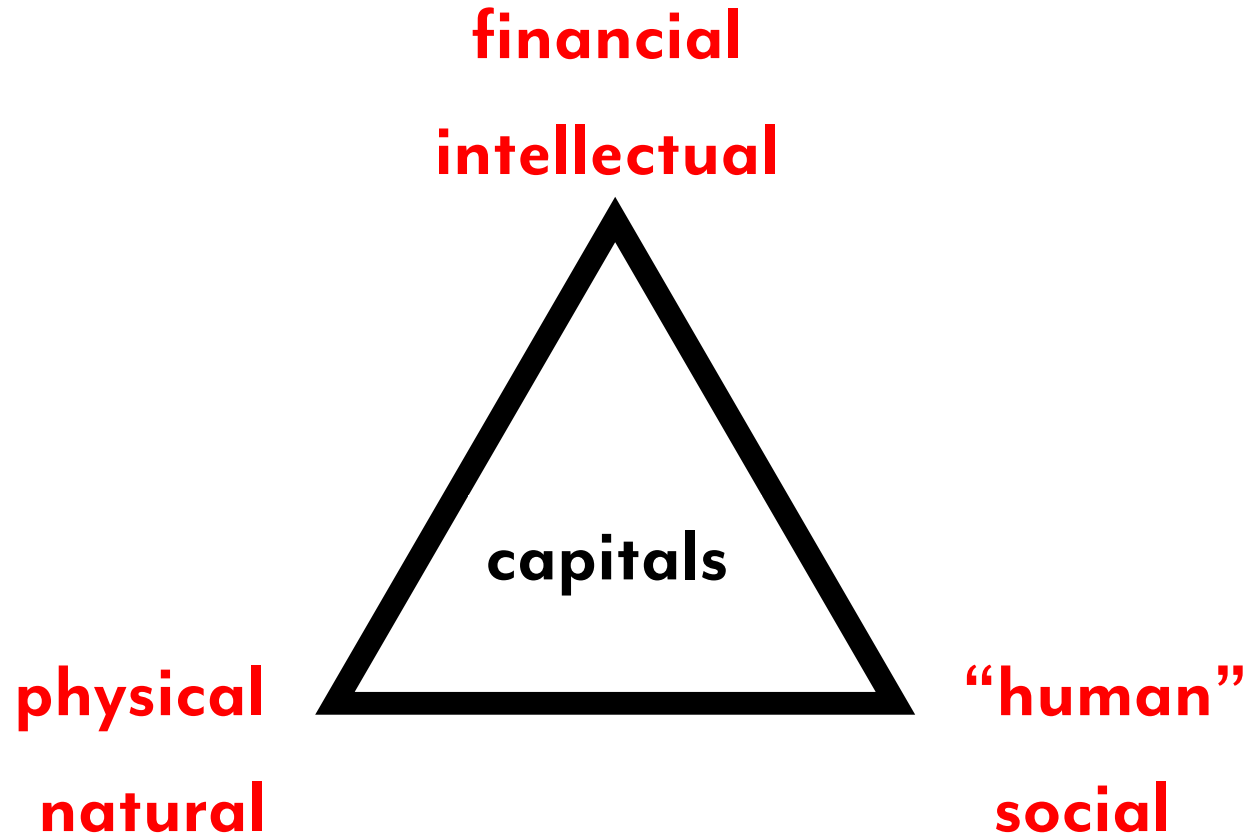


# **a view of capital in complex systems**



## **axiom 18**

**there are multiple forms of capital**





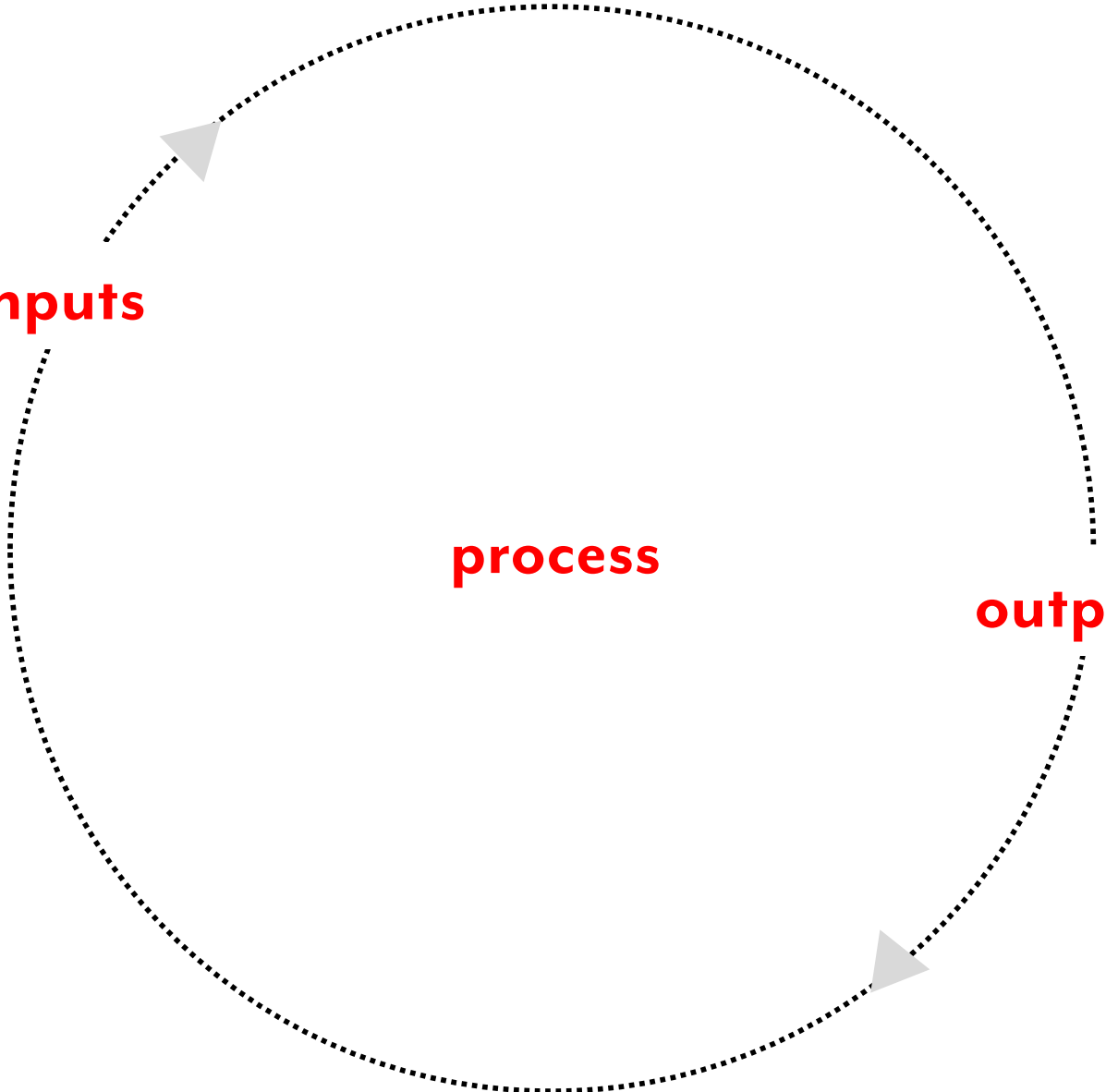
## **axiom 19**

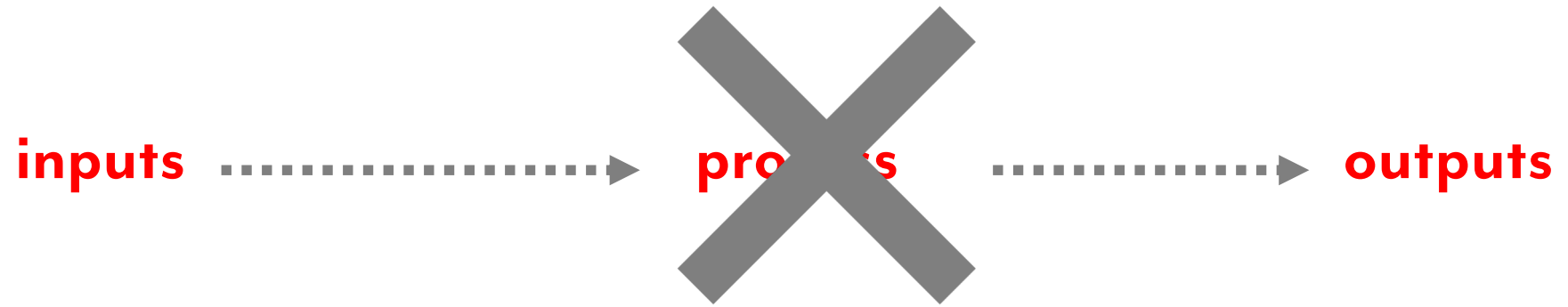
**linear process don't exist in nature or elsewhere**  
(even though we like to pretend they do)

**inputs**

**process**

**outputs**





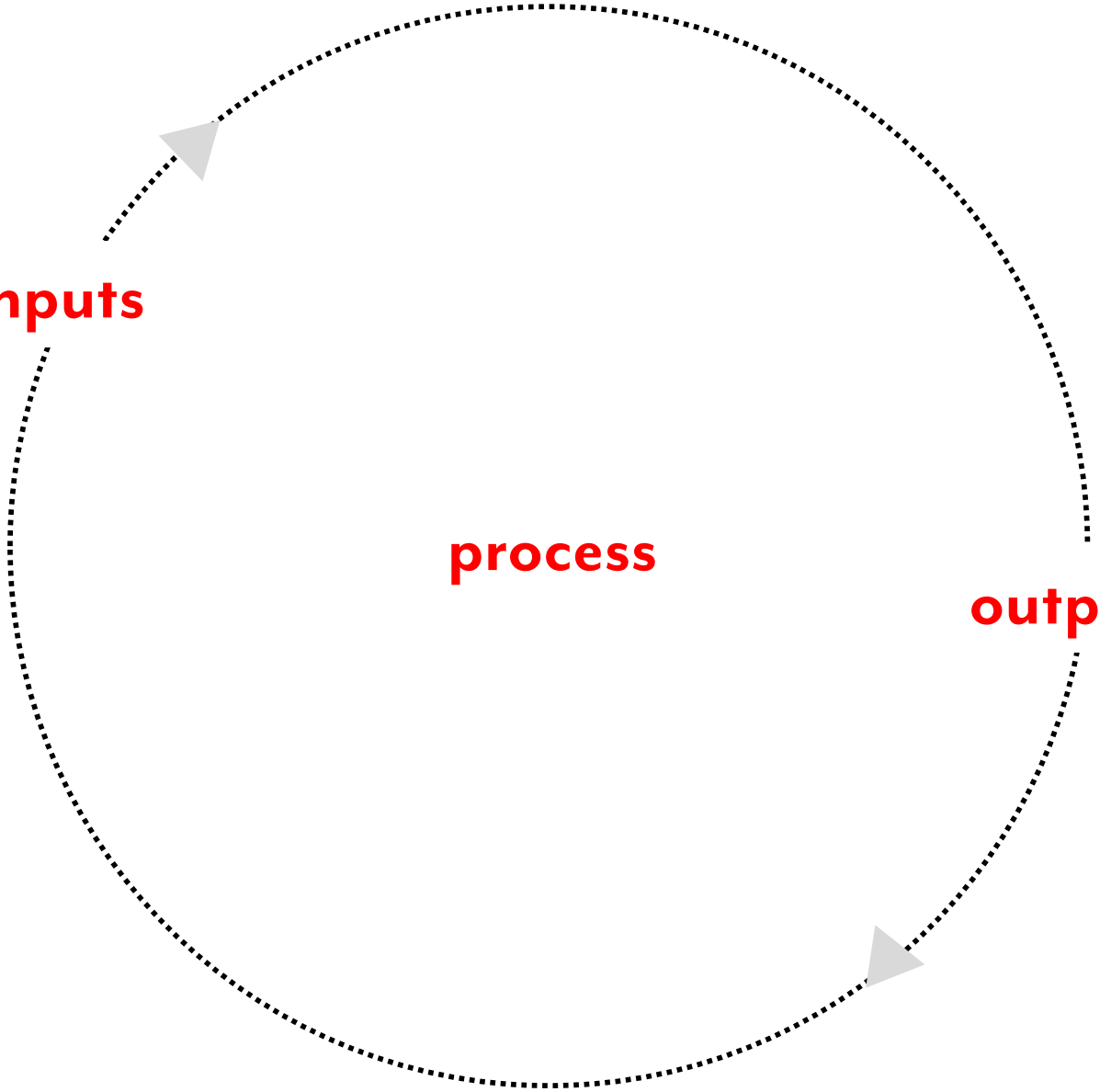


**there is no such thing as “waste” in nature (other than heat)  
but human-designed processes typically generate “waste”**

**inputs**

**process**

**outputs + waste**







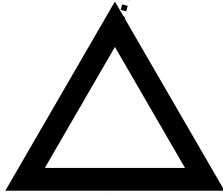
**sustainability means “closing the loop” = all outputs  
are “recycled” to become “inputs” with minimal “waste”**



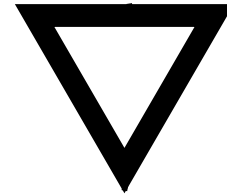
## **axiom 20**

**in any healthy system inputs and outputs are balanced**

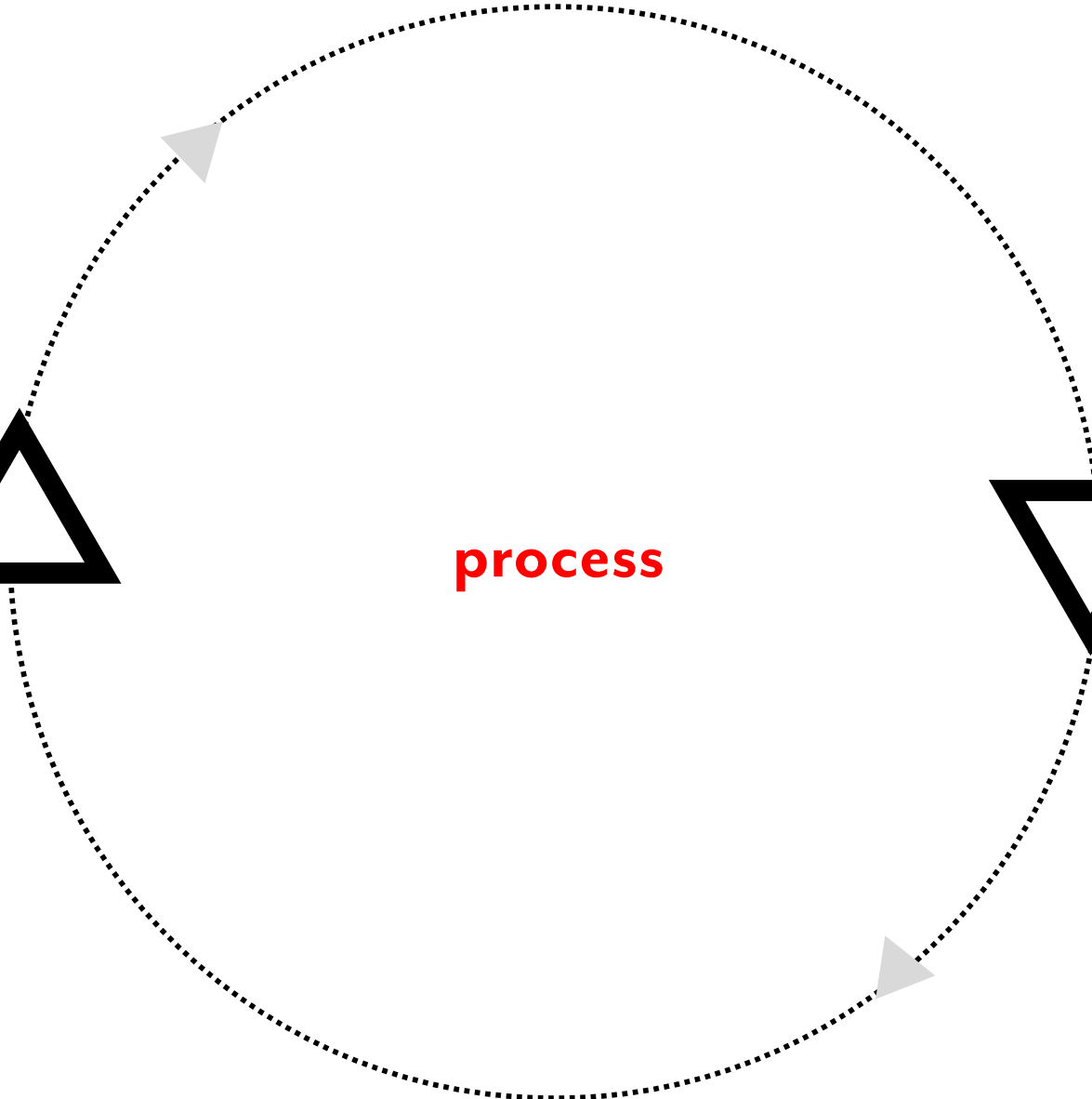
**inputs**



**process**



**outputs**





**all processes using energy generate “waste” while  
efficient processes only generate heat as “waste,”  
inefficient processes generate “wastage” ie. outputs  
that are not, or cannot be, re-used**



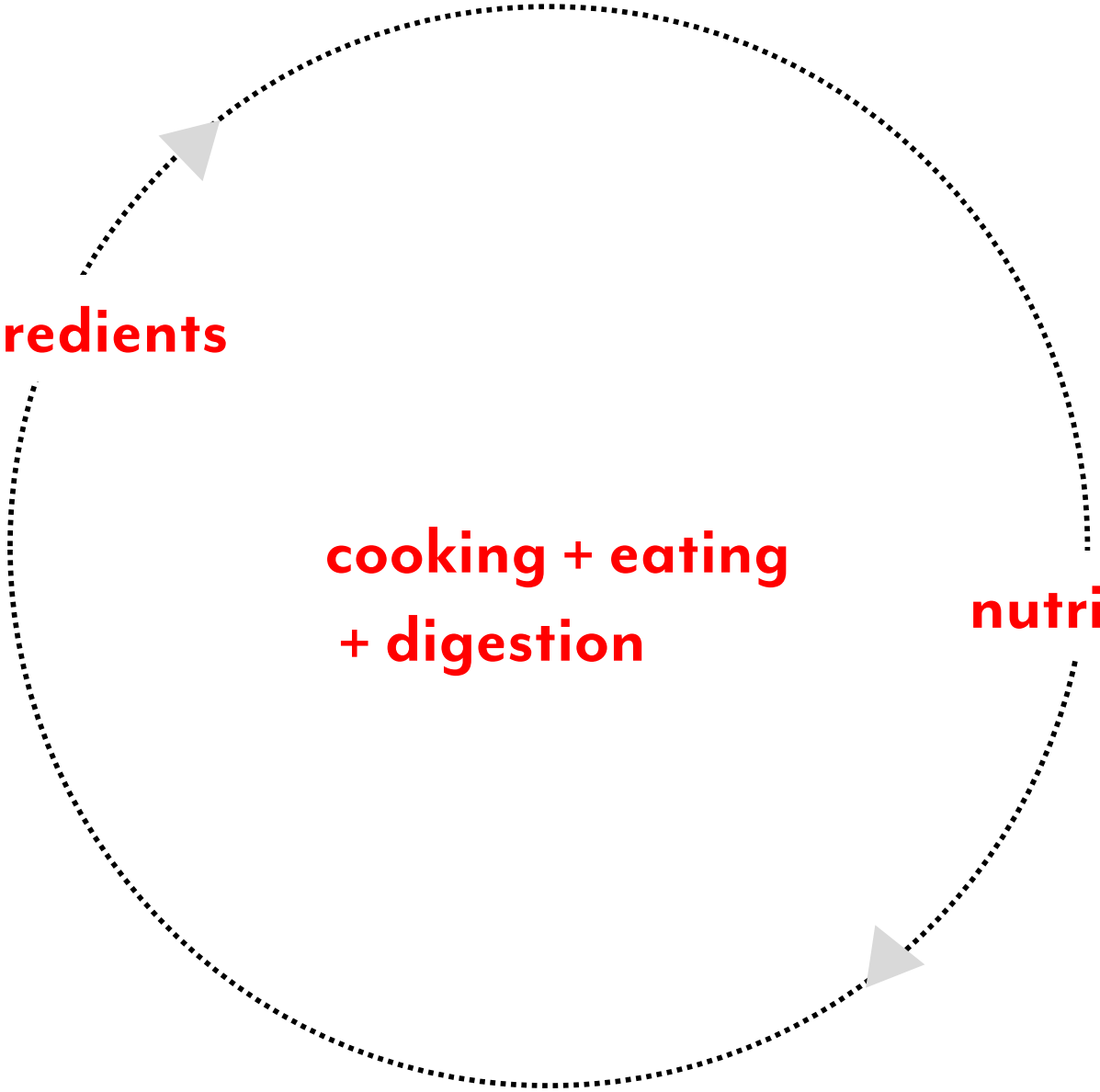
**what does it mean to eat “sustainably”?**



