To The **Independent Review of Aid Effectiveness Secretariat**:

I believe that permaculture has a major role to play on the world stage. Permaculture is about design systems thinking. If we can introduce this methodology we leave behind an empowered group able to design their own solutions.

As a design system, permaculture has so much potential to positively impact on aid and development projects around the world. Not only does it address issues of depleting soil, water and energy, but it creates empowered communities who can become more self reliant and less dependant on aid and more able to direct the aid they receive into positive capacity building projects. In establishing successful permaculture projects around the world, we are also creating skilled designers who prove that permaculture systems work.

As change is forced upon the world at an unwelcome rate, it will be crucial to have successful models on the ground. Through implementing permaculture, aided communities of today have the potential to become the models for sustainable practices for tomorrow.

Please find my submission attached.

Sincerely,

Rick Coleman
Southern Cross Permaculture Institute

THE ROLE OF PERMACULTURE IN ATTAINING SUSTAINABLE AID PROJECTS

Rick Coleman

INTRODUCTION

In Moyale, Kenya, where I worked in 2000, the town was assisted in the drought by construction of a huge dam for drinking water. The dam was not fenced off and the community was not educated in its use and management. Consequently villagers took their cattle to drink from the dam. The cattle eroded topsoil into the dam reducing water capacity and polluting the water. When it did rain, cattle manure was washed into the dam, dangerously polluting the water. The highly polluted water attracted mosquitoes leading to a malaria outbreak.

In Begnas (a cluster of communities in the mountains of Nepal) the U.N. engineered the construction of sewerage pipes throughout the region to improve sanitary conditions for the district. This project was not as successful as they would have liked because Nepalese farmers kept smashing the sewerage pipes and fertilising their crops with the outfall. Disease outbreaks were regular as a result.

We often find it hard to comprehend why situations like this arise, but there is usually a logical reason. In this case, people lacked fertilizer or money to purchase fertilizer. Fertilizer is needed to grow food. The people were really making a choice; if we smash the sewerage pipes we could get sick. If we don't we will starve.

When there are a number of problems impacting on a region suffering food shortages, and because there is often urgent need, time becomes a critical factor. Singular solutions may be rushed in with good intentions. In many cases, the quick fix solution requires huge infrastructure, expert technical advice and often is not understood by the community supposedly benefiting from it.

THE PERMACULTURE APPROACH

What is the fundamental difference in a permaculturist that makes us valuable to aid? We are generalists rather than specialists. In other words we know a little bit about everything but we're experts at nothing. We're systems thinkers, pattern thinkers, we have the ability to see and make systems connect.

Importantly the nature of poverty and village life causes the development of a diversity of skills and consequently a diverse range of thinking in third world communities. This allows permaculturists the opportunity to make strong and quick connections and relate to the culture more easily.

We are landscape readers. Initially permaculturists were readers of the physical and natural landscape. But I have seen that evolve to include social, structural and

economic scapes. We are skilled designers. Rather than being overwhelmed by problems we are stimulated and absorbed by them.

Integration

Anyone can throw in new ideas. It is the permaculturist's ability to integrate systems that makes us successful. Integrations not only influence the direct connections but often have positive side effects. The classic permaculture chicken tractor is an example. (refer appendix for details on chicken tractors)

When I arrive in most rural villages in the developing world I am dismayed to discover chickens everywhere. Chickens roam at leisure through the yards in the village. They use up energy fossicking for food, which reduces their egg production. Their manure is dispersed, potentially polluting the waterways and not utilizing fertilizer where it is needed. When not watched closely they damage crops and they raid the home veggie patch. Their eggs are hard to find and worst of all when you eat them they're tough as steel rope.

In a well designed enclosure using a rotational system, chickens can provide the fertilizer directly to the garden, weed and plough the area to clean up any residual pests and weed seed, then move on to the next area while crops grow in the first. By fencing them in this way we get fertiliser where we want it, weeding, fallen fruit cleared up, insect management, eggs where we want them and tender fatter chooks. The chickens also benefit and we gain the side effects of less garden damage, less pollution.

