

ECOLOGY AND ECONOMY  
Permaculture as a way of Mind

DECLAN KENNEDY

What do we need in order to plant plants? We need a lot of sun and we need some water, but what's happening now in most agricultural endeavours is that they need the sun and the water but they get it at the wrong time because they've gone away from nature. Take the grain situation. No farmer would think of putting in the grain at the same time he harvested last year's crop, although that is the way nature does it. The grain ripens, and then it falls and seeds itself, but the farmer holds on to it for anything up to six months. Then he has to begin plowing the ground with chemicals to get this going again with irrigation systems and so forth.

In permaculture we try to observe and learn from nature. We try not to turn the soil any more than is necessary. We try to build sun traps (Fig 1) such as gooseberry bushes or fir trees through planting these. Permaculture takes a bit of time before it is established, but agriculture always took a piece of time up to 30 or 40 years ago.

It's been within my lifetime that the whole of agriculture has topsy-turvyed, becoming a mechanical business which has created fantastic systems of doing things in large ways. But that is exactly wrong for nature. Nature has never done anything in large ways. Even the huge, vast, immense acreages of rain-forests are very balanced systems of changing small areas.

If we want to solve the problem of food production in the world we have to get away from large-scale agriculture. We have to get back to some traditional ways, but not forget what we have learned in the meantime. Permaculture looks at old systems, evaluates them and then comes up with new ideas and new systems, aiming to achieve at least the same yield, if not more, with less work than mechanised agriculture.

A very important thing about permaculture - perhaps one reason why it appeals to me as an Irishman - is the principle of doing less work. It's so simple to have your parsley right beside the kitchen door because you use parsley or other herbs anything up to three times a day (Fig. 2). But who does it? There are gorgeous herb gardens here in Findhorn but the people in Cluny have a long way to go to get to the herb garden. We have set ideas - the flowers have to be in the front garden and the dirty vegetables at the back.

Here is the situation on the global level today (Fig 3 top). This is the production of food today in big centralised linear systems. We have monocultures beside each other - grain, vegetables, fruit, forests, different types of animals, all

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(cont.)