**ingredients**

**cooking + eating  
+ digestion**

**nutrition + energy  
+ waste**





**adults need between 2000-2500 calories per day**



**2500 calories**





**what does it mean to eat “sustainably”?**



**2500 = 2500 calories = maintenance**



**2500** < **2500 calories** = **?**



**2500**

**<**

**2500 calories**

**=**

**starve**



**2500** > **2500 calories** = **surplus**



**what happens when you can't use the energy in  
your system?**



**you get sick**

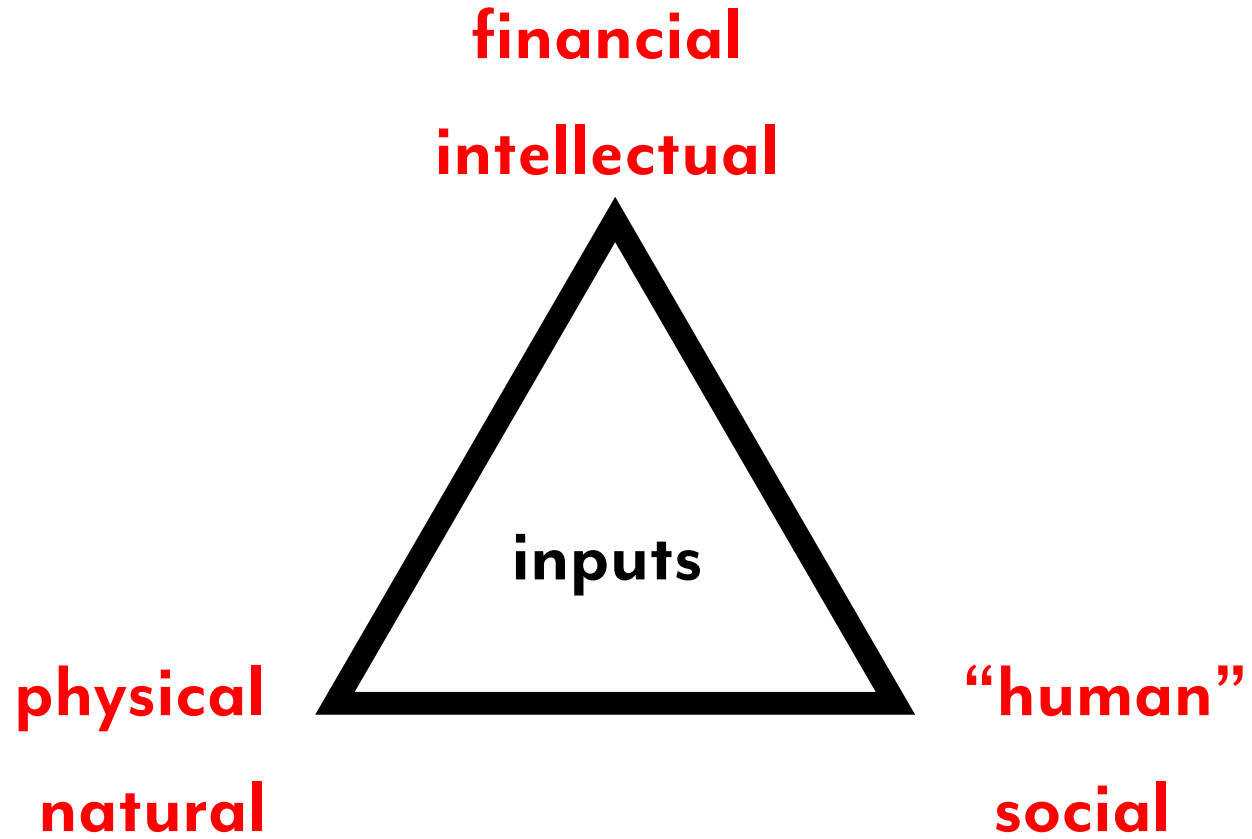


**it's exactly the same with capital**



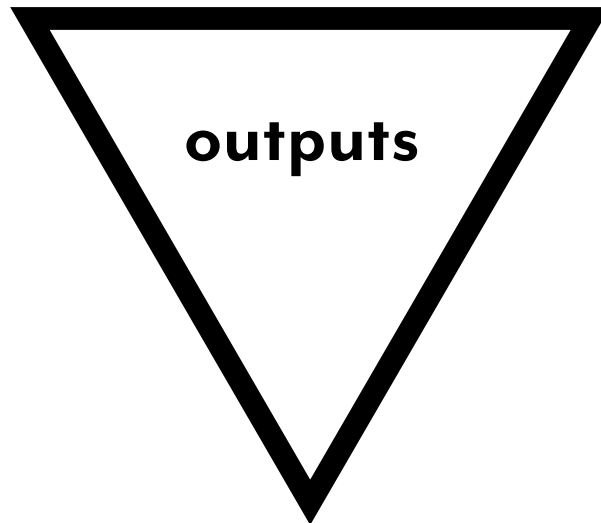


**it's exactly the same with capital “calories”**  
**= multiple forms of capital**





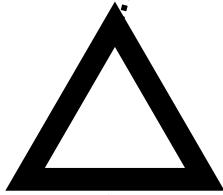
**physical**  
**natural**



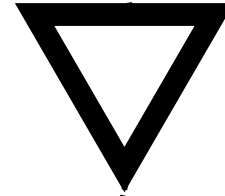
**“human”**  
**social**

**financial**  
**intellectual**

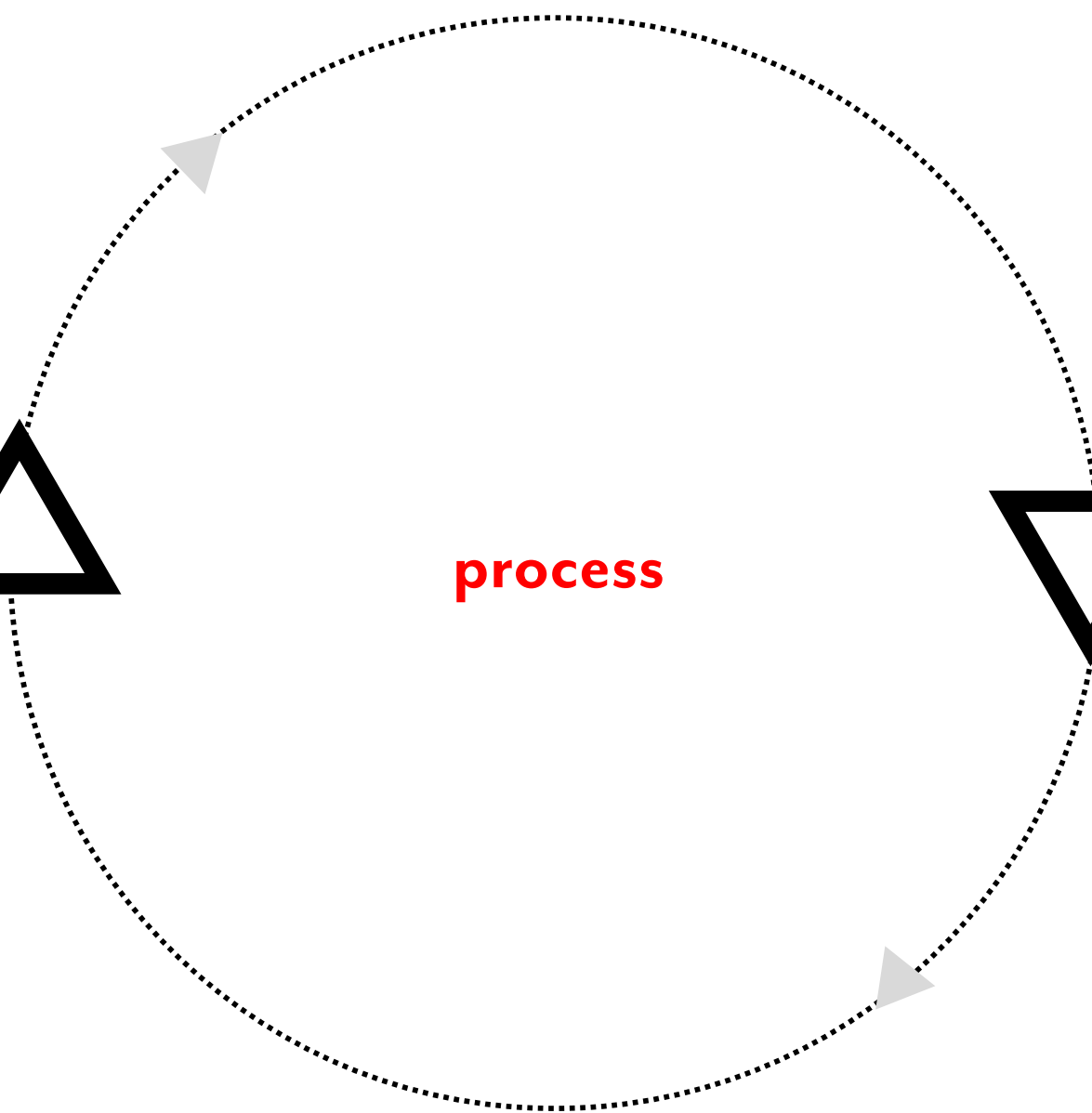
**inputs**



**process**



**outputs**





## **axiom 21**

**all complex organisms require energy, the more complex  
the more energy they need**

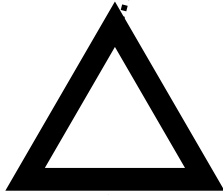


**we have built high-growth complex societies with  
high energy needs**

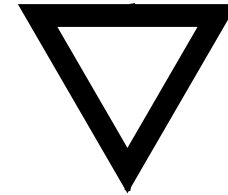


**all processes using energy generate “waste” while  
efficient processes only generate heat as “waste,”**

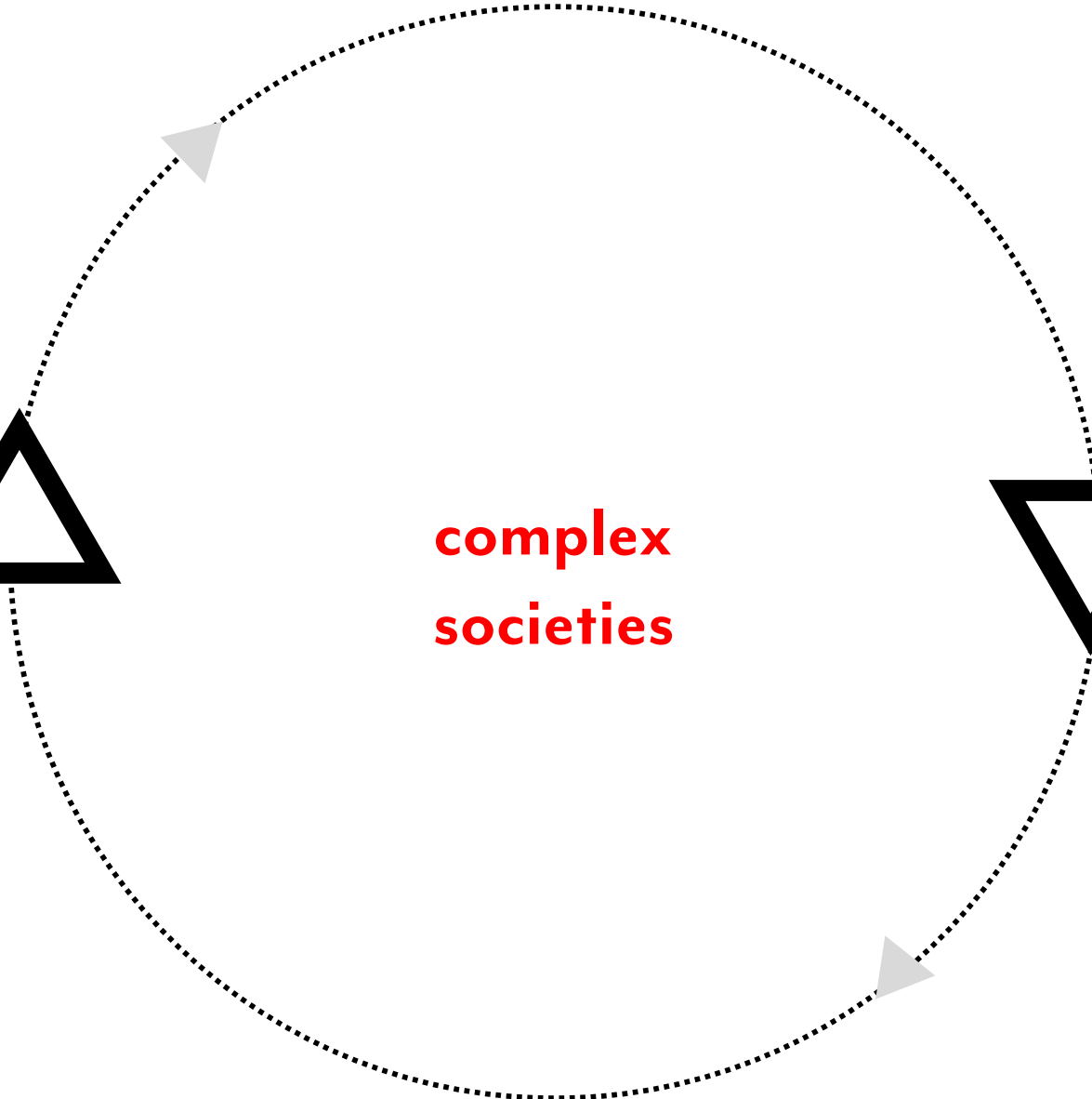
**inputs**



**complex  
societies**



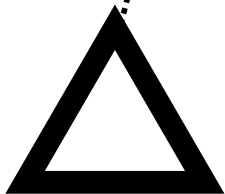
**outputs  
+ waste**



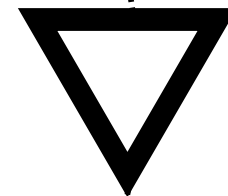




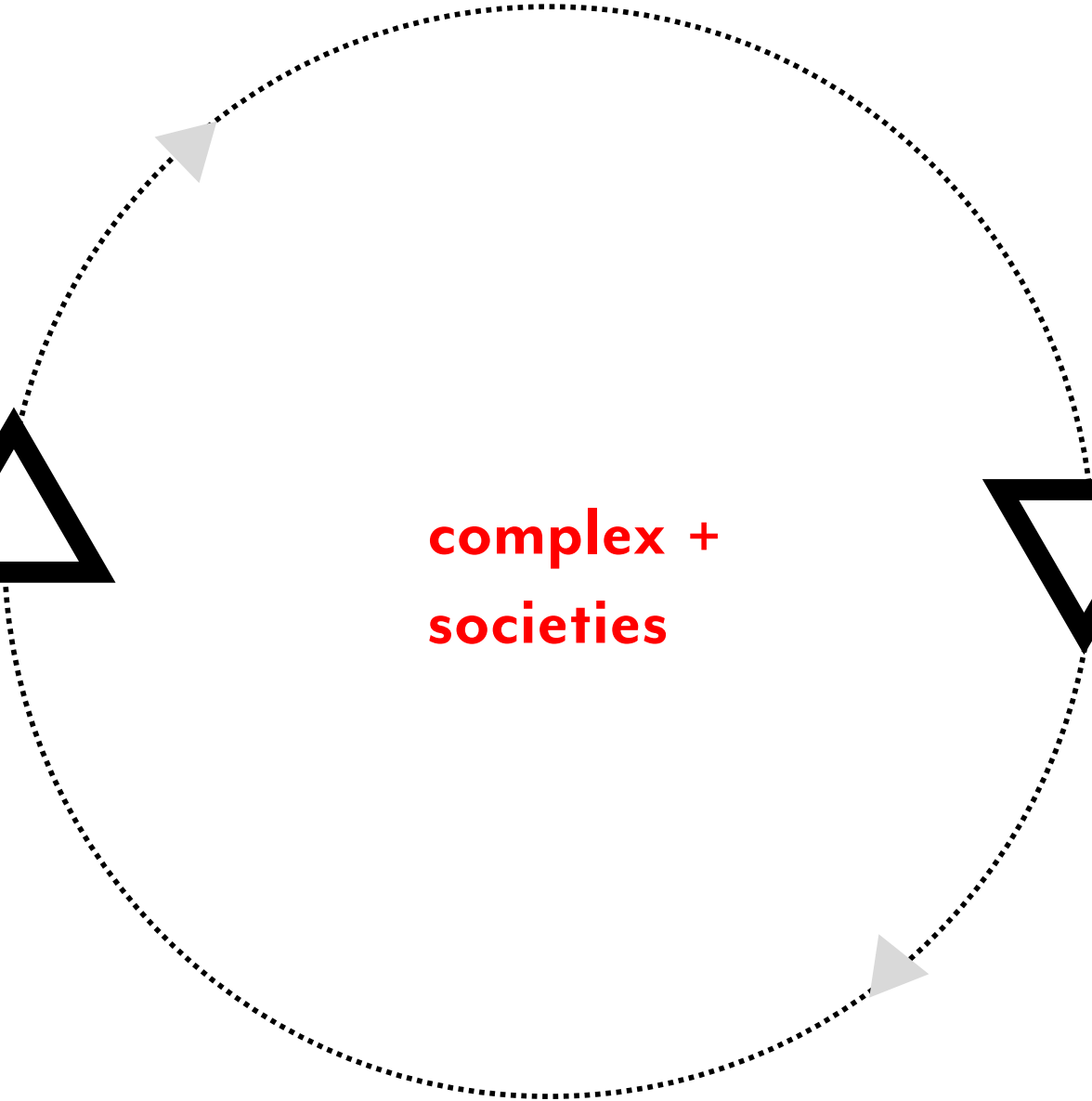
**+ inputs**



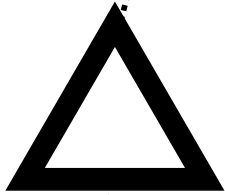
**complex +  
societies**



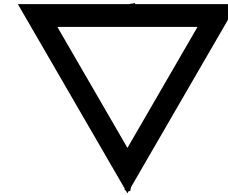
**outputs  
+ waste +**



**++ inputs**

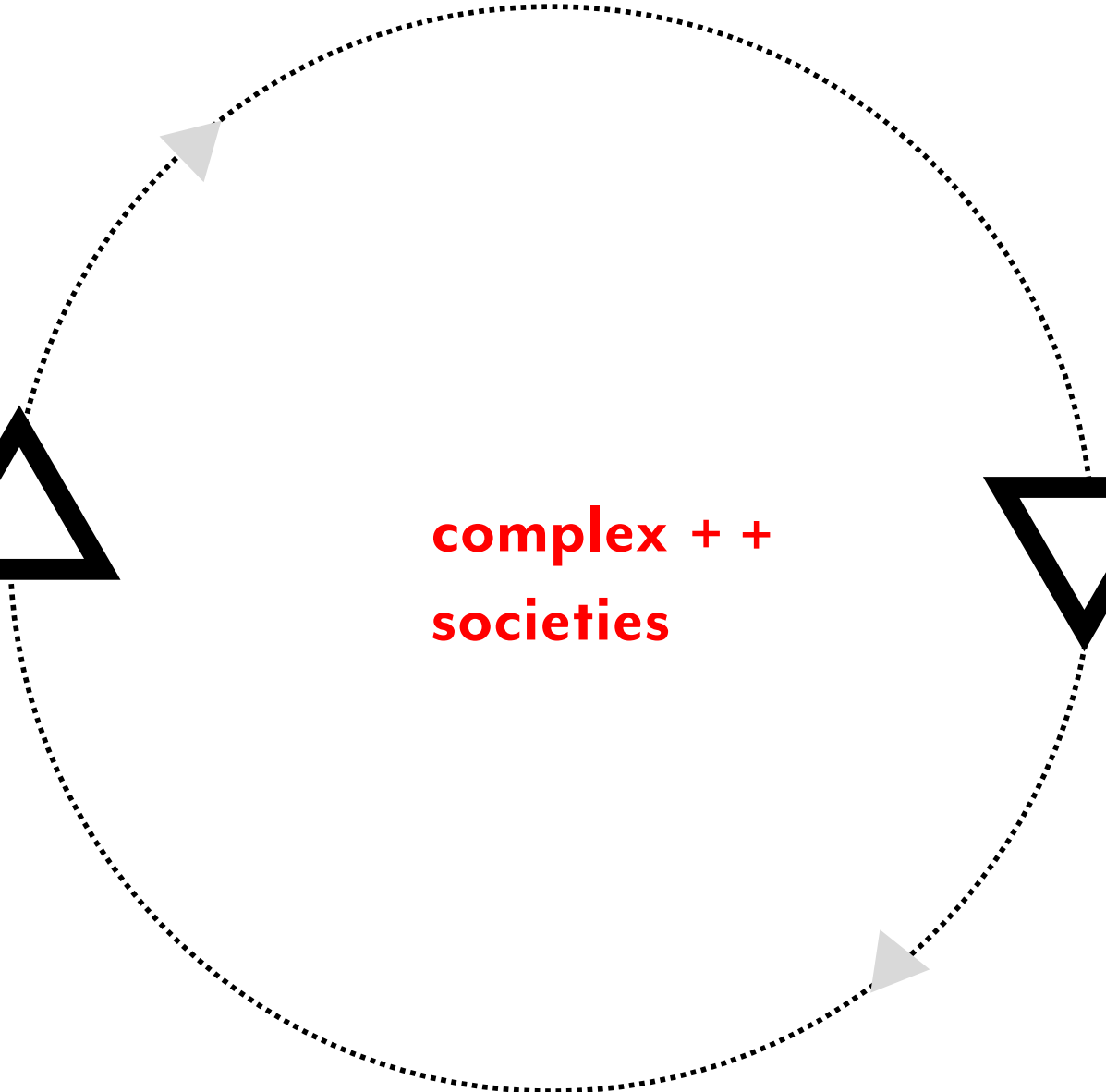


**complex ++  
societies**



**outputs**

**+ waste ++**



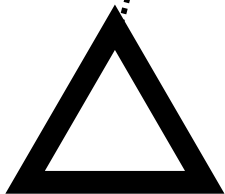


## **axiom 22**

**when societies grow too complex to maintain, they go through collapse – going from complex to less complex**



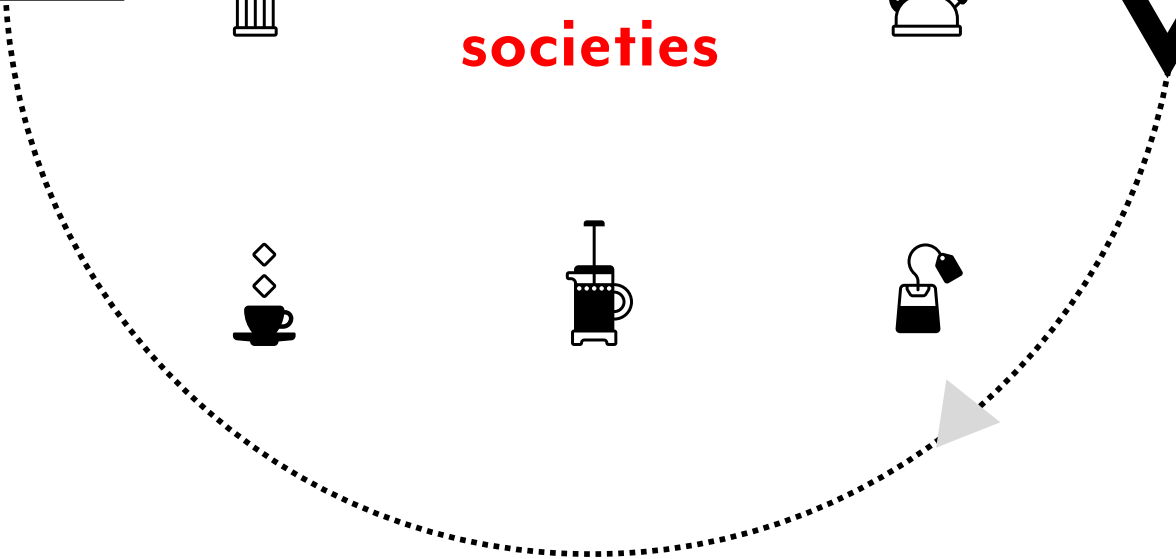
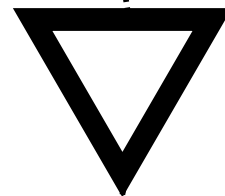
inputs



**complex  
societies**

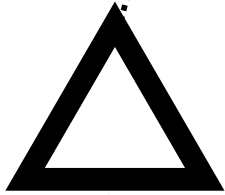


outputs  
**+ waste**



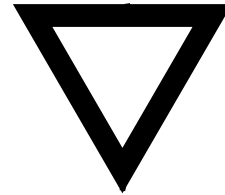


inputs



**complex  
societies**

outputs  