How you design your chicken tractor system depends on how you then integrate it to match materials available, skill levels in the community, and cultural patterns. Bamboo dome in India, gliricidia living fence in Guatemala, stone fence in Peru, palm dome in Nepal, mobile chicken wire on wheels in Melbourne suburban garden.

Initially we start with simple interpretations and evolve from there. Once we have left people will continue to connect and innovate if we have successfully taught the thinking methodology.

Appropriate and Replicable Technologies

If you are going to introduce a new technology these are some things to consider.

- Can you use materials that are inexpensive or free, that are easily accessible and safe?
- Will it have a tangible positive effect for the community as well as the aid organisation?
- Most importantly is it repeatable? (ie: If you build a grand darble dooble funky and leave can anyone build another one? If it breaks down, can anyone repair it?)

- How can the technology be integrated to solve other problems or connect other elements and therefore become more productive?

Following are a number of examples of replicable, readily transferable and simple technologies that SCPI have developed during project consultancies. These are positive solutions using permaculture principles, and are outlined in more detail with photos and diagrams at the end of this paper.

In Peru I worked at high altitude with indigenous indian communities. It was freezing up there and l was there in the summer. The huts were mudbrick of a kind with large square holes cut in the wall to act as windows. All open to the outside air. Apart from the buildings being freezing, excess firewood had to be gathered to compensate for the draught.

The farmers would take crops to sell down to the larger tourist towns below on weekends and walk back home. I noticed these towns had a waste problem. Thousands of beer, wine and spirit bottles were stacked up behind bars. After checking that no-one minded we began carting bottles back on our return journey.

We used these to make bottle windows. The bottles were packed with mud around them to hold them in place. Once we'd built one, all the villages were easily able to build their own by replicating the simple but appropriate technology. There were flow on effects apart from making the buildings more habitable – waste was cleared and reused as a resource, less firewood was consumed saving a precious resource in the highlands and reducing the labour required to collect it, the people were empowered and happy with the solution, which led to their interest in further sustainable ideas.

A similar approach was adopted on a project in Guatemala. The males in the community would walk up to four hours to their land parcels, work it, cut firewood for cooking and return home laden with huge bundles of wood. Meanwhile in their stick huts the women were confined inside, cooking their beans for four hours a day on an inside fire. She couldn't leave the hut for fear of it burning down. Being in the subtropics they had generously been supplied with tin rooves. This meant the huts got to 40 degrees by 10 o'clock.

We came up with an idea based on the model of an insulator / thermos but using locally available materials and knowledge. Known as "the clay oven" it was constructed with abundantly available bamboo, which provided the insulating air layer. Around the bamboo uprights, clay was packed and moulded to provide space for a typical cooking pot. The lid was the round tray traditionally used for heating tortillas over a fire. The pot of beans needed to be cooked on the fire for an hour, then it could be placed with coals into the clay oven, the lid placed on top and covered with banana leaves, and then left to cook in its own heat for another 4 hours.

The outcome of this design was again multifaceted. The women had three extra hours during the day, the huts were in less danger of burning down, as well as far more inviting to be in, and the reduction of 75% in firewood use had environmental benefits as well as freeing up the time available to the men to work their land more productively.

Significantly, by the end of the training, six had been built in the village and by the time we left Guatemala, almost every household in the village had one. Many were also now housed in little shelters to protect them from the wet season downpour.

Magnification

The cost of getting a consultant overseas and maintaining them whilst on a project is high, in both energy and dollar terms. To justify that cost we try to ensure that whatever is implemented can be multiplied quickly, and that we leave trained people behind to continue the work of the project.

In Guatemala we worked for Oxfam Australia with a group called CONIC (Central National Organisation for Indigenous and Campesino Farmers). In developing the project we decided to work at two levels; firstly working directly with communities at a micro level, determining the issues facing the people and designing solutions to many of these issues in consultation with community leaders, training villagers in techniques such as building swales, constructing grey water treatment systems, building clay ovens and chicken tractors. We did this for two months, creating tangible examples of the concepts we were teaching.