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Dortmund August 1988

UNIVERSITY DISTRICT  
PLANNING AREA,  
DORTMUND, WEST GERMANY

ENVIRONMENTAL PARK

PLAN 23  
SUN TRAPS

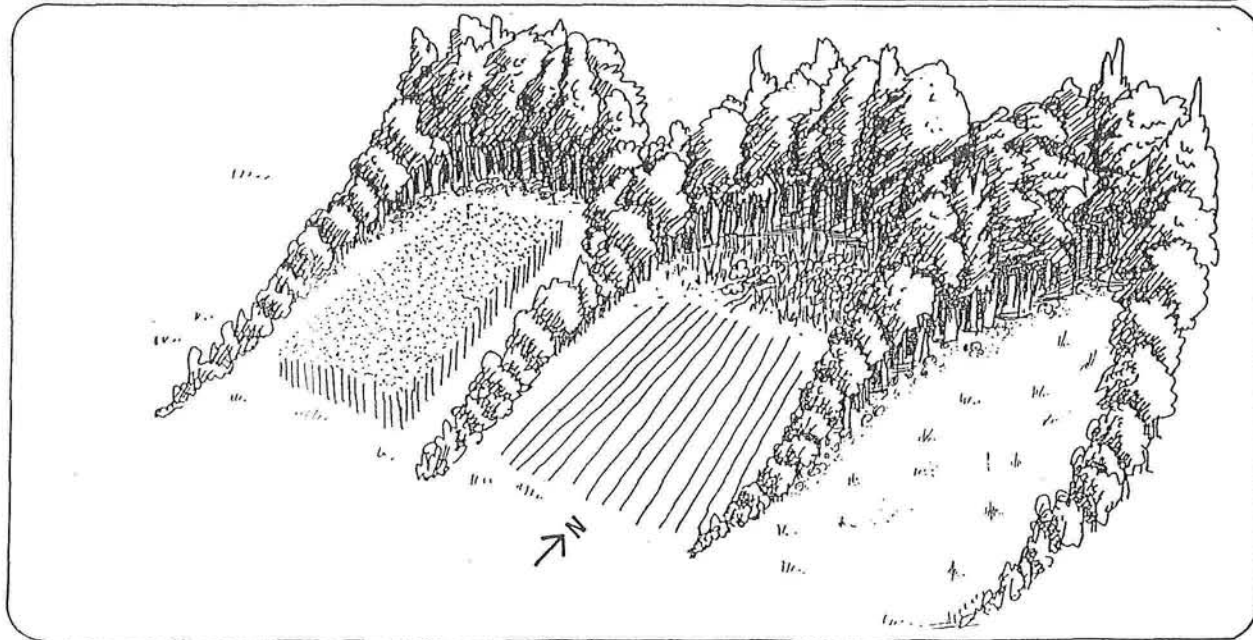
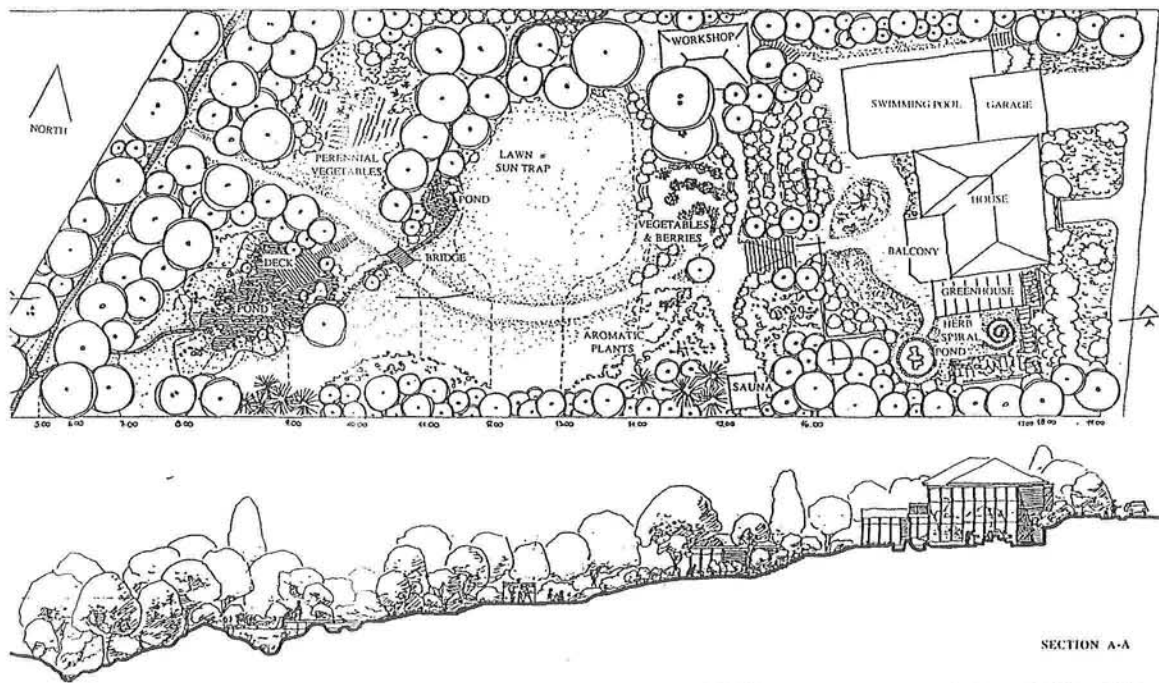


Figure 1



PERMACULTURE  
DESIGN  
FOR A GARDEN  
ca. 2000 sqm.  
in ESCHERODE  
near KASSEL,  
WEST GERMANY  
SEPTEMBER 1987

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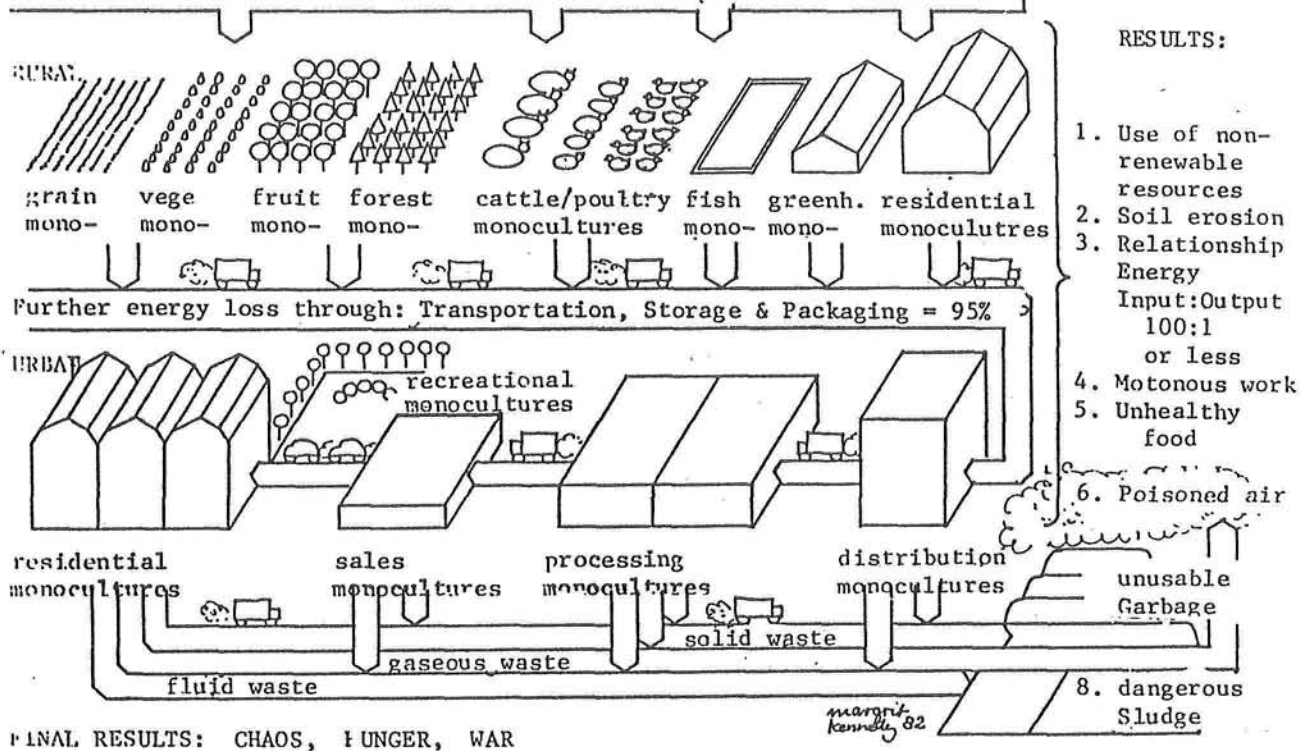
Figure 2

