Open Source Ecology

Factor E Farm in five minutes

Introducing the Global Village Construction Set

Our aim is the full integration of small-scale, adaptable manufacturing with sustainable agriculture to produce the Global Village Construction Set. With the Global Village Construction Set in hand, people will be able to survive and thrive with a high quality of life that is not dependent on global supply chains, human exploitation, and environmental degradation.

landscape shot

Factor E Farm is in Maysville, MO, North of Kansas City

"The best design experiences occur when no one can claim credit for the solution- when the solution grows and evolves organically out a particular situation, process, and pattern of communication."

—Sim Van der Ryn

With your help and the collaboration of open source developers around the world, we will refine existing technologies and techniques into simple, easily replicated, open source designs with closed, zero-waste resource cycles. Our aim is to have the whole Construction Set ready in two years as a completely opens source, self replicating package, so you can build it yourself.

Fabrication

The key to the GVCS is the fabrication lab, where we will be able to cast and machine metal, Print 3D plastic objects, etch circuits, and construct high-quality equipment whose performance is competitive with commercial products, at dramatic cost savings. The fabrication lab will not just be a world-class microfactory churning out almost anything imaginable, it will also be completely self-replicating. Fully trained fabricators will be able to use the tools of the fabrication lab to re-build the entire lab at the cost of materials. Think of this as a mini China on your desktop.

Designing a shop from the ground up to be self replicating is not a radical concept. Self replicating tools may sound fantastic, but it is only in this current stage of industrial capitalism that the tools in a shop are not regularly used to replicate themselves. The oldest and most basic tool in a machine shop is a lathe, which can be used to make all the other tools (as well as itself). The lathe dates back to ancient Egypt, and a journeyman machinist's education has traditionally included the construction of his own machines in the shop of a master craftsman. Only since the late 20th century has this not been the case. If you are lucky enough to know an elderly machinist, ask after his education. Although the fabrication lab will introduce new materials, tools, and techniques, it will be a return to tradition, not a radical departure.

The Global Village Construction Set is not about generating new technologies, it is about refining existing ones, and the fabrication lab is based around existing projects, such as the

Lifetrac

CEB press

Babbington burner

Sawmill?

Multimachine, a combination CNC (computer numerical control) lathe, drill press, and milling machine. For plastic we will have a RepRap, a reproducing rapid prototyping machine that can fabricate plastic parts from CAD drawings. We will add to this a plasma cutting table for large metal, a 300lb per hour metal casting foundry heated by our Babington burner, and a heavy lathe for turning large metal objects. To make thin film plastics for greenhouses, we will create an open source plastic extrusion and glazing machine. With this Fab Lab we can build from scratch, at the cost of materials, the whole lab, and any other technology in the GVCS.

All of these technologies exist, but middlemen, R&D costs, company overhead, proprietary technique, and limited demand drive the cost of equipment way beyond the only necessary costs-materials and labor. Through online collaboration with a global pool of talent we can create easy to follow plans that eliminate all the extra costs.

Our design technique works like this: we look at what we need to do, and the tasks that need to be performed to do it. Then we crib the essential functions off existing machines and combine them when possible into simpler, more easily maintained devices. Instead of design for obsolescence, we design for disassembly and repair.

Right now we the LifeTrac, a combination tractor and skid loader that achieves a 10x reduction in price over commercial equipment because it is designed for lifetime use, not one time sale, and for easy maintenance, not planned obsolescence.

The same design strategy has been applied to a CEB Press, which pumps out high quality compressed earth bricks, and is being applied to a sawmill. Together, these three machines allow the construction of comfortable, well insulated buildings using entirely local materials. And we are well on our way to developing a Solar steam array, a small steam engine, and a biomass burner for easy, flex fuel power generation.

"It is when two differing areas of knowledge are forcefully brought in contatct with one another that... a new science may come into being."
—Victor Papanek

Our quick pace of development is sustained by the strength of online collaboration and open plans. We believe that open source development is dramatically superior to traditional methods, and not just in software. Open Source is already proving itself in commercial computer hardware world with products like the Arduino (MORE) Instead of working in obscurity, our plans receive the

Illustration of wasteful industrial economy (John Lyle)

Illustration of post-industrial economy (John Lyle)