**+ waste**





**this is called a “maintenance crisis” followed by  
“catabolic collapse”**



> **“2500 calories”** <



**“sick”**

**>**

**“2500 calories”**

**<**

**collapse**





**“sick”**

**>**

**“2500 calories”**

**<**

**collapse**



**anabolic  
growth**

>

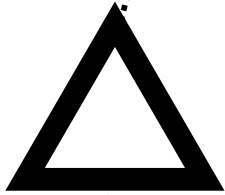
**“2500 calories”**

<

**catabolic  
collapse**

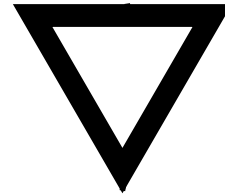


inputs



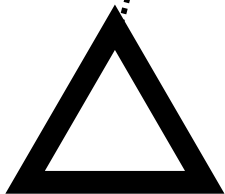
**complex  
societies**

outputs  
**+ waste**





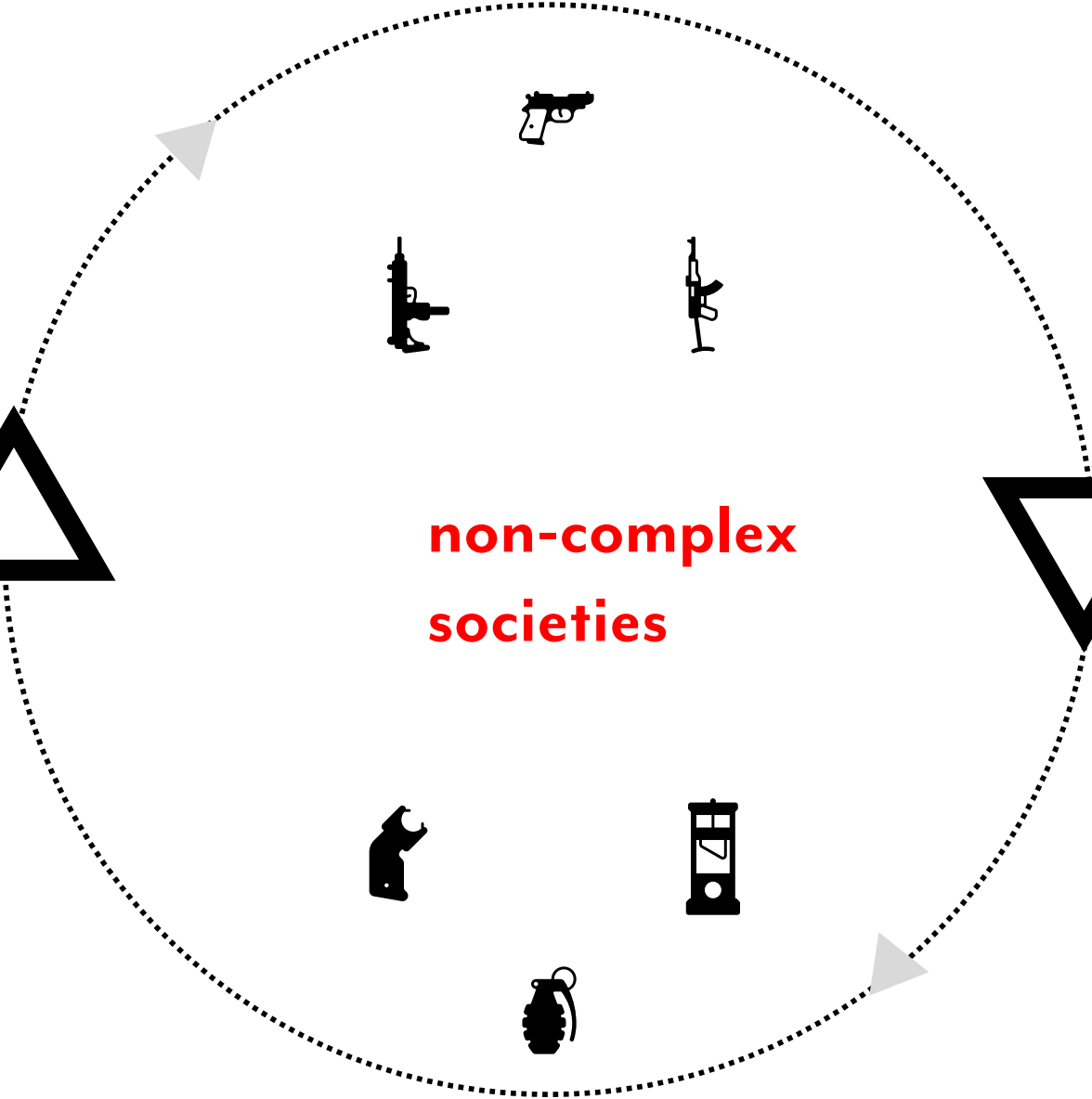
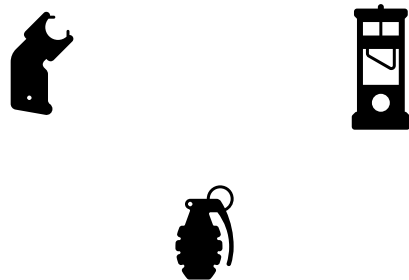
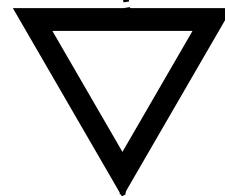
**inputs**



**non-complex  
societies**



**outputs  
+ waste**





**some parts of society has massive capital surpluses  
while others have depreciating capital stocks**



**it isn't a simple matter of redistribution, we are living  
“within” several systems that are constitutionally  
unhealthy ie in a maintenance crisis or collapsing**

**HIGHLAND PARK, Mich. — When the sun sets in this small city, its neighborhoods seem to vanish. In a deal to save money, two-thirds of the streetlights were yanked from the ground and hauled away this year, and the resulting darkness is a look that is familiar in the wide open cornfields of Iowa but not here, in a struggling community surrounded on nearly all sides by Detroit.**

**Highland Park's circumstances are extreme; with financial woes so deep and long term, it has extinguished all but 500 streetlights in a city accustomed to 1,600, utility company officials say. But similar efforts have played out in dozens of towns and cities, like Myrtle Creek, Ore., Clintonville, Wis., Brainerd, Minn., Santa Rosa, Calif., and Rockford, Ill.**

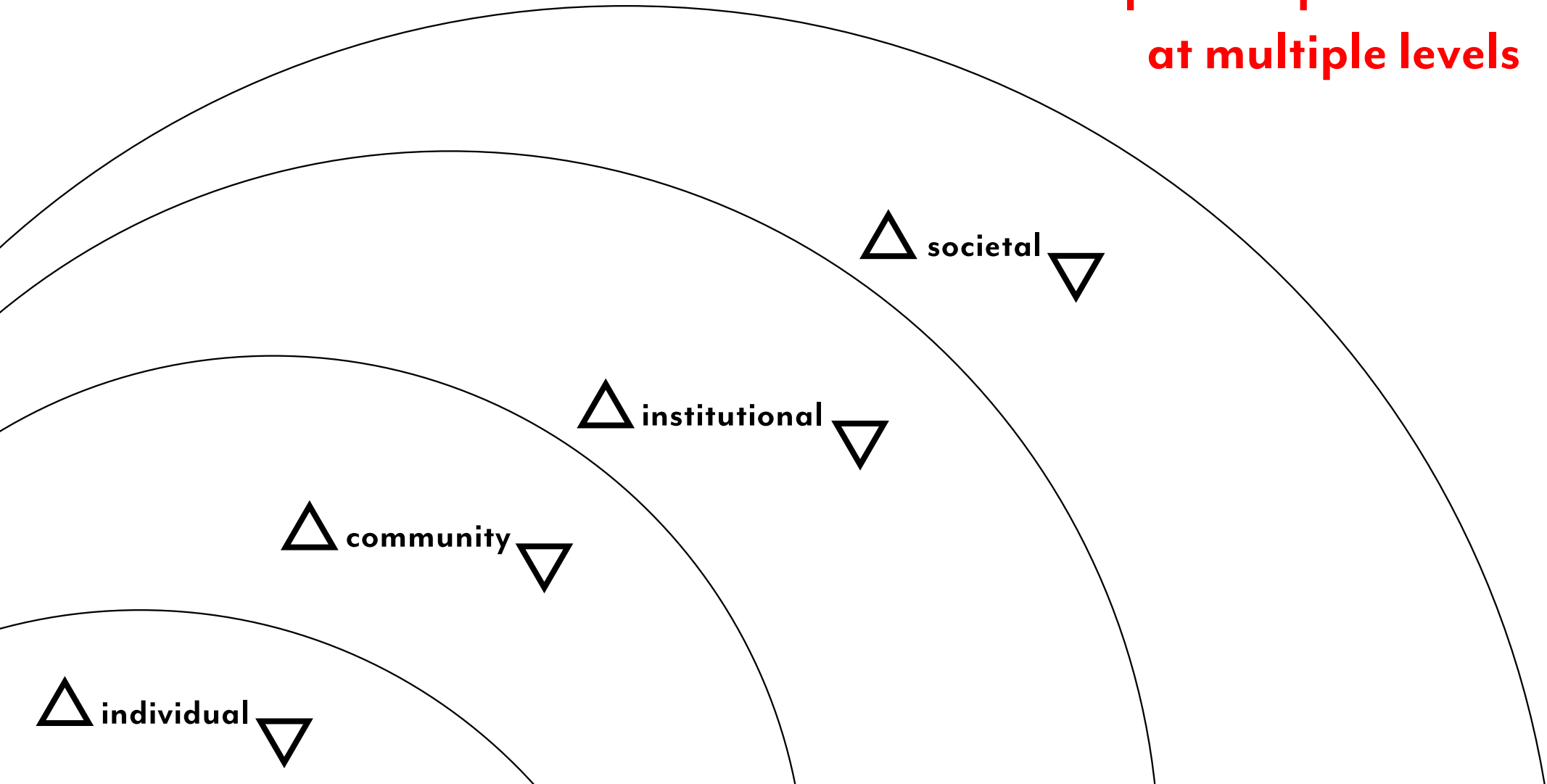
**Darker Nights as Some Cities Turn Off the Lights,  
New York Times, Dec 29, 2011**







# capital requirements at multiple levels





## **axiom 23**

**financial capital alone will never be sufficient to “buy” our way out of collapse ie. there will never be sufficient financial capital**



**why does this matter?**



**what are the practical implications?**



## **axiom 24**

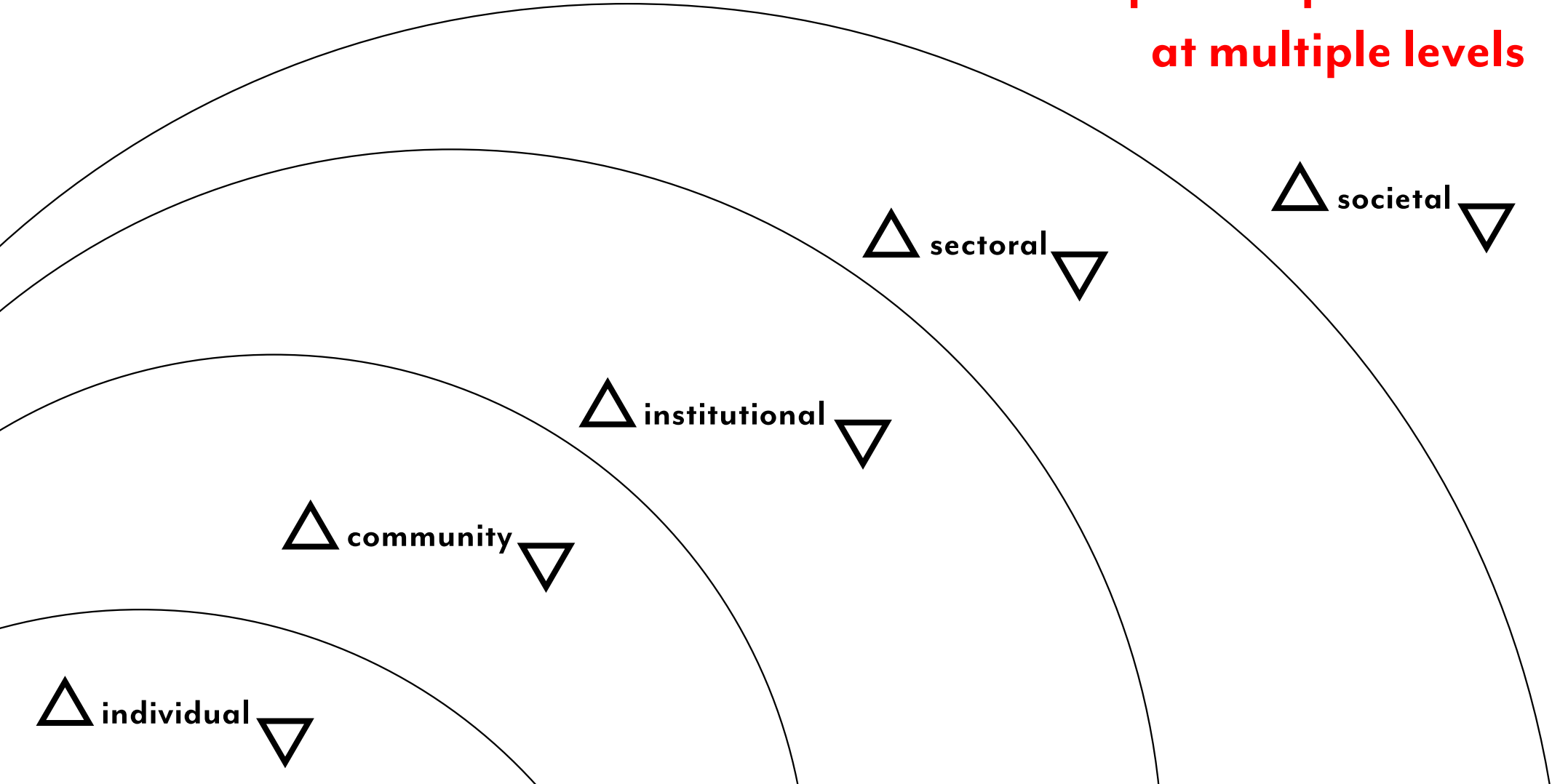
**tackling complex challenges require deliberate multiple  
capital strategies**