# DECLAN KENNEDY (cont.)

## PRODUCTION OF FOOD - TO-DAY: LARGE-SCALE, CENTRALIZED, LINEAR SYSTEMS

ALL MATERIALS & ENERGY MAINLY COMING FROM THIRD WORLD COUNTRIES:

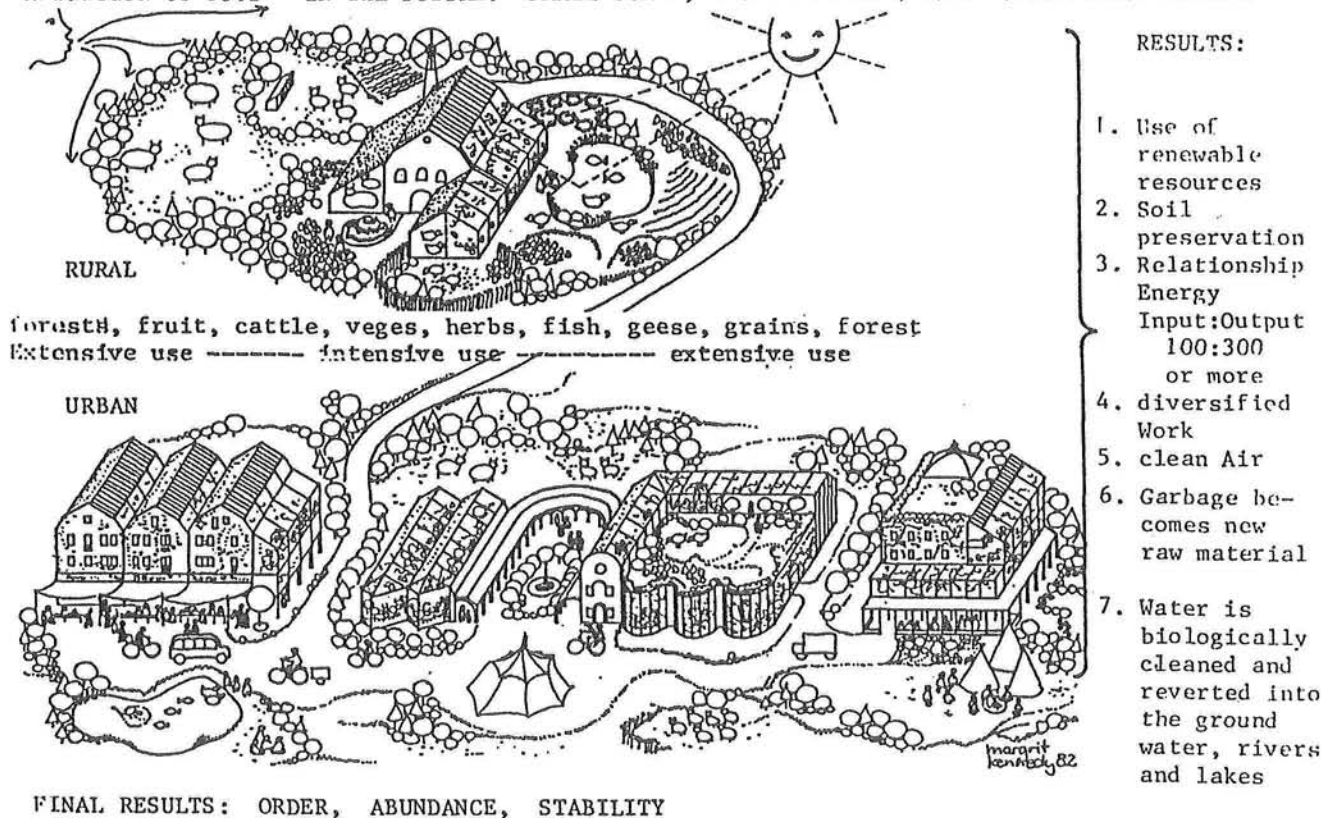
Artificial fertilizers, biocides Fodder Transportation Elect. & Oil