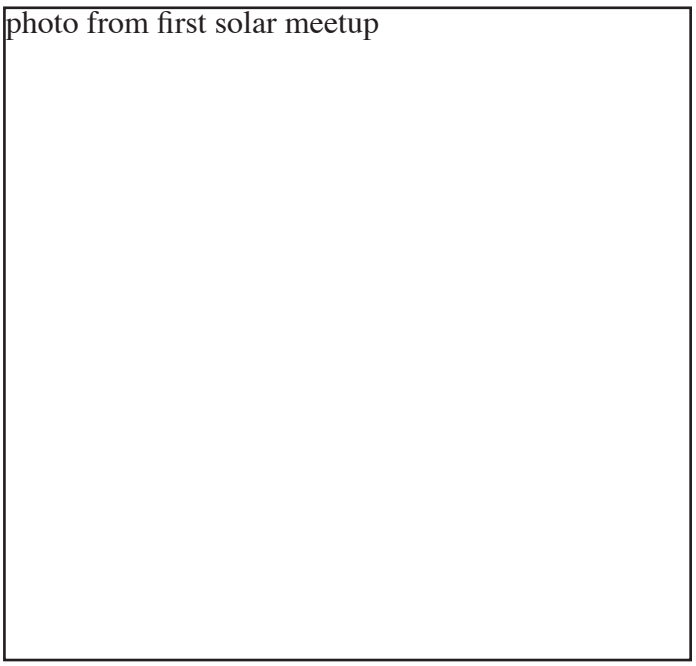
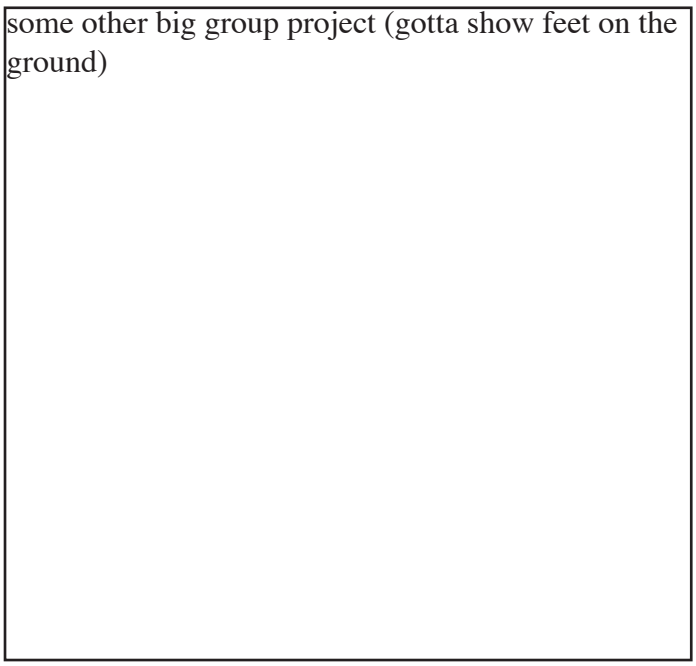


photo from first solar meetup


some other big group project (gotta show feet on the ground)

feedback of experts and interested amateurs as they happen. As a result we make fewer mistakes, and recover quickly from the ones we do make.

But openness is more than just a process for us, we believe in openness as an ideology of transformation. Imagine the knowledge necessary for sustaining advanced civilization available to everyone, not just a limited technical elite. We see open source as a solution to environmental degradation and warfare- an Open Source Ecology integrating computers, communications, energy production, fabrication, and food production will lead to greater self sufficiency and improved quality of life in resilient communities. As our designs come together, we are tooling up for community supported manufacturing, where people collaborate to fund our facility, and we repay them by selling at the cost of materials and labor, linking our users to us and breaking the standard "consumer" and "producer" dichotomy.

This vision inspires us, but you don't need to take our word for it. In the near term, our success will not be measured in our abundance of intangibles such as happiness and self-worth. We are making real products that will compete in the marketplace, and we will capture market share because our products are a good value. Our project is not just a dream, it is a practical plan for an alternative economic model that can and will compete.

"Not seeing the real face of industrial technology is among the factors that make it possible to ignore its presence until its effects become overwhelming."

—John Tillman Lyle

To demonstrate and develop this new system, we are scaling up. On site we expect to have 20-30 people by the end of the year, fed by our farm.

Agriculture

While our methods will be open, our resource cycles will be closed. Organic matter and nutrients will be in complete cycles, enriching our soil rather than mining it. This means integrating wild animals, traditional animal husbandry, perennial crops, tree crops, and raised bed gardening. While documenting our progress, we will also be building a gene bank of regionally appropriate plants, animals, and fungi. We are busy planting a permaculture forest garden, where the trees and bushes produce nuts, berries, tubers, and other edibles, as well as forage for our animals, all in a self-sustaining forest ecology.