## homework

**pick a system you're a part of, (1) was this system in capital deficient or surplus pre-covid, and (2) what impact did covid have on this system?**

# capital requirements at multiple levels







Wednesday 2 June 2021

Foundation of Complexity 3

# an introduction to multiple capitals

Session 1/2/3



**a revolution in our view of capital**



**a revolution in our view of capital – capital is a relationship**

**[relationships are **not** a form of capital, but capital is a relationship we enter into...]**



“

**He discovered that capital is not a thing, but a social relation between persons, established by the instrumentality of things.**

”

- Karl Marx



**a revolution in our view of power**



**a revolution in our view of power –**

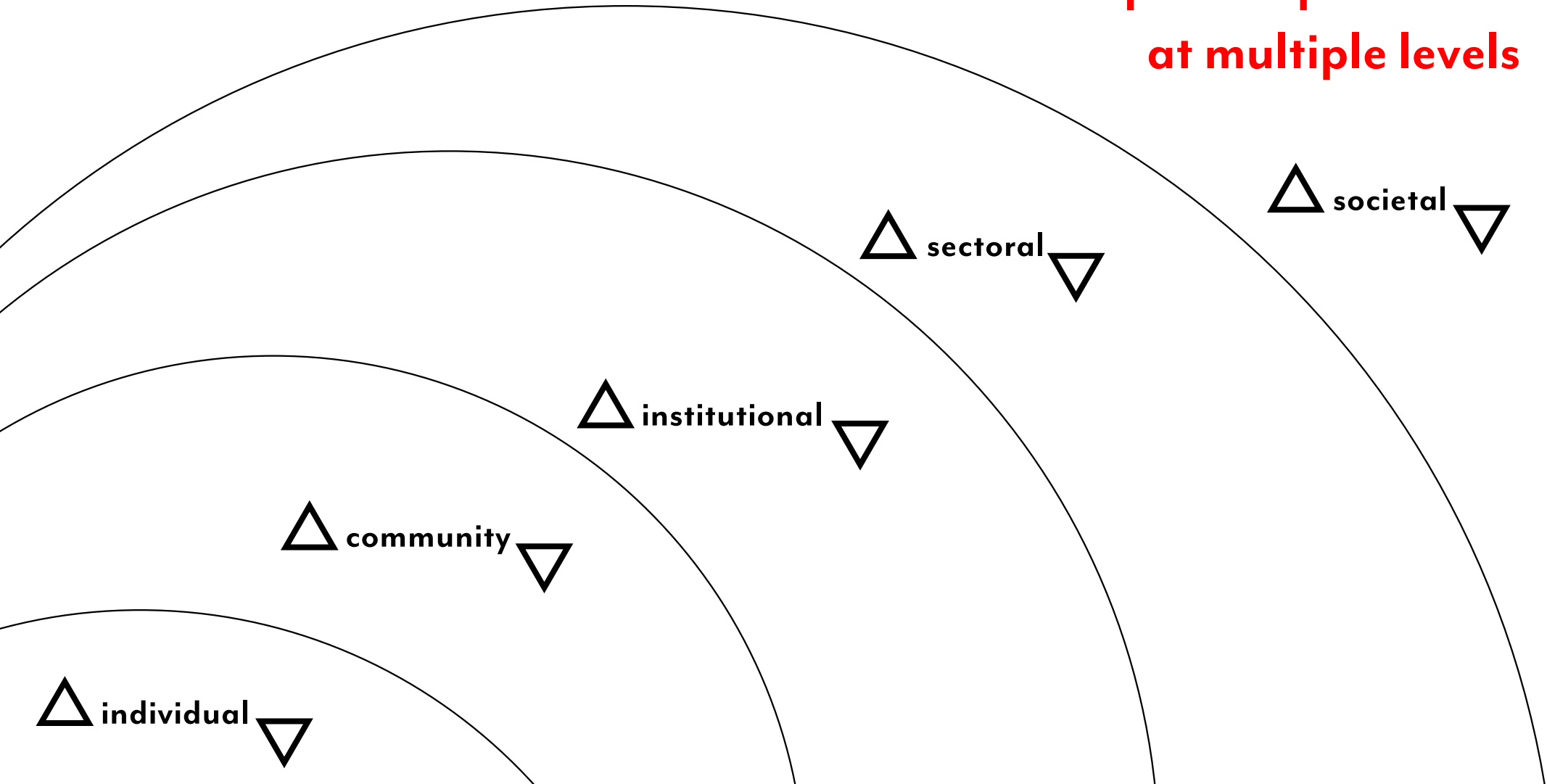
**we are the product of a relation of power ie. power is a  
characteristic of relationships**



## **axiom 25**

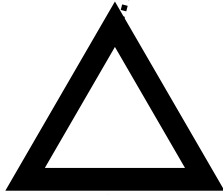
**capital is a social relation between people, mediated by multiple instruments and tools**

# capital requirements at multiple levels

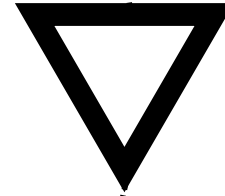




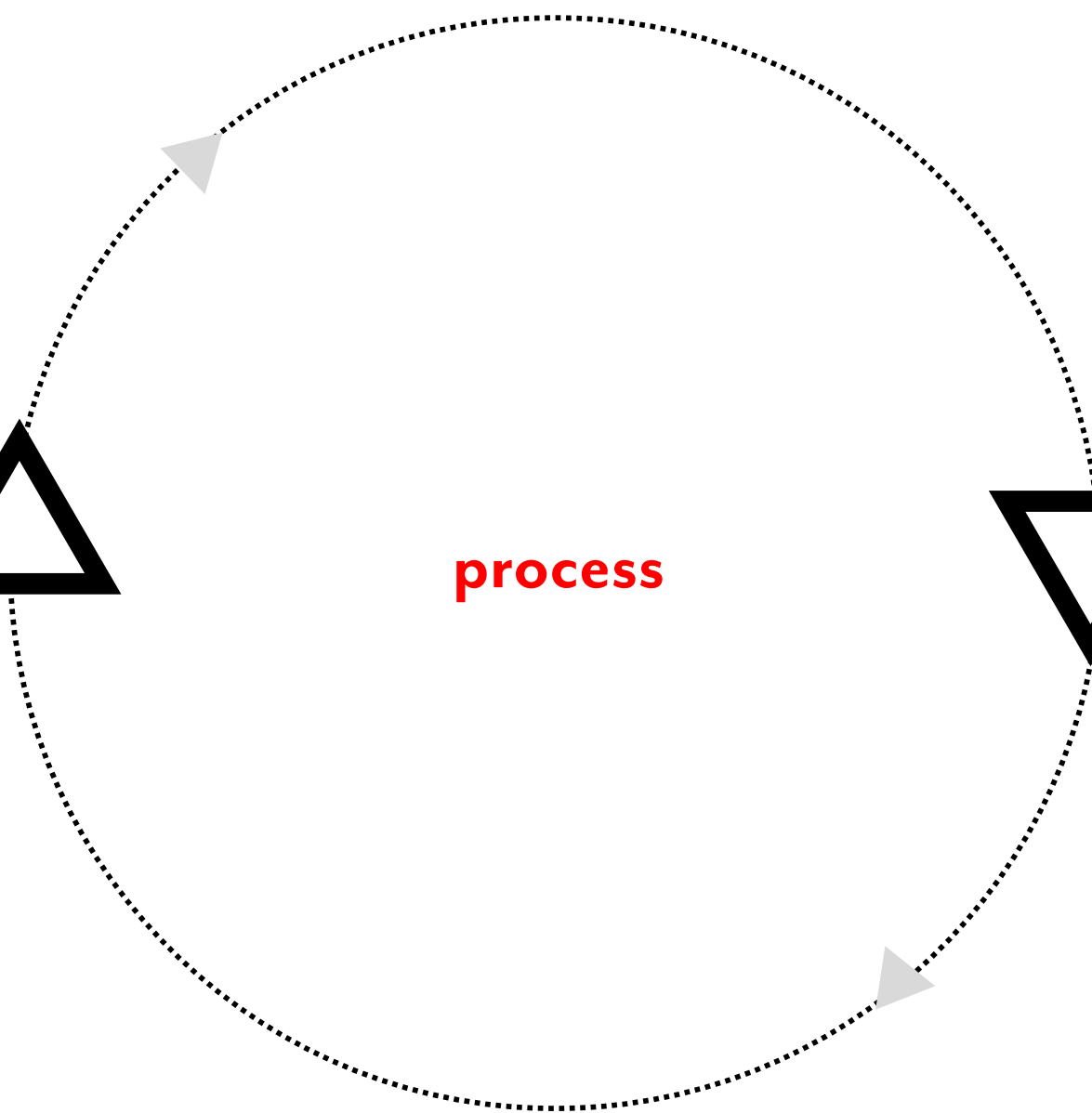
**inputs**



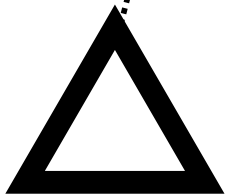
**process**



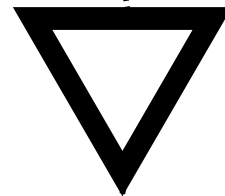
**outputs**



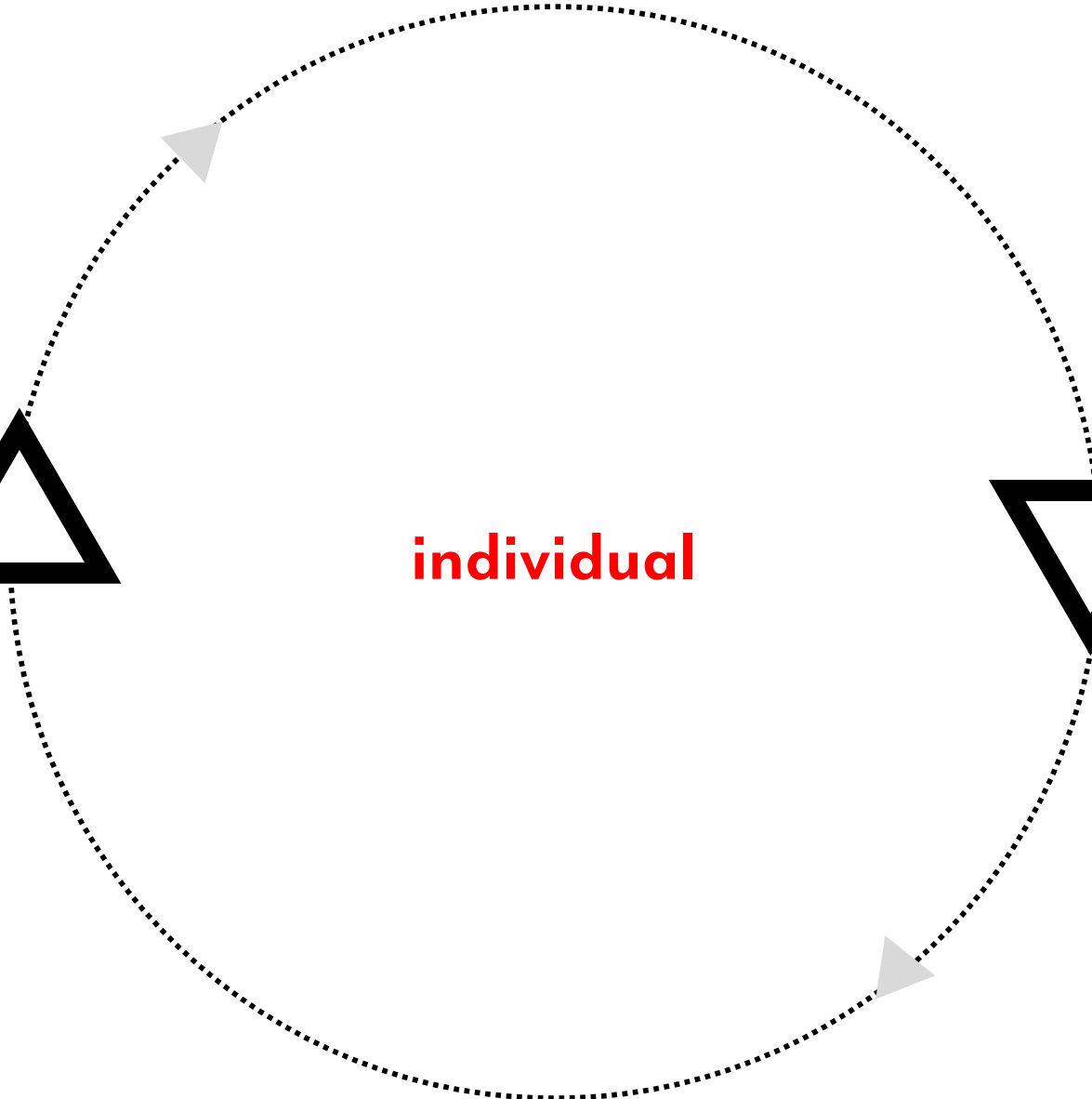
**inputs**



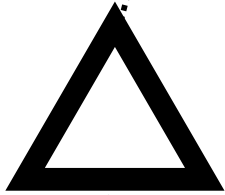
**individual**



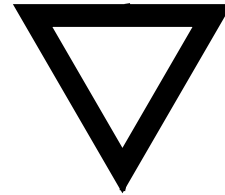
**outputs**



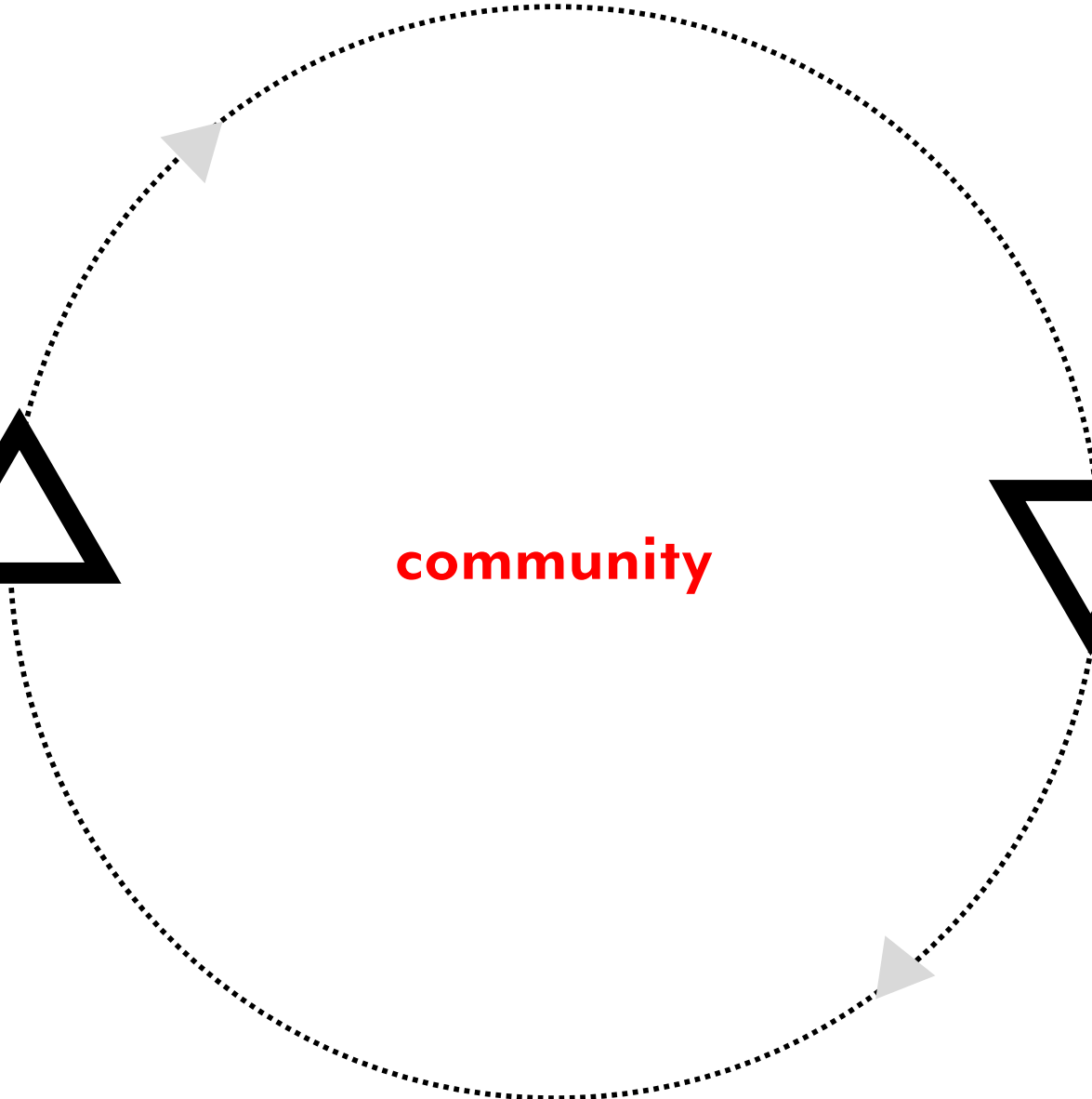
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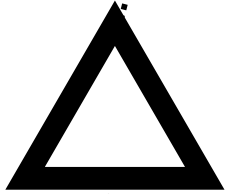
**community**