We then went to Guatemala City to train the CONIC staff, who worked with over 200 communities. After a week of theory, we took the staff up to the villages we had worked in, demonstrating the techniques, providing examples of how much the villagers had understood, and showing how these strategies had positively impacted on the communities. The CONIC field officers worked in areas as diverse as health, education, agriculture and women's programs in their communities. All could see the potential application of permaculture as useful in their fields.

CONIC incorporated permaculture into its national policy. They service 70 000 people. Because we taught a Permaculture Design Course to CONIC staff we left behind 20 potential teachers. They were able to continue independently and successfully, magnifying the impact we were able to have from one community to 200.

Culture

Cultures shift and change over time. In World War II the Italians came down through Ethiopia and fought the English down into Kenya. Spaghetti is now one of the most popular dishes in Ethiopia. There are a few cultures that cling to tradition with no change, conversely there are examples of cultures being rapidly overwhelmed by a flood of changes to the point of social disintegration.

As aid workers we are constantly brought into foreign cultures to assist in development. Do we have the skills and knowledge to counter or balance issues of cultural change? Do we have a right to patronisingly decide what will or won't have impact? I believe that the best we can do is be aware of cultural issues at all levels, be aware of the potential for negative impacts and promote that awareness with all

players. Participatory planning and decision making which includes the elders or leaders of a community in all phases of the design process can help our effectiveness in training. We assess the problems in conjunction with community leaders, present a range of issues and options, and encourage the leaders to monitor and discuss benefits and costs in an ongoing manner. If we remain sensitive to possible issues, act conservatively and cautiously and leave decision making power in the hands of those affected we can still be effective.

We are paid as consultants, advisers and/or designers and we are expected to come up with ideas and solutions. However any changes that are implied also imply previous error. It is important to be sensitive to this. Build from strengths in preference to attacking weaknesses. For example, rather than replacing a traditional crop with a more productive crop, try looking for ways to improve the productivity of the traditional crop.

Reading the cultural landscape is as important as reading the natural landscape. Introducing intensive vegetable gardens to a hunter gatherer culture is bound to fail, because it just doesn't match their patterns of behaviour. An aid group brought in solar ovens to Southern Africa to reduce the pressure on fuelwood use. The ovens were rarely used, as culturally the women did their cooking before sunrise to avoid the heat of the day. We need to learn to work within cultural patterns of behaviour to be effective in bringing about positive change. This requires culture specific solutions such as the clay oven, rather than imposed solutions of a global nature.

Domestic behaviour, social and economic conditions, belief systems, ethics, those holding power, all have a considerable influence on the success of a design. It is critically important to constantly observe, ask questions, work with and bounce ideas off community members in order to map out a community's needs in a short time. Identifying contradictions and recognising patterns from other cultures are also important, as is looking for confirmation of information gathered.

Contradictions can appear for many reasons. Sometimes it is the belief that there is a particular answer that you (the perceived expert) wants to hear. Other times it may be that the question has not been phrased in a way that elicits a useful answer. For example in Kenya I asked "do you have a problem with the winds here?" The answer came "No, we don't notice it." But when I asked "Do you often have sand blowing in your face?" the answer was "All the time." Constant questioning can help identify contradictions and overcome barriers to good design.

The more risk in a project the less willing the participation and less likely the successful uptake. As there are often no safety nets in these communities, it is critical that the risk is placed as much as possible with the institutions supporting the project. Small, low cost demonstration sites, where crops and innovations can be tested are very useful. These can double as research centres, community seedsaving banks, and trials of agricultural or forestry department recommendations. Once these are proved successful, the uptake in the communities will be higher, with reduced risk of crop failure and resultant hunger.

Further examples of specific technologies implemented on various projects are outlined in the Appendix. Pictures and diagrams are included. However, to read these

and replicate them in other projects without first assessing the needs of the community would be just as problematic as large-scale technologies breaking down.