### RESULTS:

1. Use of non-renewable resources
2. Soil erosion
3. Relationship Energy Input:Output 100:1 or less
4. Monotonous work
5. Unhealthy food
6. Poisoned air
8. dangerous Sludge

## PRODUCTION OF FOOD - IN THE FUTURE: SMALL SCALE, DECENTRALIZED, MULTI-FUNCTIONAL SYSTEMS



### RESULTS:

1. Use of renewable resources
2. Soil preservation
3. Relationship Energy Input:Output 100:300 or more
4. diversified Work
5. clean Air
6. Garbage becomes new raw material
7. Water is biologically cleaned and reverted into the ground water, rivers and lakes

Figure 3



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separate from each other, poultry, fish, glasshouses. You also have monocultures of living called housing estates. Then you need transport between all these.

My daughter was hitchhiking from Berlin to Bremen one day and she got into a lorry. She asked him what he was bringing to Bremen. He said he brought sausages from Berlin to Bremen. And what did he bring to Berlin? He said, sausages. Ninety-five percent of energy that goes into putting a piece of food on your table goes into transport, storage and packaging. Five percent actually goes into producing that food. That is what we call economics. So it goes into the city and through distribution and manufacturing. We put food through many manufacturing systems, which erodes its nutritional value at every stage. Then we have to go to the supermarket and buy it. We also have monocultures in our cities where we recreate our parks, and again we have monocultures of living.

In point of fact we have another monoculture that I haven't mentioned, and that's the hospital monoculture, the result of all this. And we have all our different disposal systems - the water disposal system getting rid of our shit, the gas disposal system, all the pollution we put into the air, and then the disposal system of all our garbage, and we end up with a big lump of garbage. Of course, that is our problem with the environment. So no one should say it's those nasty Russians with Chernobyl. They are Chernobyl, everybody is Chernobyl. In point of fact, everybody is responsible for this because we accept it and because we work within it. You can't point the finger at anybody.

I went through the whole thing in 1968 with the students in Berlin, and that was pretty hard going. There was all this finger pointing at the bad guys, but in fact, nobody was looking at themselves. But I think that is one thing we have learned through our spiritual attitude in the last couple of years.

The end result will be chaos and hunger. As Margrit (Kennedy) said, no continent is more threatened with hunger than Europe. If the oil doesn't come to Europe any more, we are in trouble because we use it in our pesticides, our herbicides and our fertilizers. If something happened to the oil and the British and the German populations were to go hungry, do you think that Maggie Thatcher or Helmut Kohl would sit down and talk and not go to war? In point of fact, economics is the reason for war. Where are the wars at the moment? Where were the last wars that we had? They all had something to do with oil, if you think about it.

Let's look at the good news in permaculture. In Fig. 3 (bottom) we have the same elements. We have the greenhouse attached to the house so, it's a heat gain. We have the water in front of the house so we get the reflection of the sun in the winter, accelerating the gain of the warmth within the greenhouse. Usually, in northern European countries we have to heat more in the winter than we actually need because we lose a lot of heat. If we insulate and have the greenhouse as a buffer zone, we can have chickens. Chickens have an enormous amount of heat and they don't know what to do with it, so they go running around outside.

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If you put them into a greenhouse, they will heat the greenhouse. This has been done in Germany, in Hertz, where the temperature goes down to 20 or 25 degrees below zero. They can start their lettuces on the second day of Christmas because there's enough heat in the soil. Close to the house are the things that need intensive care, and further away the things that don't need intensive care. We work as much as we can with renewable resources, the sun, the wind, etc.

The whole idea is to use all the ideas of ecology and to use them synergistically. In a synthesis of energy, each supports the others so that the whole is more than the sum of its parts; and of course, we use energy systems that are plentiful - like the sun.