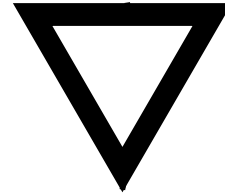
**outputs**



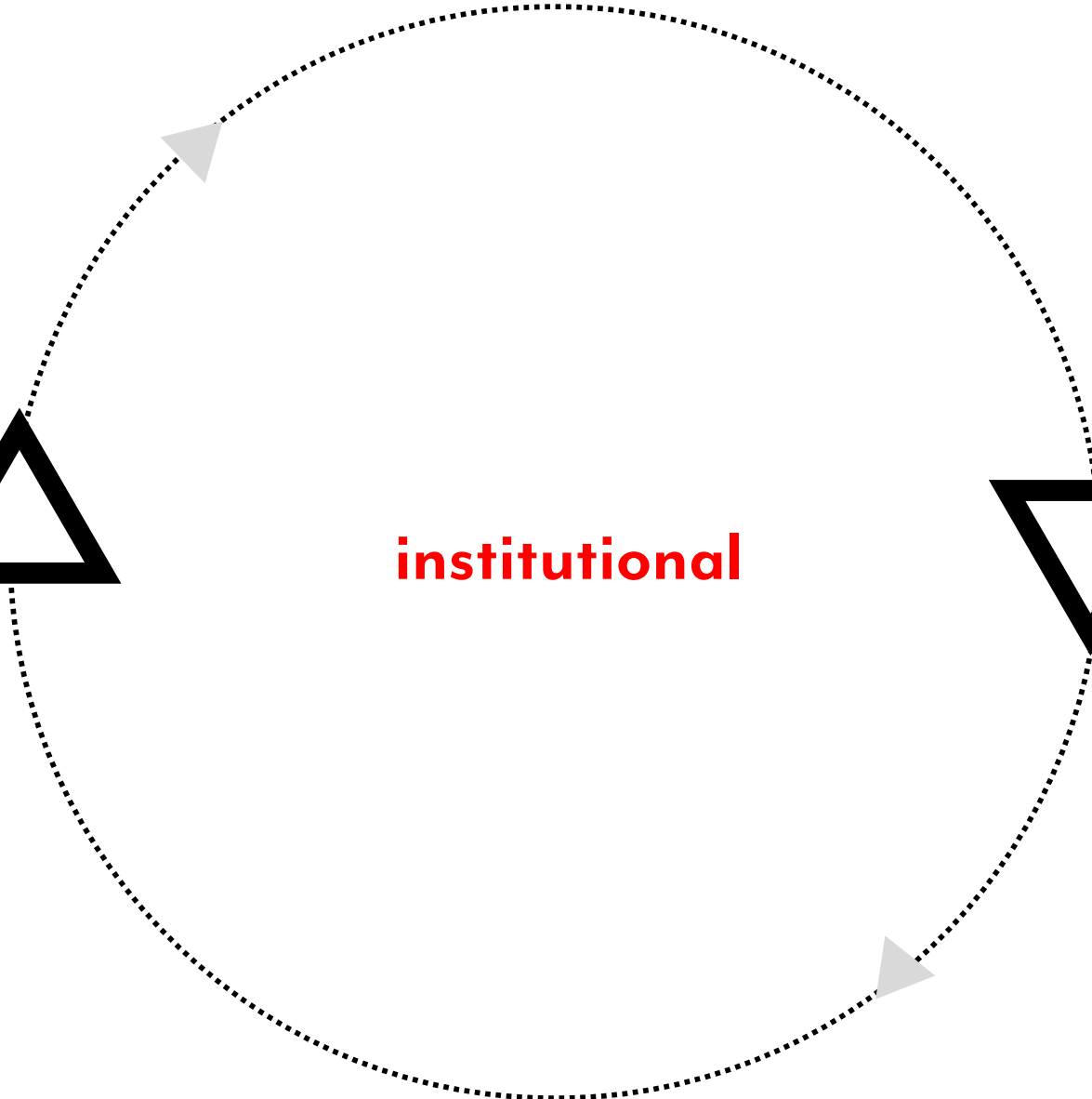
**inputs**



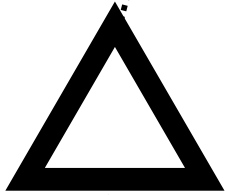
**institutional**



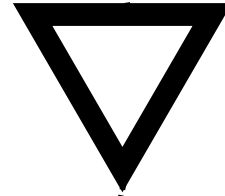
**outputs**



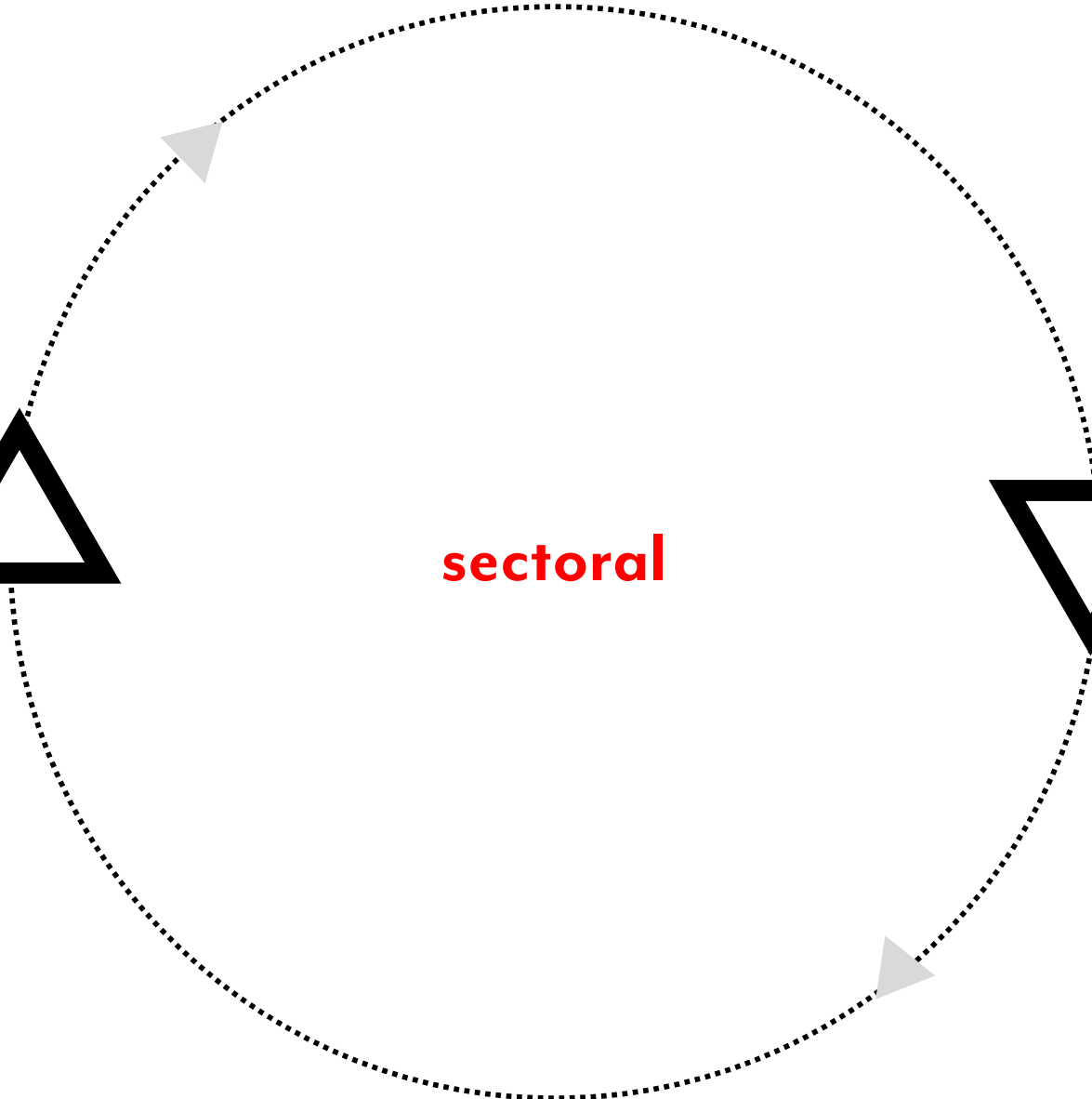
**inputs**



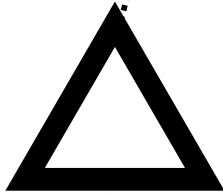
**sectoral**



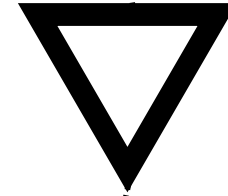
**outputs**



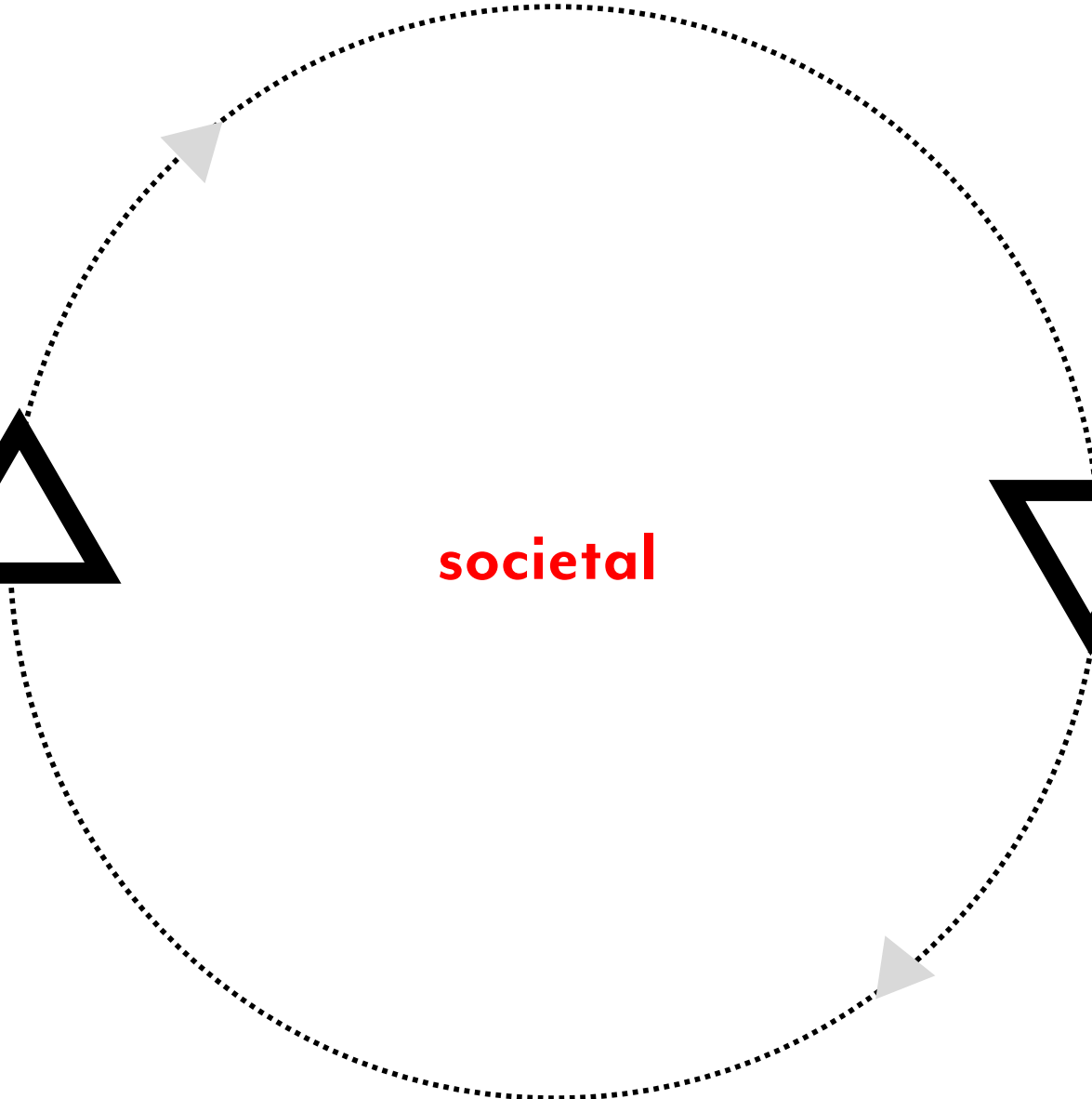
**inputs**



**societal**



**outputs**





**each level has a capital surplus re-cycling mechanism**

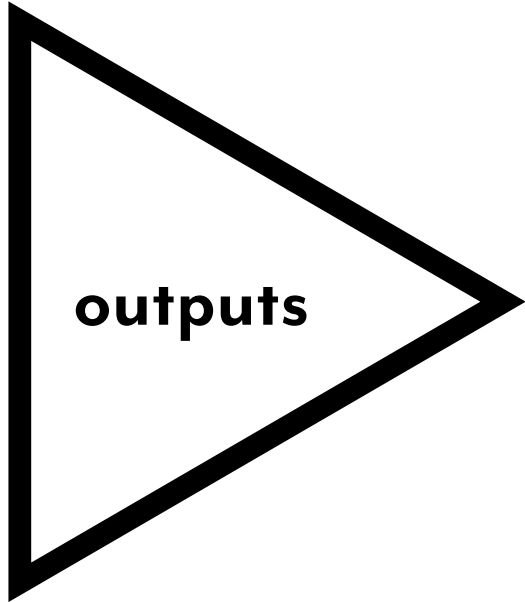


**each level has a capital surplus re-cycling mechanism**  
**each level provides inputs to other levels**





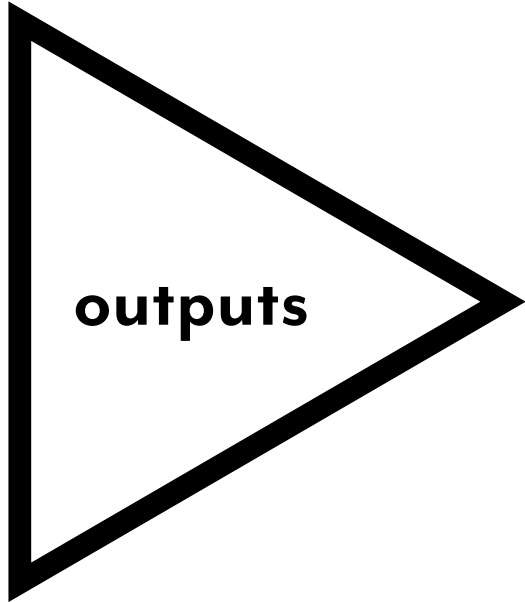
**what happens to the outputs from each level?**



**private?**

**commons?**

**public?**



**private** = capital flight

**commons** = shared

**public** = taxes



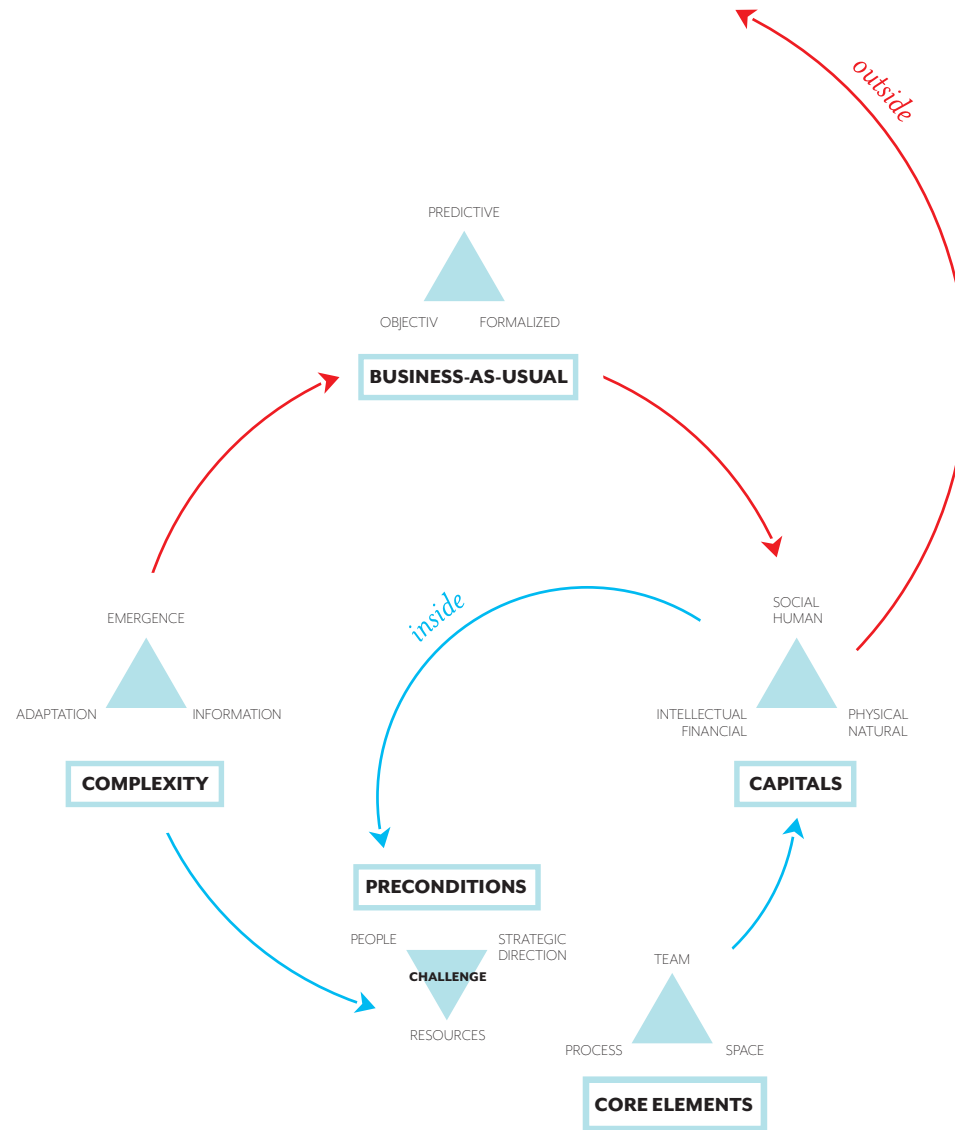
**if the bulk of output goes into private hands  
the “system” doesn’t have sufficient capital to maintain itself  
ie the system is heading into catabolic collapse**



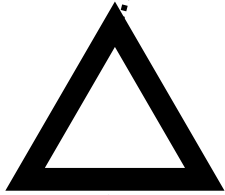
**our goal is to develop “strategies” with built in “re-cycling”  
or “up-cycling” mechanisms**



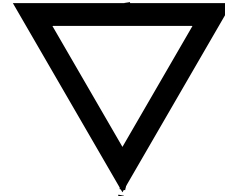
our goal is to develop “strategies” with built in “re-cycling”  
or “up-cycling” mechanisms - **how?**