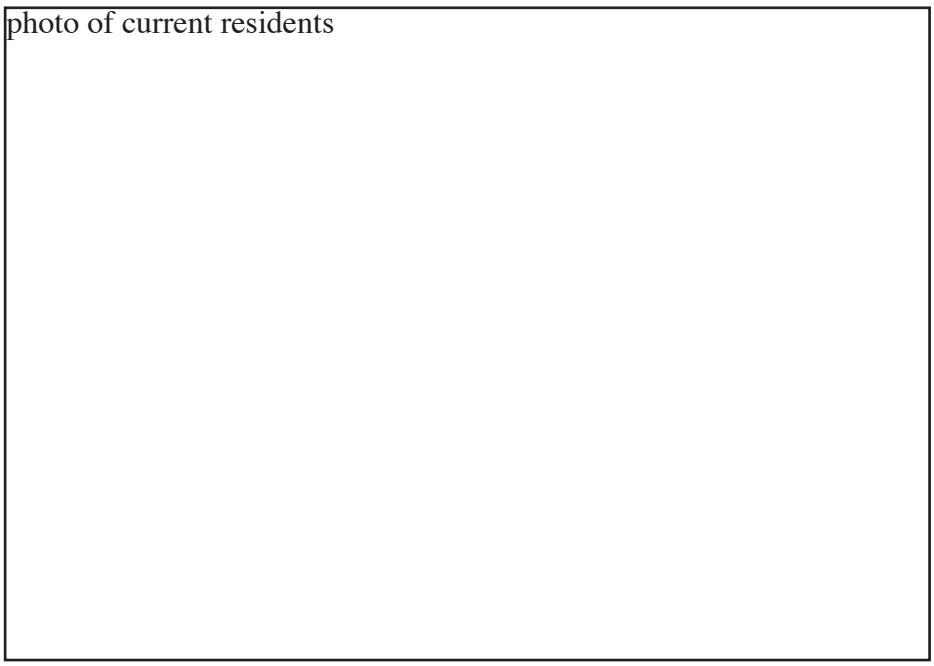
This summer we will conduct a combined agriculture/aquaculture experiment using fish, chickens, and raised vegetable beds in a system designed after the Mexico Basin Chinampa system. Originally created to feed the 250,000 residents of Tenochtitlán (modern day Mexico City) Chinampa is one of the oldest integrative agriculture techniques in the world. Fertile agricultural runoff (in our case from chickens) is directed into ponds, triggering algae blooms that feed fish, whose waste in turn feeds feeds lettuce and other vegetables grown in beds surrounded by water. Waste from the vegetable garden is then fed to worms, who are then fed to chickens. In this way we can

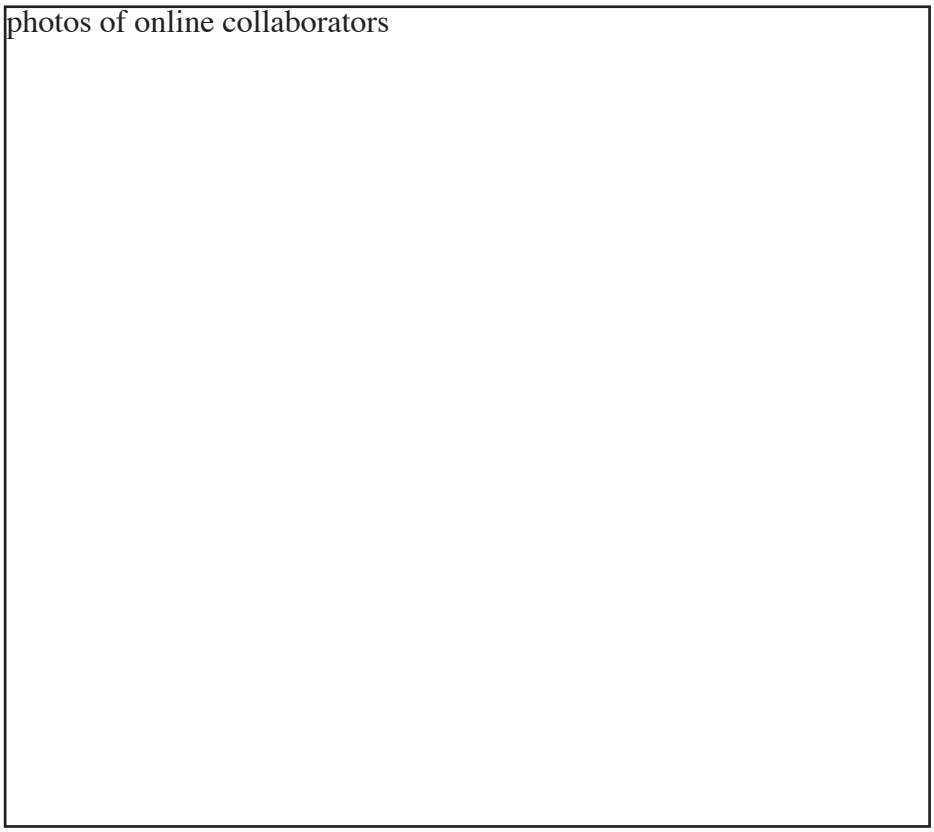
intensively cultivate a protein-rich diet in a small space, enriching the soil while producing food for sale.

When whole systems are put together, their efficiency is astounding. What was once waste is suddenly a resource. Too often in our current economy, we make decisions in isolation of any greater system. The Global Village Construction Set is a fundamental break from atomized thinking. We need not make sacrifices in quality of life to move beyond our destructive industrial system, all we need is full integration, closing resource loops and ending waste. We can make local economies work, but it will take global cooperation. Please join us- review our plans, make comments, become a True Fan, pick some vegetables, or help us build. With all our hands and all our brains, we can re-make the world.

"By attempting merely to improve and modify the familiar ways of designing and building you will succeed only in perpetuating original errors and limitations. So do not be afraid of radical methods."

—R. Buckminster Fuller





How to join/ further reading links

Bibliography