We have also transposed these concepts to an urban area. It is possible to produce within urban areas. To make a long story short, we have a small decentralised, multifunctional system where resources are renewed, erosion is cut down if not cut out completely, and instead of getting an input-to-output ratio of a hundred to one, we are getting a hundred to three hundred. That is a conservative guess on both sides.

You would get an altogether different attitude to work also. We have a work system which is multifaceted and interesting. Modern agricultural work is, at the moment, terrifically boring - driving back and forth in a tractor, always in the same direction.

We get better nutrition, and we use our garbage - all our waste - in composting and other things. We stop using the chemicals which are killing our land and covering some land with concrete and turning other land into lakes of water where you can't get rid of the water. All the farmers that I talk to say this will be a huge problem within the next couple of years. If we do things in small areas we get an immense amount of surplus, and in doing that we get stability. So by cutting down the size and cutting down the work, we can get greater benefits.

To give you a couple of examples, I'm going to go over some ideas that we have planned or are implementing or that other people have planned or implemented.

A common misconception is energy saving by putting a glass façade in front of an old façade. You do save energy, but only just, and you don't do anything else. If you take glass and put it two-and-a-half meters out, you have a producing area in the winter and you have extra space for sitting. This could be great help in our northern European climates. Many people have greenhouses but not always making them into productive greenhouses right beside the kitchen door or the living room.

Sonia Walman built about a hundred greenhouses in the New Hampshire area, and we have estimated that they would give about fifteen percent self-sufficiency for a family of three in winter in the Berlin area with a greenhouse of about two and a half meters by eight. Two-and-a-half meters by eight is nothing - it's about the size of a normal balcony.

An example from Sweden is the Naturhuset. It's a normal house, built by an

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architect with the storage system underneath. He left off the roof and put in the glass wrap-around system. The glass walls are placed so that four different climate zones are created - a Mediterranean climate here - perhaps a northern Alps climate there. He can grow figs to northern Swedish vegetables all the year round. It's just outside Stockholm and has all sorts of energy saving devices. The only external energy comes from one stove, otherwise there is a whole system of reflection from the roof. There is a composting toilet where he recycles all the kitchen waste and all the normal things that go into a toilet.

An example from Berlin is an old parking garage which had a children's playing lot on top. There were so many muggings and things that happened in this parking garage that nobody wanted to use it and it was decided that it should be pulled down. It was then argued that if it was pulled down the natural resources that had been built there would be lost plus it would cost money to pull it down. For the same money or little more, you could put up a kindergarten with an aviary in the middle, with grey water being pumped up by a windmill - by grey water I mean the water from hand basins and baths - to be cleaned in a treatment plant up on the roof and run into a little fishpond with all sorts of producing plants. Also there would be greenhouses in the areas where the sun comes in, which helps reduce the heating costs. This design was not implemented exactly like this. The government and the provisional authorities were not ready for that sort of thing.

In Berlin there is a Women's District Centre on which Margrit worked for a while with a greenhouse on the roof, created by taking the tiles off the roof and putting a glass there instead. There was also a new facade of producing balconies, and a four storey humus toilet in it going all the way down the middle.

There was a second greenhouse over in one part of the building which was a creative workshop for the women, and there were living areas and an area for social services. It was a project where the people who used it did it themselves, and is more or less going at the moment. It's finished but the running of it is difficult because people haven't got used to taking time for things ecological.

The Centre for Alternative Technology in Machyllnyth in Wales has an example of a balcony three meters by three meters showing how you could be about 40 percent self-sufficient in an urban area.

A concept which is almost ten years old now was done by a group in Berlin with inhabitants of an apartment block. One of the people living in the block drew up this idea of covering all the roofs in grass and in production with sheep on the roof, with fish tanks and open areas for cafes and greenhouses, and having the greenhouses down the facade so that each apartment could produce. The plan was supported by the Ministry of Agriculture for a dense area of West Berlin, which was a terrific breakthrough, but there was not enough money to carry it through, so only bits and pieces have been done.

As Hazel Henderson said earlier, we have the technologies to do this and there is no reason why we shouldn't. There is no logical reason, but if you can get



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18 or 12 or 8 percent just turning money around by lending it and getting it back and getting the interest and an ecological project only brings two or four percent, you would be a damned fool to put money into ecology. And that is what is happening. The other point is that, every one-off project like the first car that's built in a series, costs millions, whereas the next 20 thousand cost so little that most people can buy them. It's the same thing with an experiment like this. The first experiment in this sort of thing, whether it's urban or rural, costs a hell of a lot because everything about it is new.

We have seen in Steyerberg on our piece of ground that putting down mulch isn't a thing you can just do. You have to learn how to do it. You have to learn in which way you put down mulch. How does it work? Do the wildflowers come through again where you don't want them, and how do you manage to keep nature going within your cultivated area? So it's a terrifically long process of trial and error until you learn.