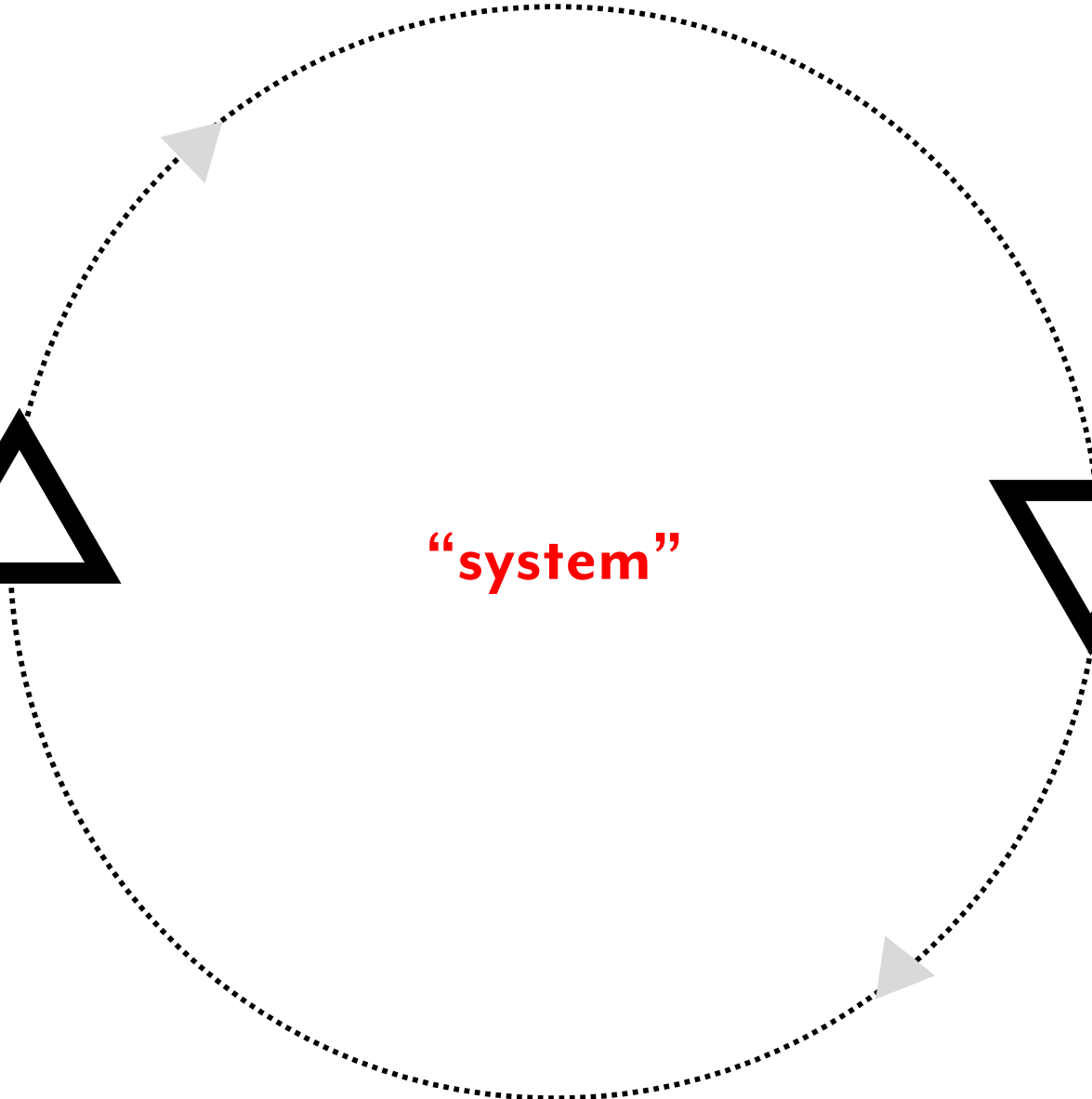
**inputs**



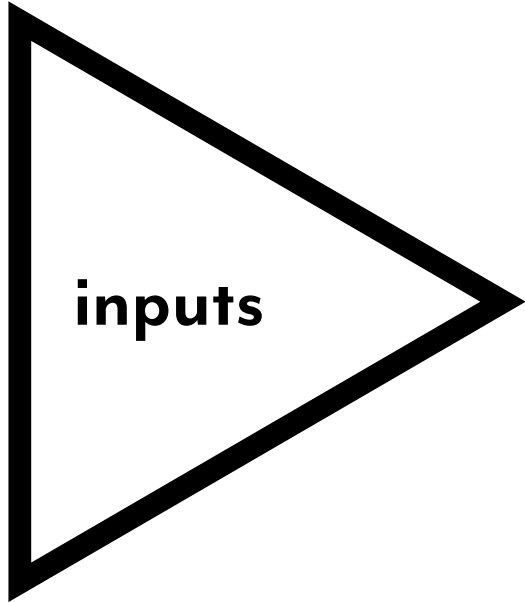
**“system”**



**outputs**



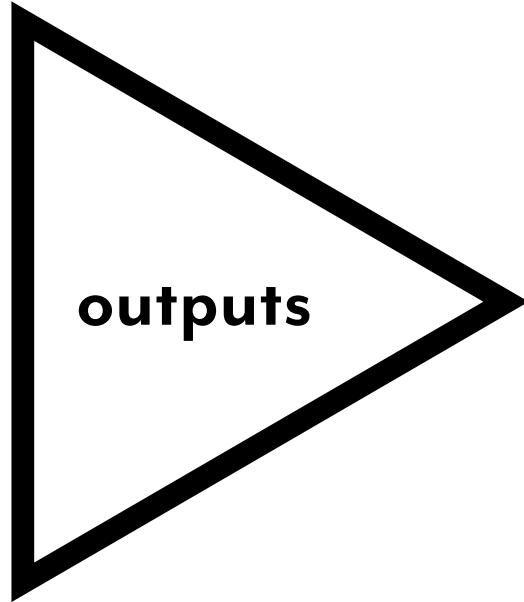




**how much do you need?**

**how do you use it?**

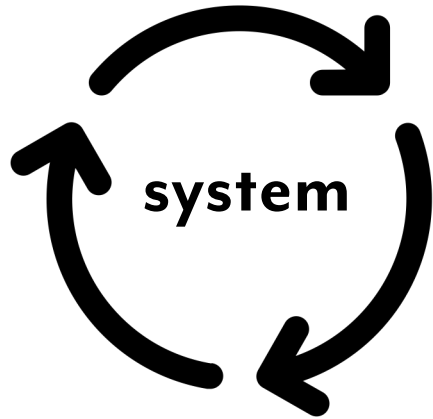
**how do you get it?**



**how much are you creating?**

**how do you share it?**

**who decides?**



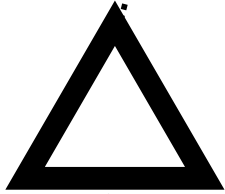
**how much is needed?**

**who benefits ?**

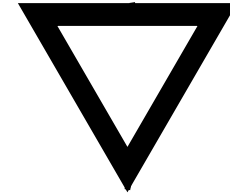
**by what mechanisms?**



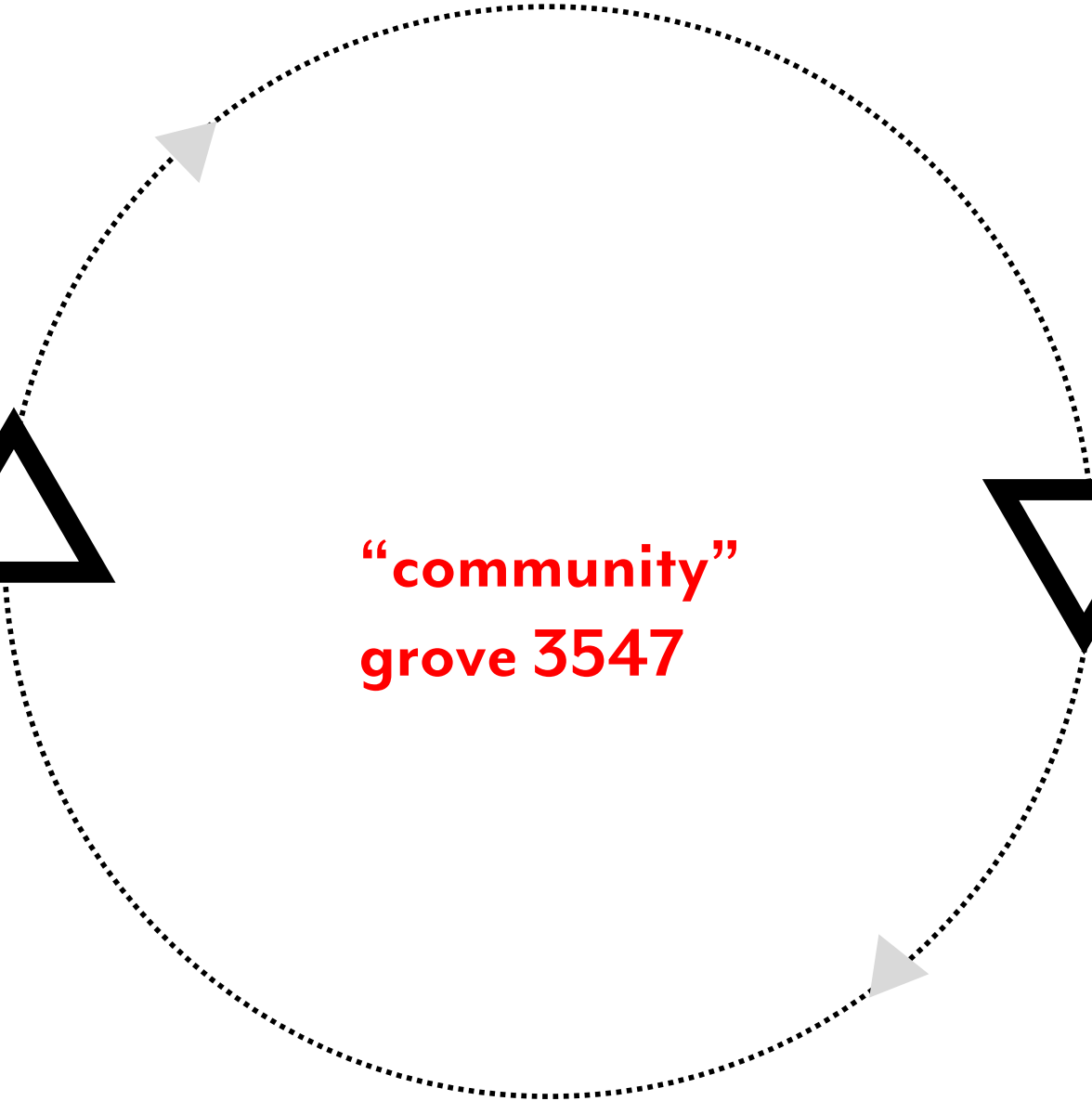
**inputs**



**“community”  
grove 3547**



**outputs**



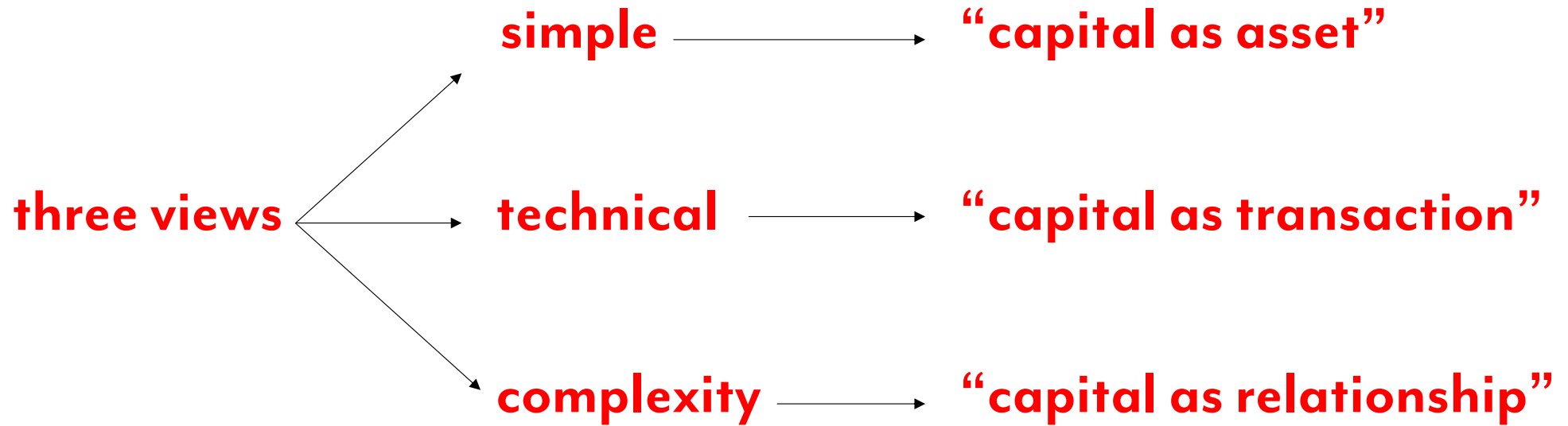


Friday 4 June 2021

Foundation of Complexity 3

# an introduction to multiple capitals

Session 1/2/3



**what are the implications of each view?**



**“capital as asset”**

**what are the implications of each view?**

**power?**

**“capital as transaction”**

**“capital as relationship”**



“

**The individual, with his identity and characteristics, is the product of a relation of power exercised over bodies, multiplicities, movements, desires, forces.**

”

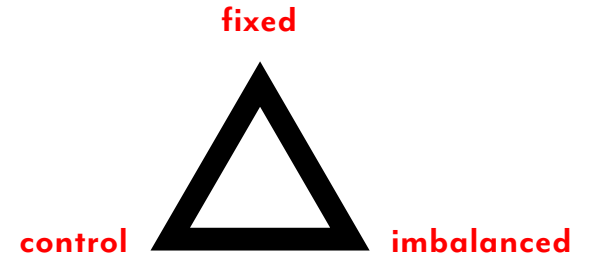
- Michel Foucault





**what is the nature of our relationships  
in a complex system?**

**fixed versus fluid  
imbalanced versus balanced  
control versus reciprocal**

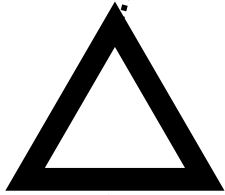




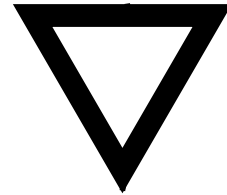
**consider two views – global & practical**