Finally, permaculture is information and imagination intensive, thus lending itself to be followed up even from a distance, by email or internet. If we design well enough we create spare time and energy. When communities have those, they then have the ability to move quickly. I believe in any permaculture aid project, training participants in the PDC (Permaculture Design Course) is integral. Permaculture is not about clay ovens or water management systems. These are techniques applied to solve specific problems. Permaculture is about design systems thinking. If we can introduce this methodology we leave behind an empowered group able to design their own solutions. Successful projects can then host new permaculture volunteers in a mutually beneficial way leading to further training and implementation. An integrated approach tends to lead to higher uptake and therefore better success rates.

I believe that permaculture has a major role to play on the world stage. As a design system, permaculture has so much potential to positively impact on aid and development projects around the world. Not only does it address issues of depleting soil, water and energy, but it creates empowered communities who can become more self reliant and less dependant on aid and more able to direct the aid they receive into positive capacity building projects. In establishing successful permaculture projects around the world, we are also creating skilled designers who prove that permaculture systems work. As change is forced upon the world at an unwelcome rate, it will be crucial to have successful models on the ground. Through implementing permaculture, aided communities of today have the potential to become the models for sustainable practices for tomorrow.

Author's bio

Rick Coleman is a permaculture designer teacher and consultant. He has taught permaculture on every continent and consults with aid agencies to develop sustainable development projects. More information on aspects of this article can be found on the Southern Cross Permaculture Institute (S.C.P.I.). website at www.southerncrosspermaculture.com.au

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APPENDIX

Examples of Replicable Simple Technologies

- **Chicken tractor systems**

When I arrive in most rural villages in the developing world I am dismayed to discover chickens everywhere. Chickens roam at leisure through the yards in the village. They use up energy fossicking for food, which reduces their egg production. Their manure is dispersed, potentially polluting the waterways and not utilizing fertilizer where it is needed. When not watched closely they damage crops and they raid the home veggie patch. Their eggs are hard to find and worst of all when you eat them they're tough as steel rope.

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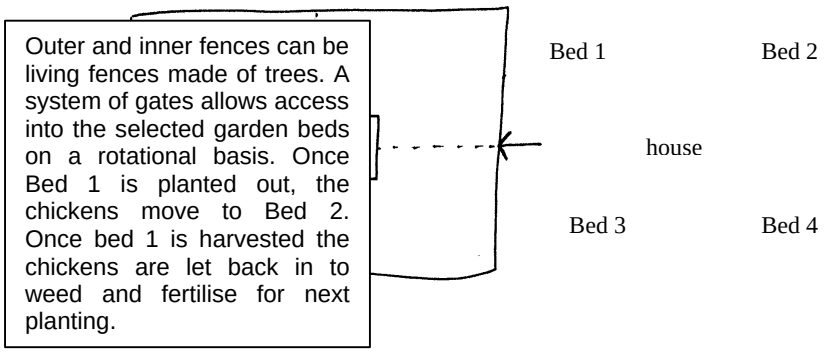
Example of a Chicken Tractor Design



With these simple example involving only a few elements, you can see how interconnected systems can be created that benefit the whole system. With new information and good design food security and income stability can be realized in many cases. Permaculture designers have a vital role to play in the implementation of such systems, empowering communities with knowledge and skills to help themselves.

- **Bottle Windows in Peru**

In Peru I worked at high altitude with indigenous Indian communities. It was freezing up there and l was there in the summer. The huts were mudbrick of a kind, with large square holes cut in the wall to act as windows. All were open to the outside air. Apart from the buildings being freezing, excess firewood had to be gathered to compensate for the draught.

On weekends the farmers would take crops down to the larger tourist towns below to sell, and then walk back home. I noticed these towns had a waste problem. Thousands of beer, wine and spirit bottles were stacked up behind bars. After checking that no-one minded, we began carting bottles back on our return journey.