We did a design for a park near the Dortmund University. In Dortmund they thought they were going to have 25-35,000 students and it stopped at about eight thousand. So they have all this land around the university where we did trial planning for three different pieces of land.

There were ten hectares - a 25-acre piece of land. Three new buildings are planned to be somewhat similar to the old buildings in the village nearby. There would be the first zone of an intensive vegetable system, and then there would be grain and a whole agriculture system going through. There would be the fifth zone of wild forest where animals could be uninterrupted, and the rest, where the paths are, would be an open park. The area where people live would be closed off at night, so that they could have some privacy. There would also be an educational centre which would be as near as possible to a zero-energy house. Plant water treatment would be located where the water enters the little river, which is already very polluted.

Fig. 4 is roughly how it could look in reality; a very difficult thing to draw - to try show this polyculture in it because the polyculture goes all the way through this system of permaculture. We have gone to this planning stage and the Dortmund people have started a society to take it on and implement it themselves. The government of the city is behind it in that they are ready to give this piece of land either free or for a nominal rent and to commit themselves for 25 years. And, they get a park, which is something we don't have much anymore. Maybe in Britain big agricultural business has not gone so far, but certainly the big agricultural landscape is no longer a recreational landscape. It's a boring landscape. It's also not a recreational landscape because it's half polluted with all the chemicals that are being put on the soil and sprayed around. The city of Dortmund is interested because of the recreational value that would come out of this very intense, very interesting place. You can sit down in areas within the landscape.