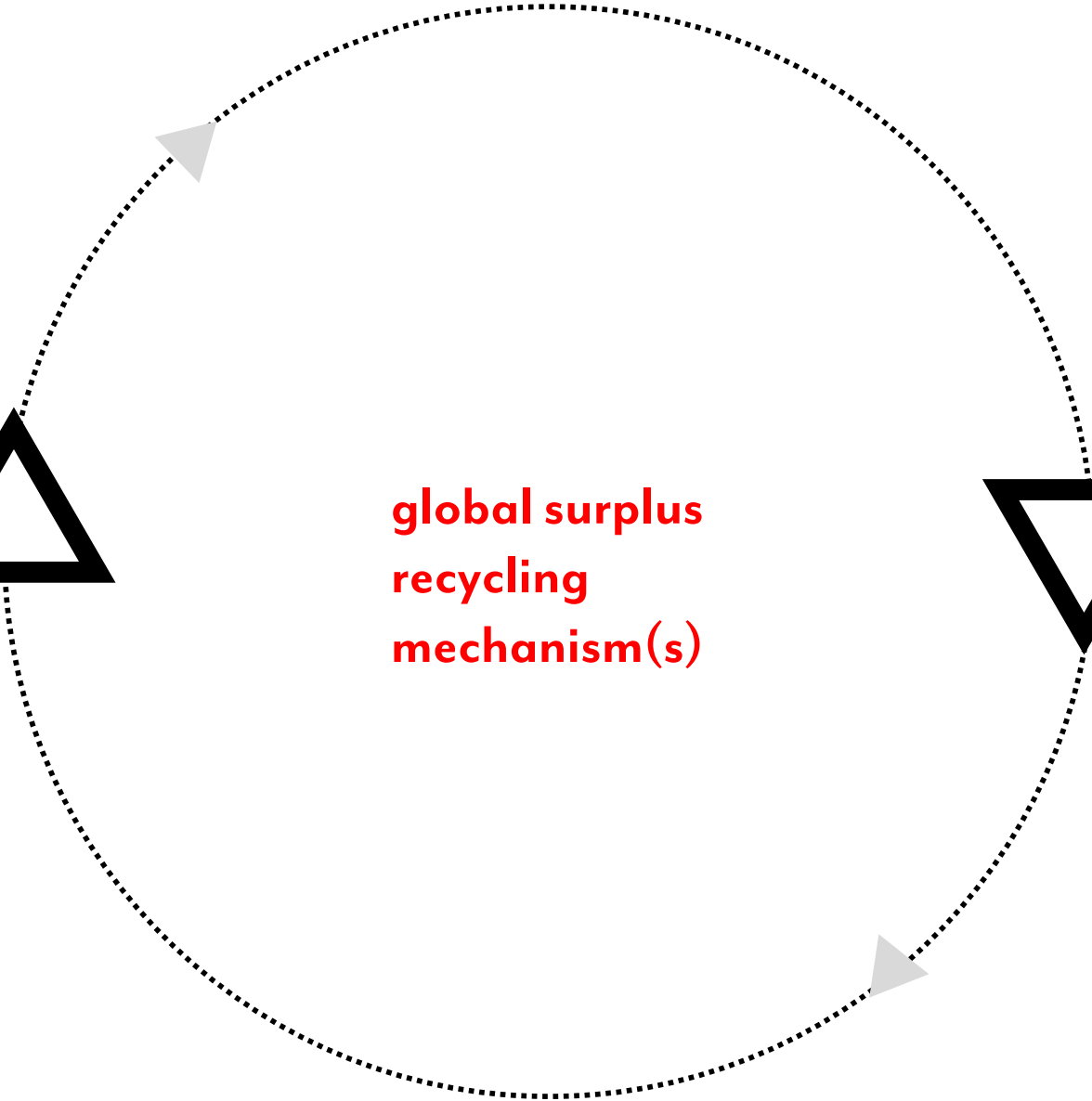
**inputs**



**global surplus  
recycling  
mechanism(s)**

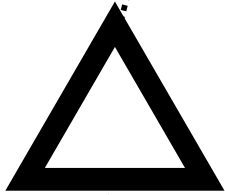


**outputs**



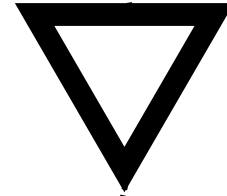


**inputs**

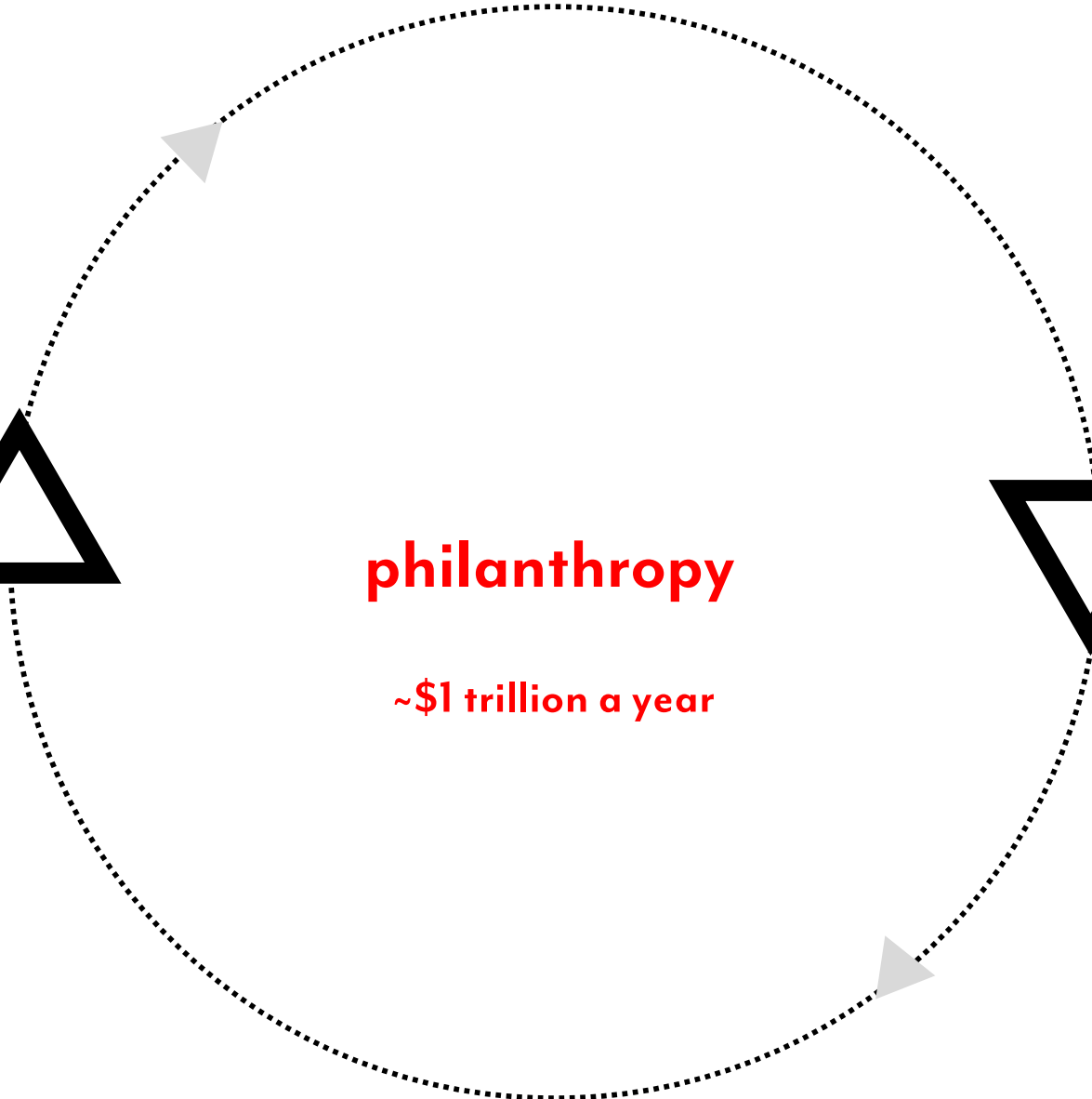


**philanthropy**

**~\$1 trillion a year**

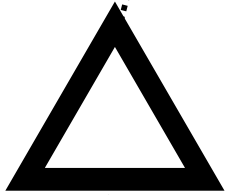


**outputs**



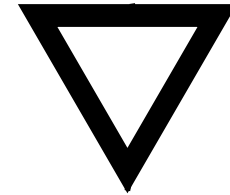


**inputs**

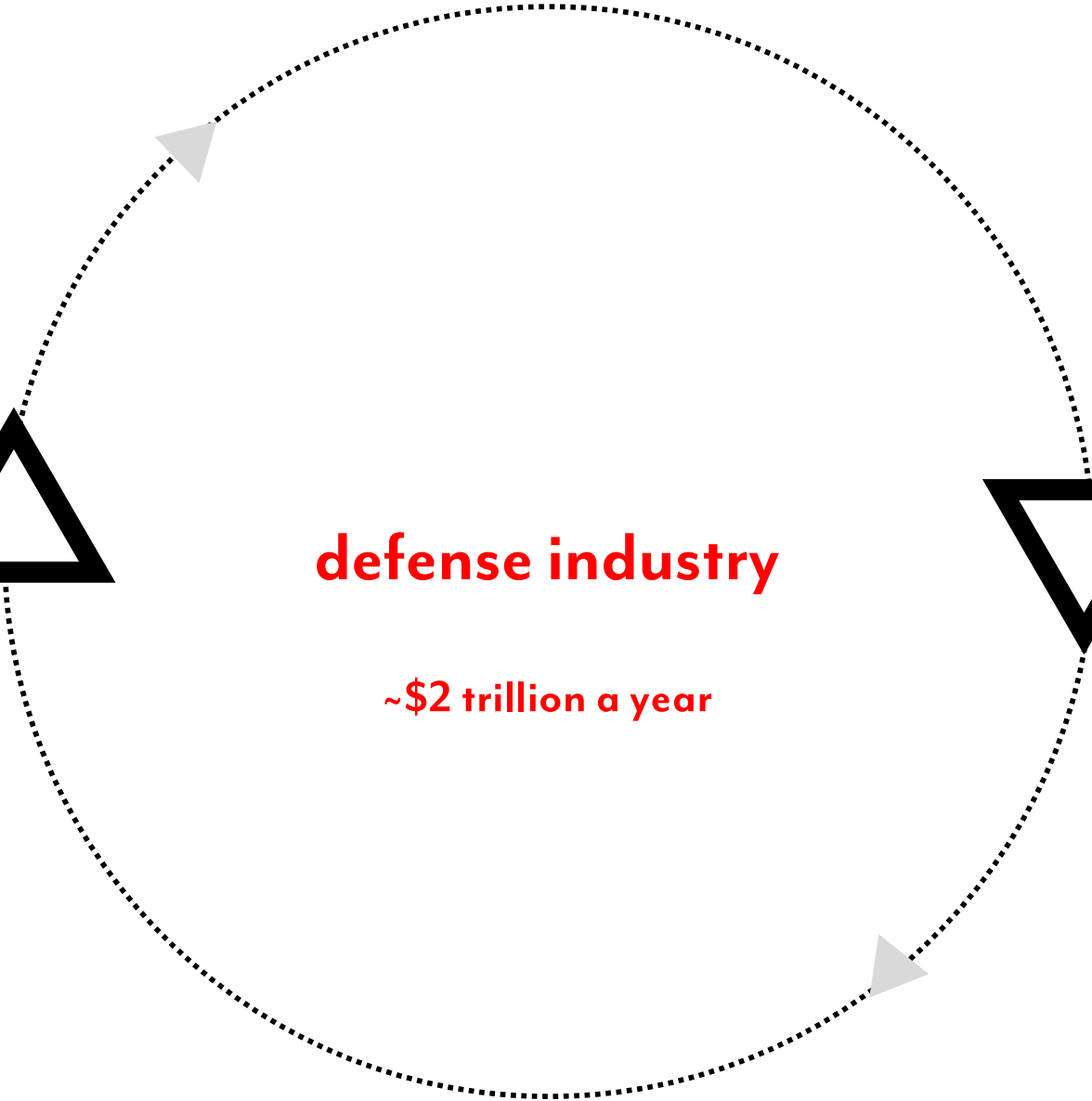


**defense industry**

**~\$2 trillion a year**

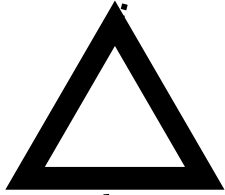


**outputs**



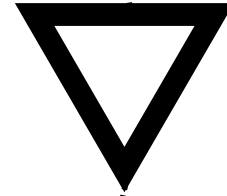


**inputs**

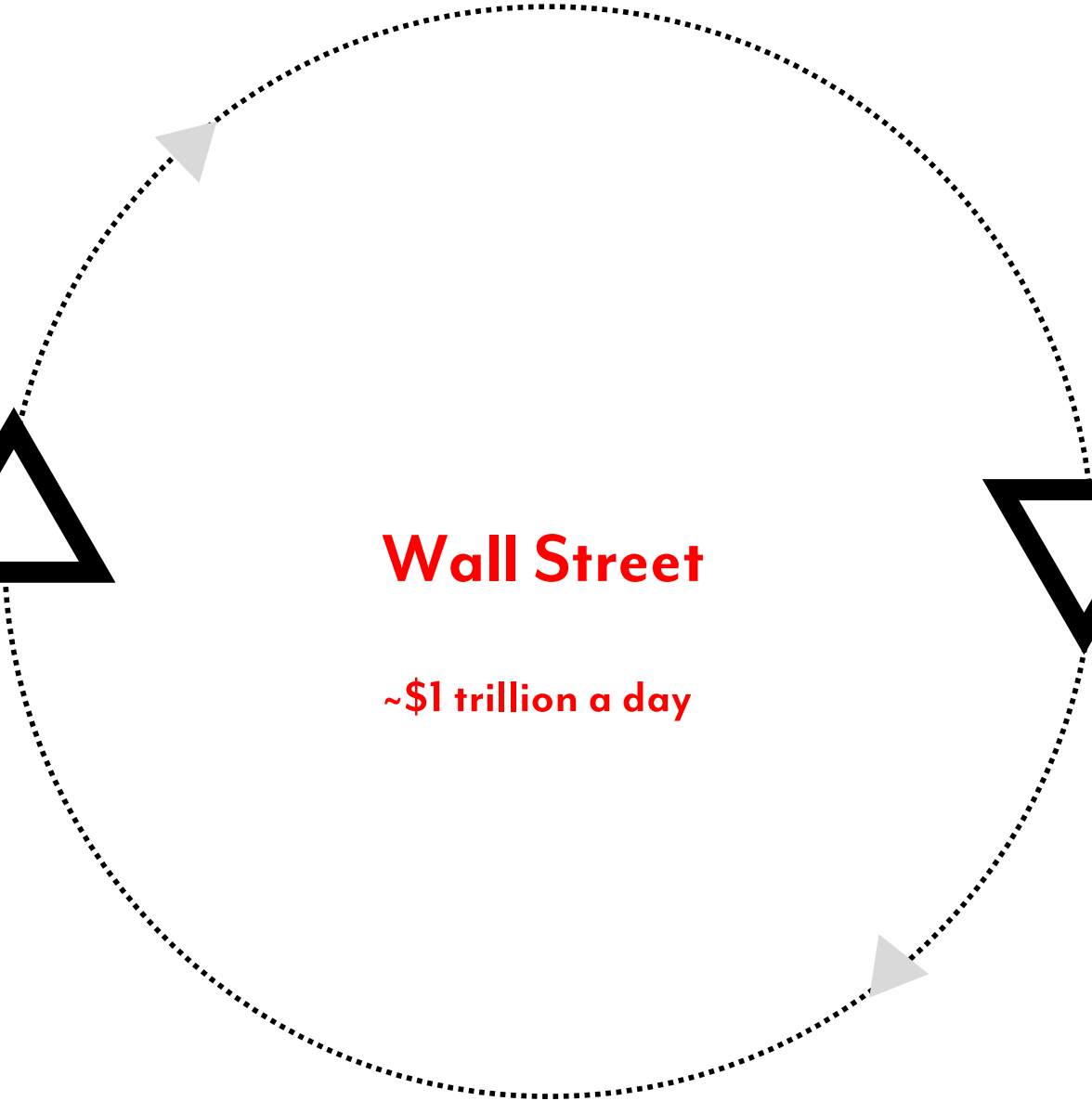


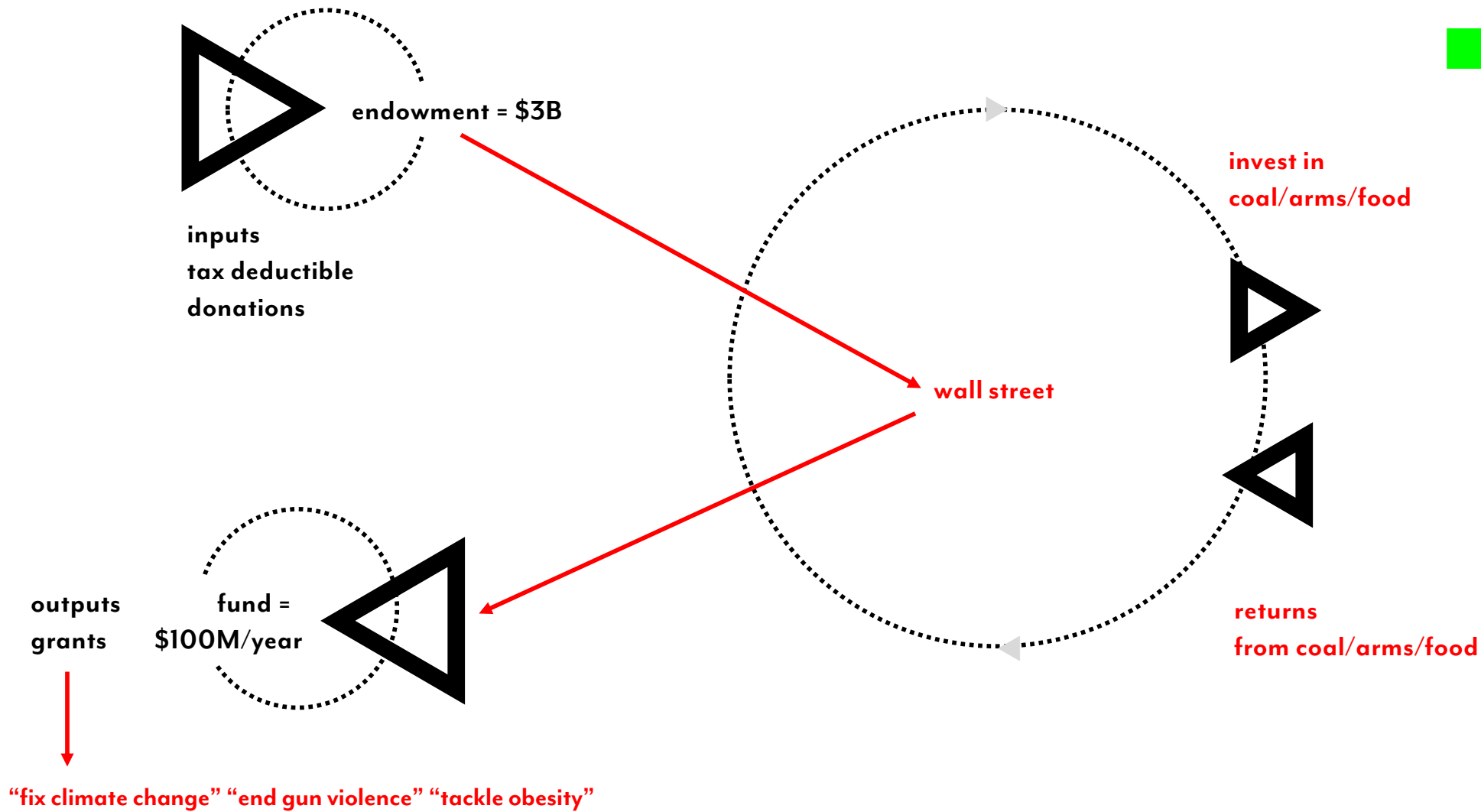
**Wall Street**

**~\$1 trillion a day**



**outputs**







**so what do we practically do?**





**introduce multiple capitals practices (at multiple scales)**



**develop a multiple capitals practice (at multiple scales)**

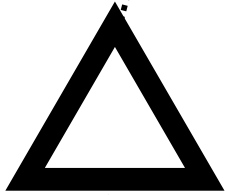


**our goal is to develop “strategies” with built in “re-cycling”  
or “up-cycling” mechanisms**

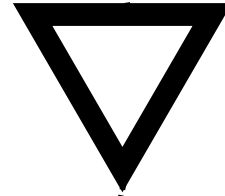


**create your own “recycling mechanisms”**  
**what sort of relationships do you want to cultivate?**

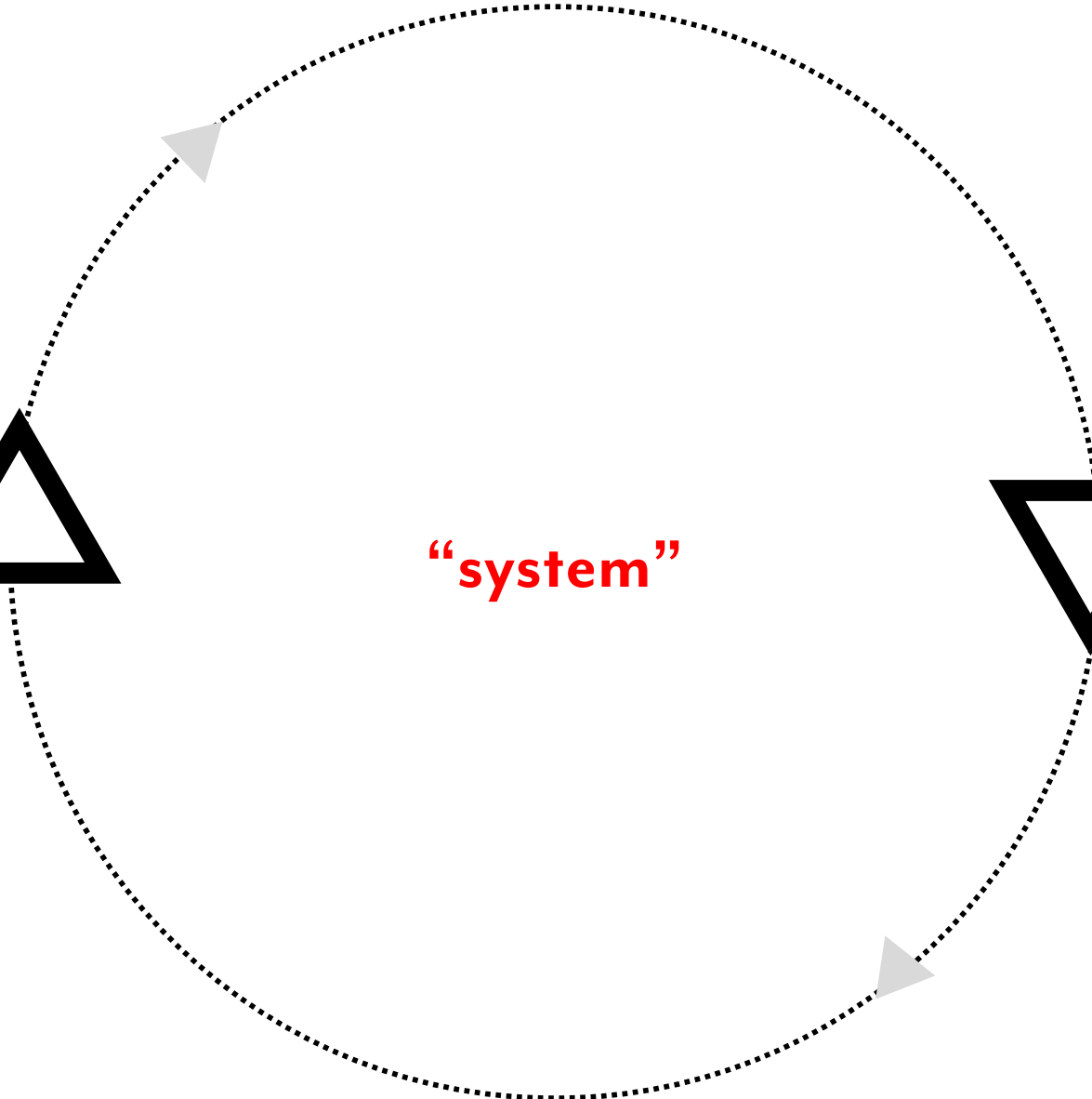
**inputs**



**“system”**



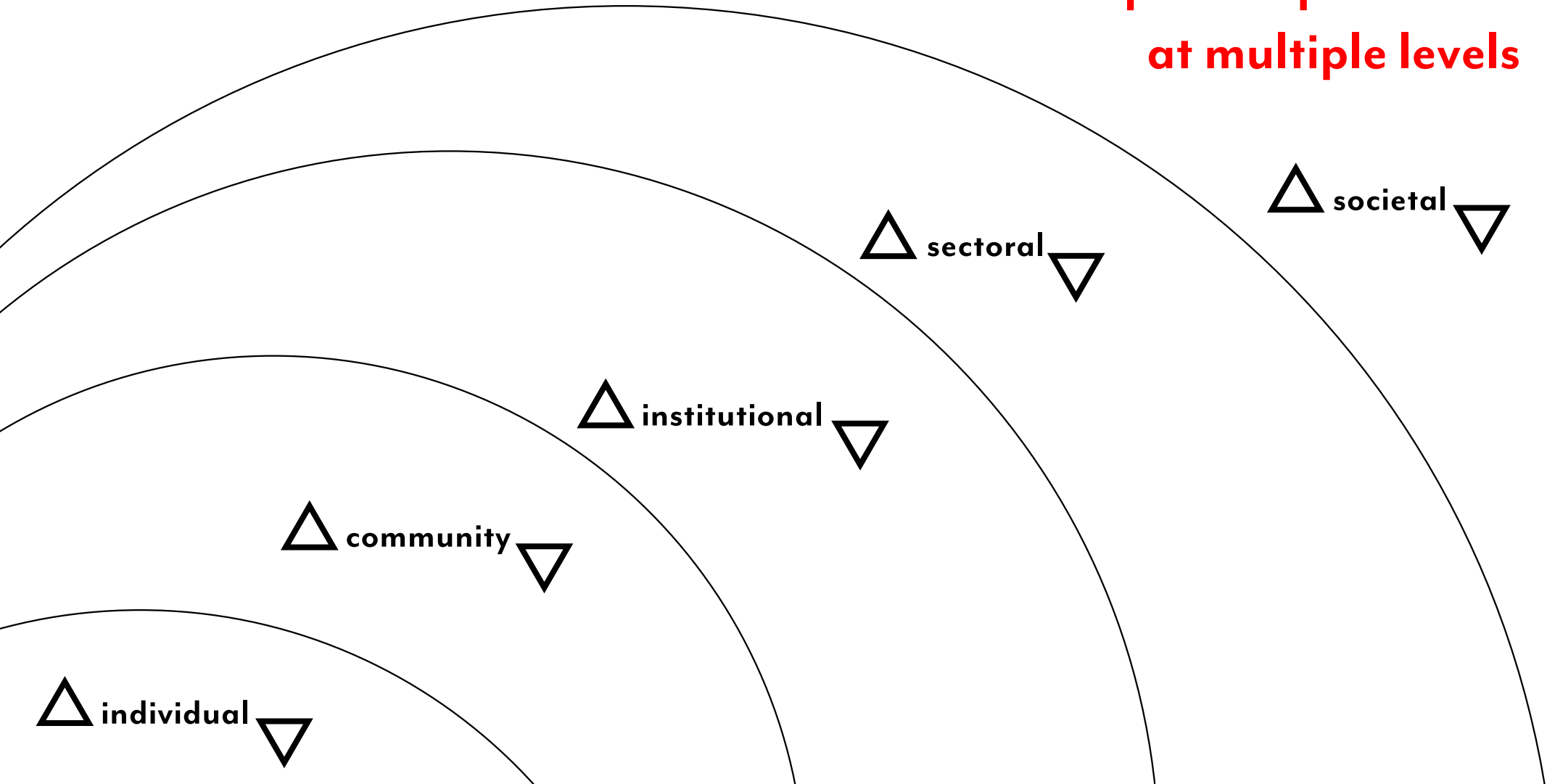
**outputs**



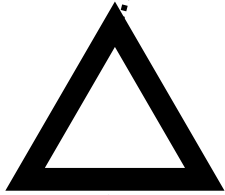


**a complex system can exist at (almost) any scale**

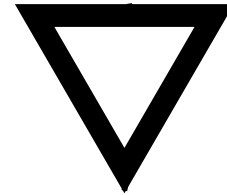
# capital requirements at multiple levels