We used these to make bottle windows. The bottles were packed with mud around them to hold them in place. Once we'd built one, all the villages were easily able to build their own by replicating the simple but appropriate technology. There were flow on effects apart from making the buildings more habitable – waste was cleared and reused as a resource, less firewood was consumed saving a precious resource in the highlands and reducing the labour required to collect it, the people were empowered and pleased with the solution, which led to their interest in further sustainable ideas.

Children help collect bottles for bottle windows and greenhouse project.

Following the success of the bottle windows, the community decided to build a hothouse for an extended growing season using waste bottles. This project was completed by a group of young people in the community as part of a youth training course in permaculture.

Constructing the greenhouse of bottles.

- **Clay Ovens in Guatemala**

A similar approach was adopted on a project in Guatemala. The males in the community would walk up to four hours to their land parcels, work their land, cut firewood for cooking and return home laden with huge bundles of wood. Meanwhile in their stick huts the women were confined inside, cooking their beans for four hours a day on an inside fire. They couldn't leave the hut for fear of it burning down. In the subtropics they had generously been supplied with tin rooves. This meant the huts got to 40 degrees celcius by 10 o'clock in the morning.

We came up with an idea based on the model of an insulator / thermos but using locally available materials and knowledge. Known as "the clay oven" it was constructed with abundantly available bamboo, which provided the insulating air layer. Around the bamboo uprights clay was packed and moulded to provide space for a typical cooking pot. The lid was the round tray traditionally used for heating tortillas over a fire. The pot of beans needed to be cooked on the fire for an hour, then it could be placed with coals into the clay oven, the lid placed on top and covered with banana leaves, and then left to cook in its own heat for another 4 hours.

Open fires for cooking inside a stick hut in the tropics led us to design an alternative

Men cut the bamboo into pieces for use as insulating material

Rick demonstrates packing the mud

The insulating bamboo is put into place

Finishing off this oven

The outcome of this design was again multifaceted. The women had three extra hours during the day, the huts were in less danger of burning down, as well as far more inviting to be in, and the reduction of 75% in firewood use had environmental benefits as well as freeing up the time available to the men to work their land more productively.

Significantly, by the end of the training, six had been built in the village and by the time we left Guatemala, almost every household in the village had one. Many were also now housed in little shelters to protect them from the wet season downpour. One of the key factors in the rapid uptake of these ovens was that we prepared a community feast to celebrate the end of the training. We cooked a nutritious bean stew with a number of vegetables available at the local market but not often used or grown by the community. The villagers enjoyed the feast and their initial scepticism about the oven working properly was overcome. The proof was in the pudding as they say.

Our frijoles (beans of course) and vegetable casserole impresses the villagers.

- **Small Scale Solutions in Nepal**

In implementing permaculture design, I am always conscious of working within the culture of the region, utilising the traditional crops, skills, materials and knowledge of the communities involved.

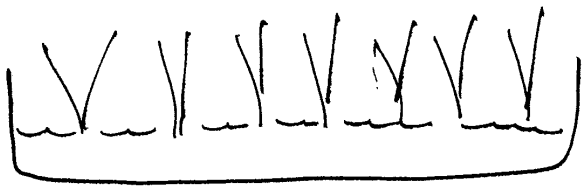
In Begnas, Nepal the communities grow rice up the hillsides during the wet season. Pesticides and soluble fertilizers pollute the waterways running into the lake below, causing serious damage to community health.

Land parcels are small so people grow rice from corner to corner in order to feed themselves. Many villagers suffer from a lack of protein. Because they grow rice exclusively they struggle to provide an income. So ways to increase food and protein production, income, and production of organic fertilizer are important considerations, as is decreasing pesticide pollution either through control or reduction in use.