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UNIVERSITY DISTRICT PLANNING AREA  
DORTMUND, WEST GERMANY

ENVIRONMENTAL PARK  
OVERALL VIEW FROM SOUTH WEST

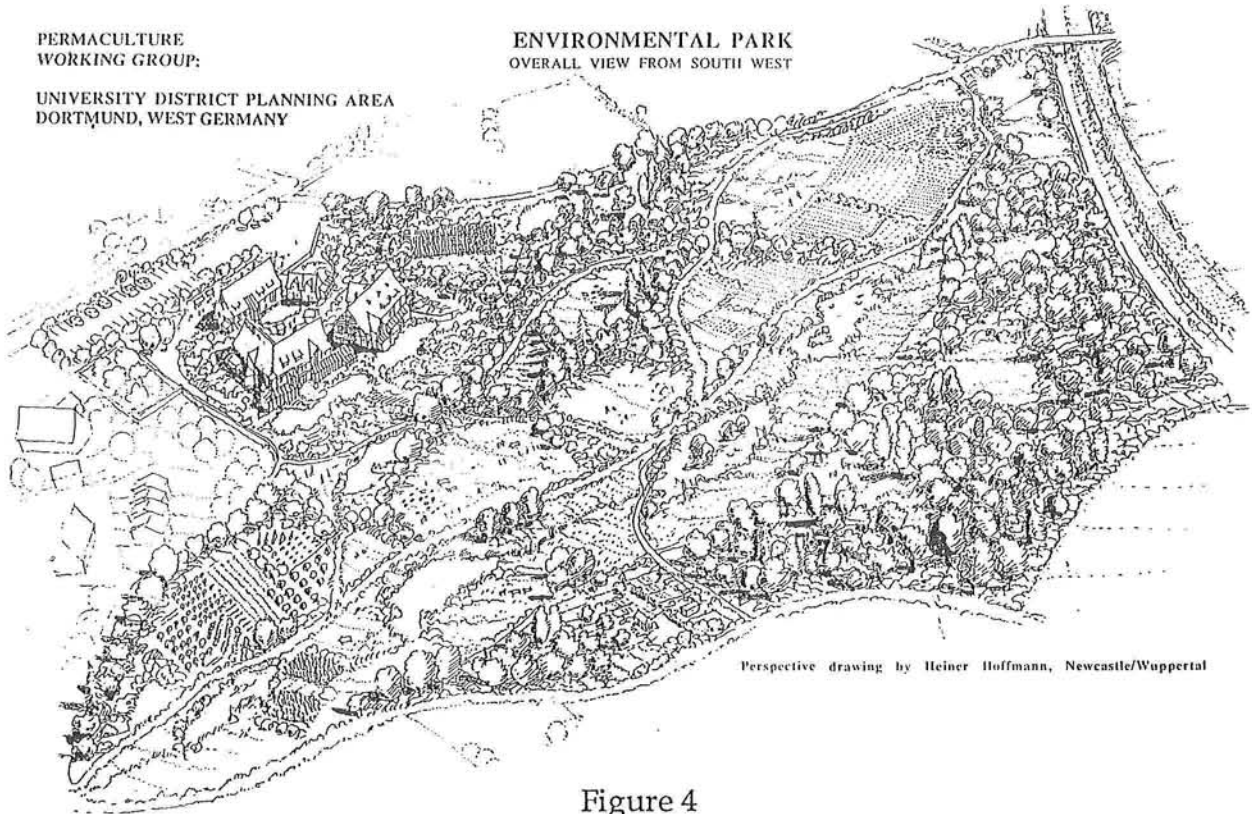


Figure 4

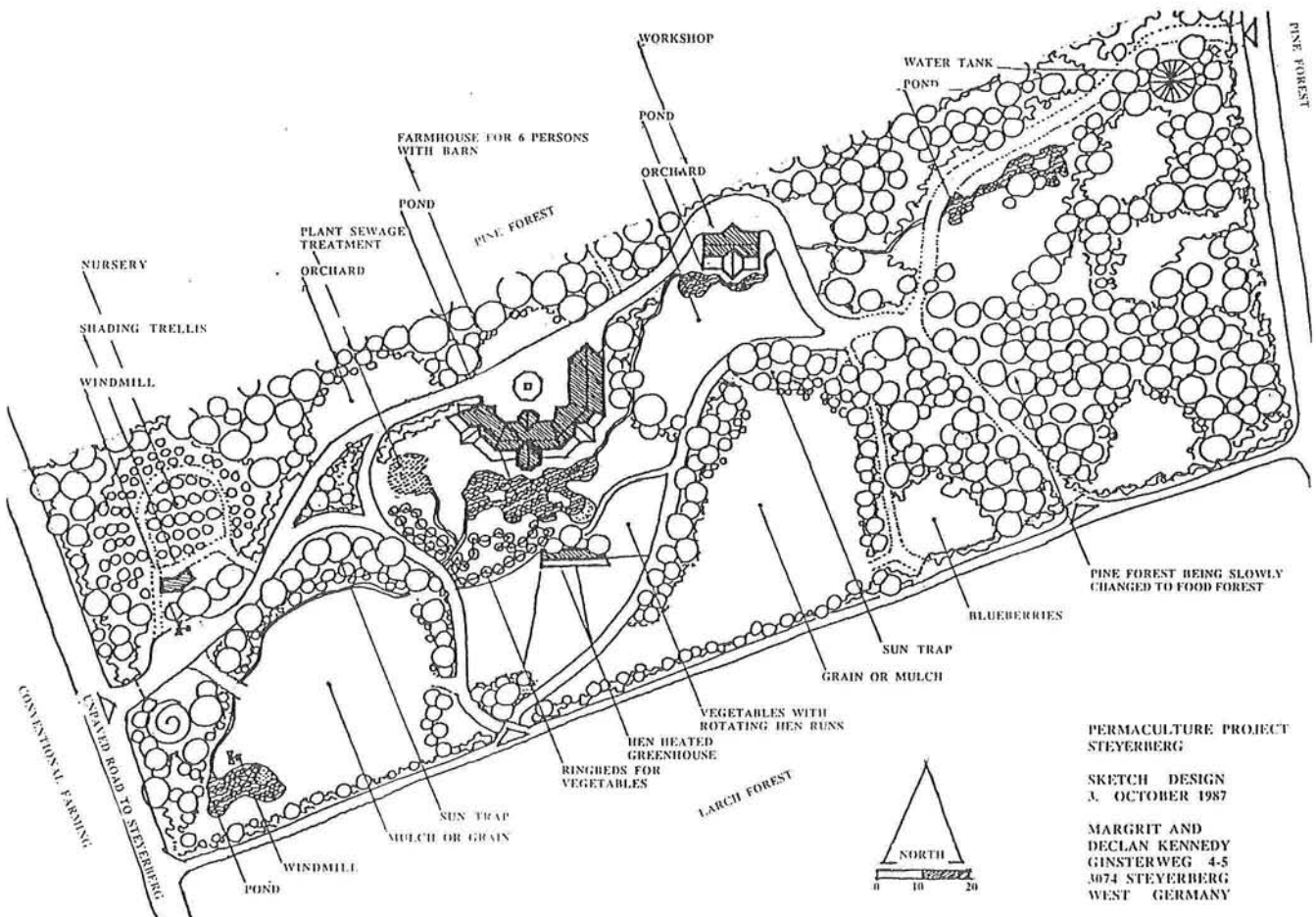


Figure 5



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I go back to the bad news because that is the system we have now. We have beautiful areas all over Europe which won't exist by 1994 if things go on as they are with acid rain, etc. The area for the 1994 winter games in southern Germany will be unreachable because of the avalanches. So why do we do all this experimentation? What's the use? I believe that if we help nature, we can get it back again. We have done an awful lot of damage to nature and we continue doing it, so first of all we have to reverse this. And really, we have to do something about it every day. The other thing is that the other threat we have are all these Chernobyls around us. Chernobyl is just the first one to break down.