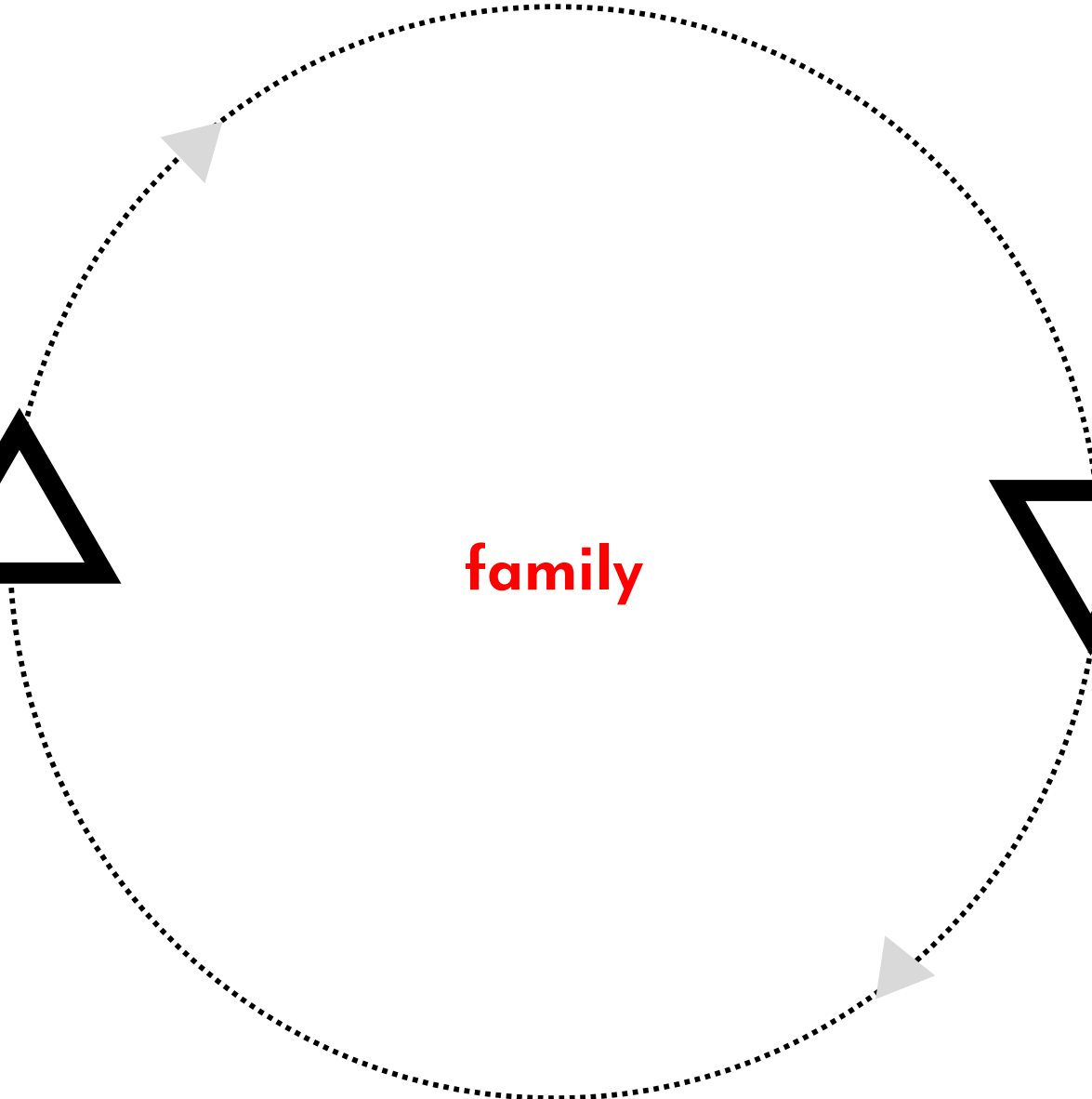
**inputs**



**family**

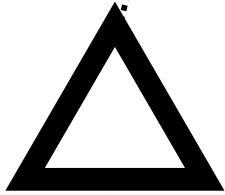


**outputs**

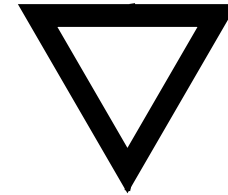




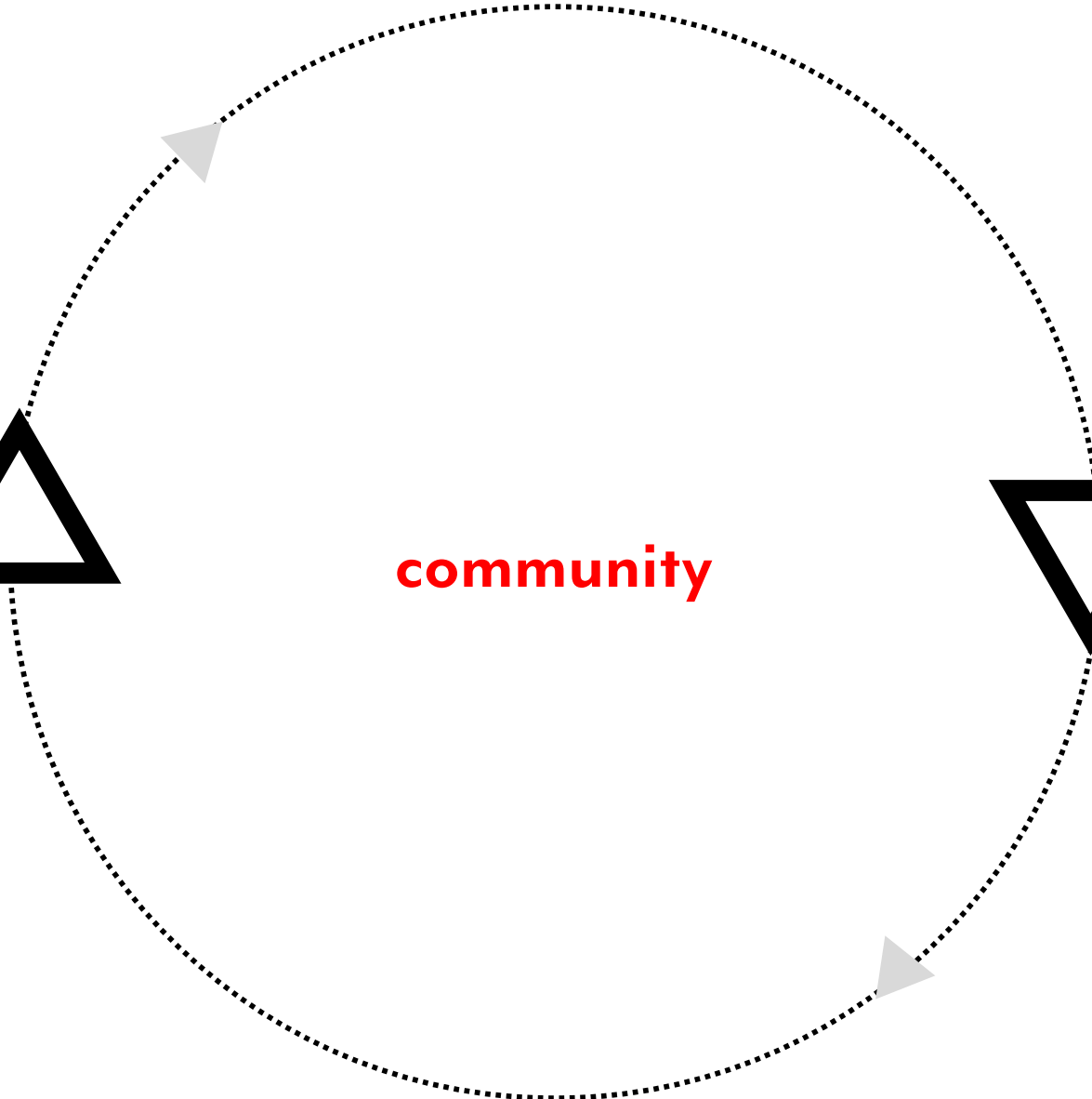
**inputs**



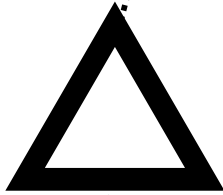
**community**



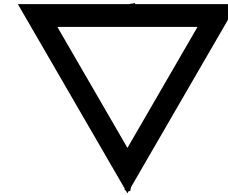
**outputs**



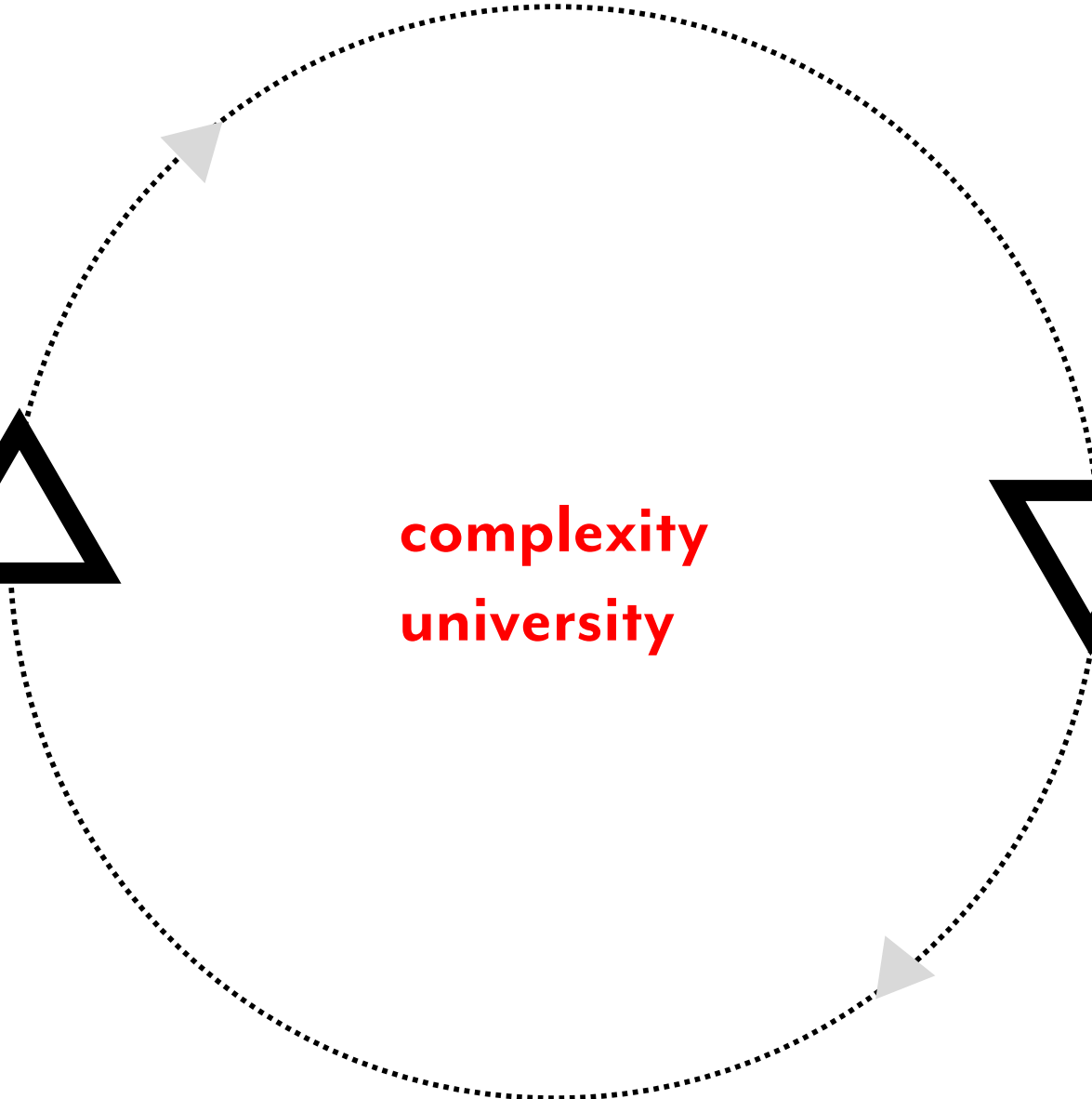
**inputs**



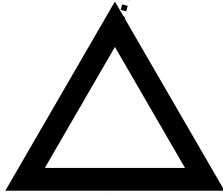
**complexity  
university**



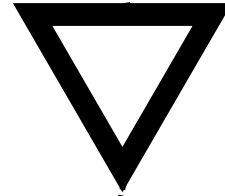
**outputs**



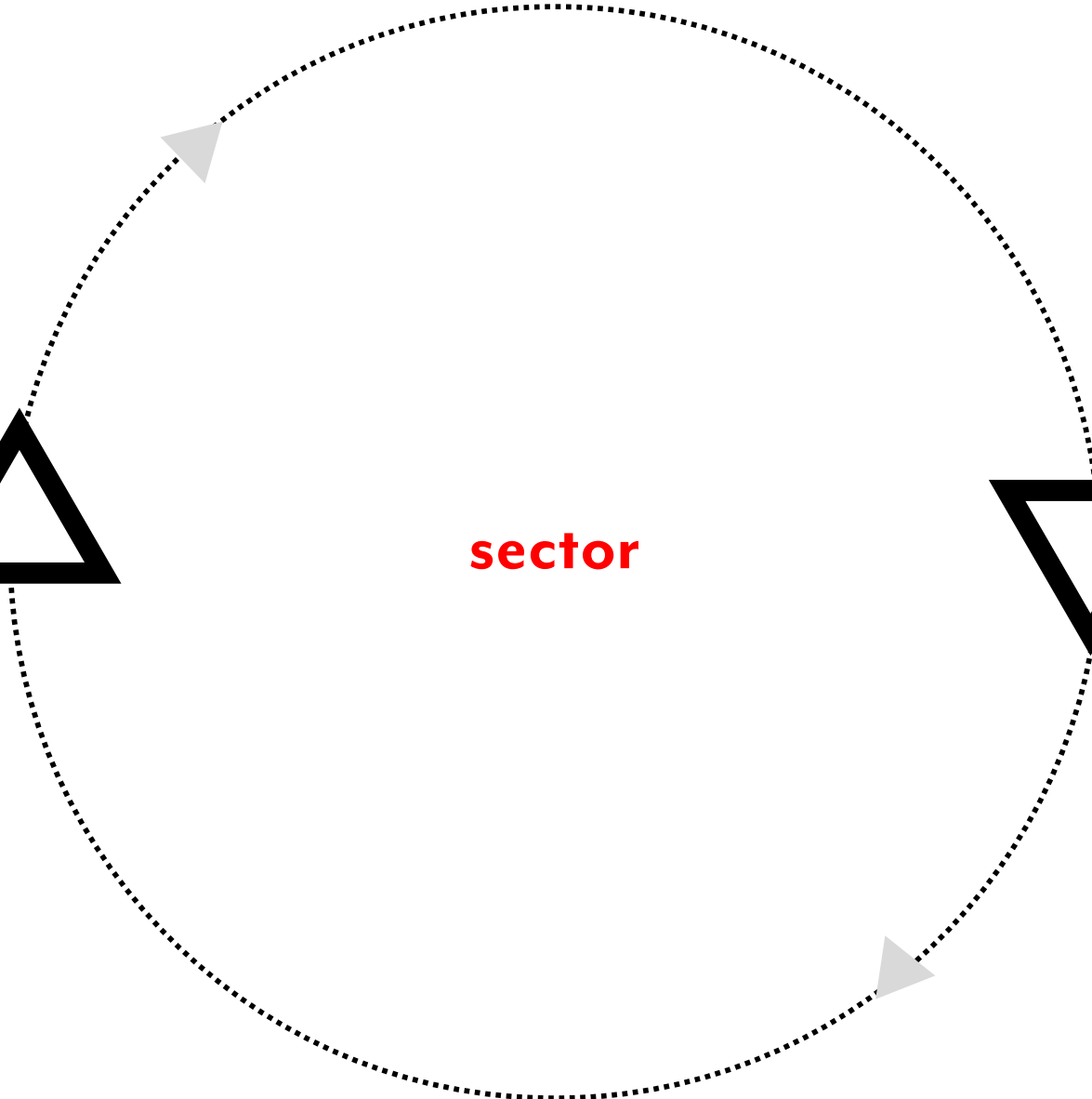
**inputs**



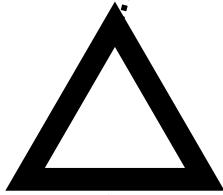
**sector**



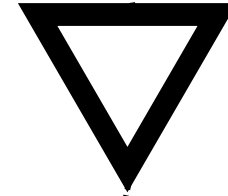
**outputs**



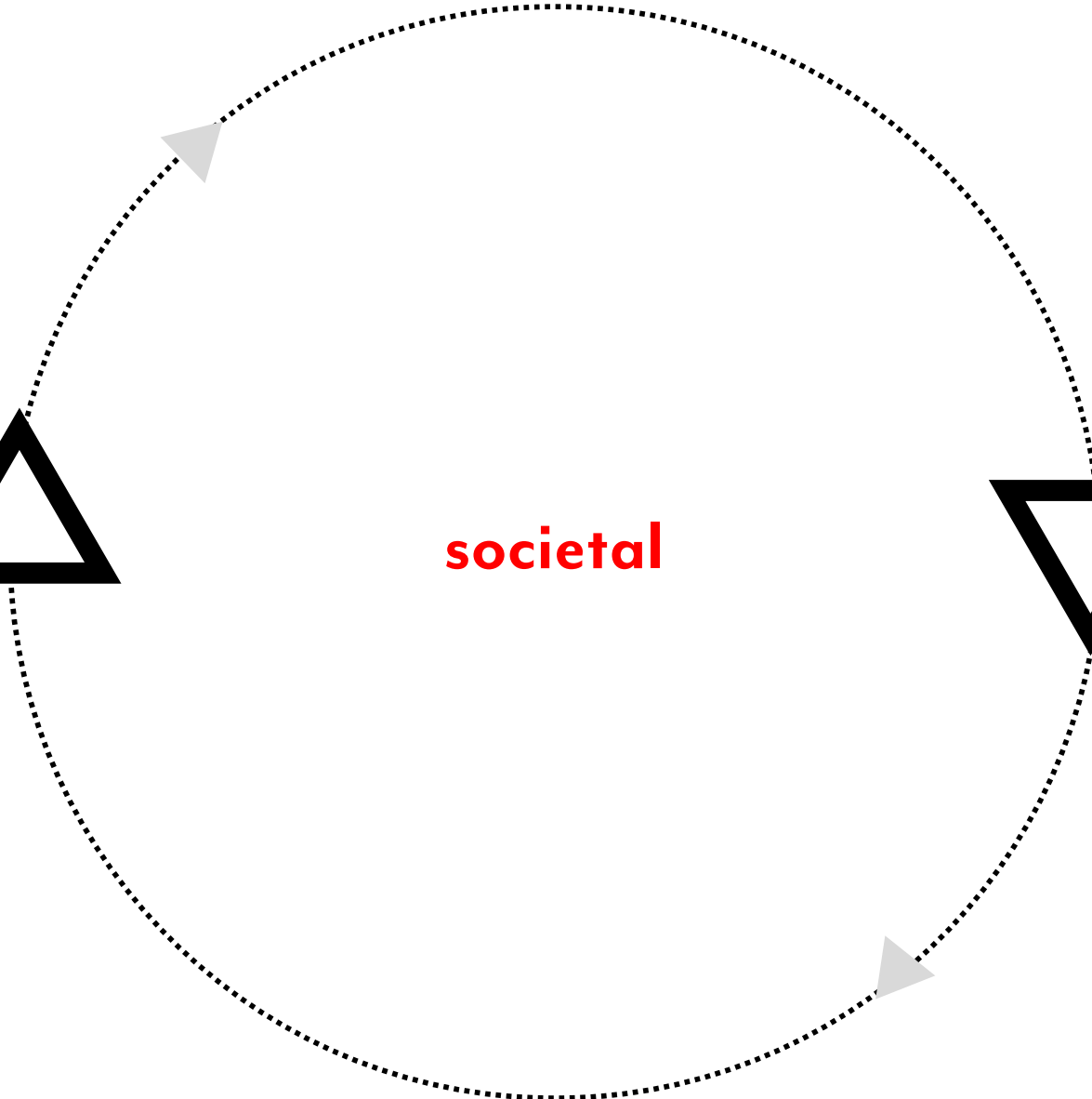
**inputs**



**societal**



**outputs**





**sequencing**

**1**

**system**

**how much is needed?**

**who benefits ?**

**by what mechanisms?**



**sequencing**

**2**

**inputs**

**how much do you need?**

**how do you use it?**

**how do you get it?**



**sequencing**

**3**

**outputs**

**how much are you creating?**

**how do you share it?**

**who decides?**