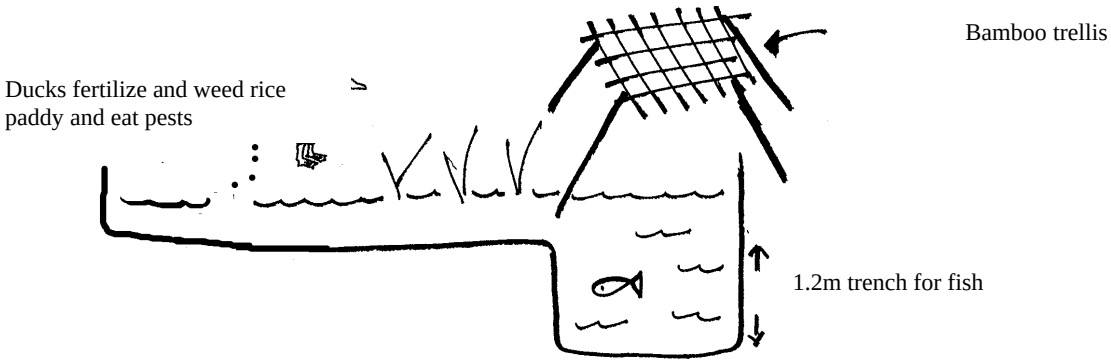
Pesticide use can be decreased by increasing the number of insect eaters on site. With good design we can introduce ducks and fish and integrate them in a positive way.
Fish cannot live in the shallow rice paddies as the water gets too hot during the day, and predators can pick them off too easily. They can reside in a small deep trench with a bamboo shade screen during the day and venture out at dawn and dusk to feed.

Ducks can be used as a pest disposal fleet. They are introduced after the fish become too big to be swallowed. Of course the ducks also supply large volumes of manure and many eggs, not to mention meat, a source of protein. The fish can be harvested at 300 grams and fetch good prices at the market whilst also adding some nutrient to the rice field by way of faeces. So we design a more efficient rice paddy that allows for increased production.

Current Rice Paddies



Proposed Fish-Rice-Duck System



	
Upslope rice paddies along contour	Carp from Koiralla's ponds

Example of a deep trench for fish in the rice paddy

Each rice paddy can be converted to the new system in 3 – 4 hours by one person with a spade and a few pieces of scrap bamboo. There is little technology required. Fish husbandry information, community workshops and seminars are freely supplied by the Fisheries Department.

- **Banana circles for grey water treatment**

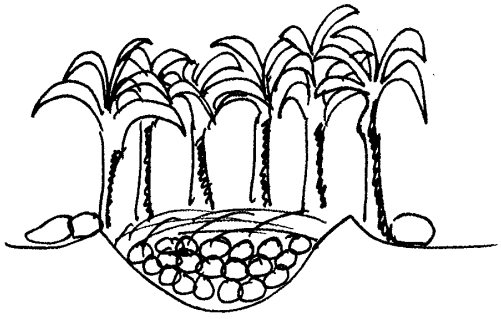
In Moyale, Kenya women currently carry water to the house in a 20 L drum. They do their clothes washing in the house and the waste water runs outside. This nutrient rich waste forms puddles immediately outside the building attracting malarial mosquitoes. If the women have to carry water by hand, we had better use that water more than once.

The banana circle is basically a round circle filled with rocks. The banana circle is constructed by digging a pit to 40cm depth. The soil dug from the pit is placed around it. Grey water runs into the pit. It is not exposed to mosquitoes as the water sits under the rocks. Bananas are planted around the pit to soak up the nutrient rich water.

Because much of the soil is sandy, when water does infiltrate it goes right through. So as not to lose the water before the bananas could access it we lined the pit with plastic rubbish bags that were lying everywhere. The plastic slows down the water giving plants enough time to take it up. The plastic is in pieces so water eventually travels through ensuring environmental patterns are not interrupted. The added bonuses of this are a tidier town and less cows and goats dying of plastic ingestion.

Paw paws were planted East and West of the pit to reduce sun on the bananas and to gain an additional crop.

A Banana Circle



Bananas grown around the pit

Rocks placed in pit then covered with mulch

New banana circle implemented during consultancy as a demonstration

Established banana circle