I believe that the only thing that we can use against Chernobyl is the energy that we have within us - maybe it's spiritual energy, maybe it's god energy, call it whatever you like - but we have a lot of feeling energy within us. We can heal people already by holding our hands towards, around or near them. We can also heal the earth with our energy. When you see a leaf that has been broken off, the aura is still there for a certain period of time until it's dead. Even when we are ourselves not quite in order, we still have healing energy within us. We had a fantastic example in Steyerberg after Chernobyl.

We got into a panic about what we could eat. It was just the time that we, in a permaculture way, would start to eat all the wild herbs that were around us and we were afraid even to take them out of the garden. So we got an 80-year-old man, a German who had worked in Britain on radiation after the war until he retired. He came along with all his Geiger counters and all his different things, measuring everything around us. We had a bit of luck. We weren't in a bad area, except for one thing and that was our pond. One of our community members had built just that weekend of Chernobyl and had taken the rainwater pipes from eight houses and drained all the water into it, so we had a concentrated Chernobyl in the pond. It had the highest reading - something like five times the normal radiation that we should have in that area.

Another of our members, a girl who works with Reiki healing - she had learned about it from her readings of Japanese monks after Hiroshima and Nagasaki - spent an hour giving her energy to the water. We measured it and the water was normal. This old scientist went into a flap because it was not scientific. I said, 'It's no scientific thing. It doesn't matter, but I've experienced it. That's enough for me.' I'm not saying we shouldn't go on trying to convince our governments to get out of nuclear power. I'm not saying that we shouldn't keep going on the political level, doing our best to get away from this danger that's in front of us. What I'm saying is that if we only believe in our own healing systems, we can get going. We have to work with the organisms - the micro-organisms and this completely different type of organism that we've been talking about now. We have to work with it through our energy. I don't know whether it's all that necessary to get ourselves so organised. So my question at this conference is, perhaps we not only have to think from the organisation to organism, but also the other way around.

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## SUMMARY

### PRODUCTION OF FOOD - TODAY AND TOMORROW

Within the theme of production of foodstuffs in urban ecologies,  
we can already see some positive directions:

1. Daily news of catastrophies dealing with poisons in foodstuffs has raised the consciouness among many people which is becoming more wide-spread. Therefore environmental degradation is becoming more obvious and evident.
2. Somewhat less evident is the fact that our present agricultural systems have no standing any longer and have little future, because of the need to save energy; this fact is being covered up by enormous government subsidies in agriculture, mainly in industrialised countries.
3. In the long run we can only solve these problems through decentralised production of food near the home, especially of fresh produce (herbs, salads, vegetables, etc.).
4. Productive plants afford the city dweller a new contact with nature and green open spaces.
5. Productive plants make it possible for city people to find a new connection to planting, growing, taking care of something; to harvesting and cooking.
6. Other ecological factors can be connected with planting and with each other: rainwater and grey water can be used for watering plants; composted organic wastes can be integrated into a natural cycle as fertilizers; a considerable amount of energy can be saved by the use of the 'greenhouse' effect; inside temperatures can be greatly improved by solar lean-to greenhouses; and the indoor climate can be improved through the outlet of humidity and oxygen by plants.

**First Principle:**      Every element should serve many functions

7. A high level of self-sufficiency in the city is possible if about half of the existing open spaces are transformed into productive areas within the next few decades. By open areas, we mean not only decorative gardens, parks, courtyards, façades, edges of roads, highways, and balconies, but also unused attics and roofs where all year round production can occur in the open or under glass.

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**Second Principle:** Every function is supported by many elements

8. New methods of mixing and juxtapositioning of plants in a polyculture (by stacking plants in heights, types and growth periods), will lead to less 'pests' and 'weeds' and to a better use of land, soil and sun. Covering the earth with mulch leads to less evaporation which means less watering and less weeds. New harvesting methods (instead of taking the whole head of lettuce, just cutting off the large leaves) and the use of perennial and self-seeding plants can achieve the highest overall yield with a minimum of work and input of energy (15 minutes per day on an average over one year for 80 percent of vegetables, salads and herbs for a three person household).

**Third Principle:** Instead of maximizing one particular item, the aim is the optimization of the overall yield

9. Through decentralised production of fresh groceries in the city at the immediate doorstep, a 95 percent savings of the necessary energy for transport, storage and packing can be achieved. Products that can be stored well (grains, potatoes, cabbages, etc.) can still be produced in the countryside as they have either long growth periods or large areas are necessary for their production.

**Fourth Principle:** Work-intensive production for daily use should be located near the kitchen door, whereas work-extensive production should be located furthest away

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