

## INTRODUCTION

1. Most conventional greenfield housing developments have fostered urban sprawl and created dormitory settlements which are not sustainable.
2. Many conventional greenfield housing developments are amorphous and disconnected monoculture environments which inhibit the establishment of socio-economic activities.
3. This perpetuate a "western lifestyle" that requires a substantial transport network to move people around to consumption centres that are fed on global trade.
4. This is exacerbated when a large proportion of people are unemployed and virtually become trapped in these dormitory settlements wherein the urban fabric provides very little opportunity for local economic employment.
5. This poverty trap eventually starts to undermine the social and community fabric of society and eventually leads to a downward spiral of despondency, delinquency, crime, malnutrition and HIV/AIDs.
6. This paper looks at Permaculture as a design tool for creating sustainable human settlements wherein the form and shape of town plan layouts can be designed in a holistic and integrated manner to provide for a mixture of residential, public, social and commercial facilities that blend in with areas for urban agriculture and environmental open space systems.

# THE APPLICATION OF PERMACULTURE DESIGN CONCEPTS FOR SUSTAINABLE HOUSING ENVIRONMENTS

**Ezio Gori**

M.Sc. Construction Management, MCIOB  
E. Gori & Associates – Project Management and Development Consultants

P.O. Box 1409, Umkomaas, 4170, South Africa  
Telephone : +27 (39) 973 0308, Fax : 086 671 8572,  
Mobile : 083 300 2385, E-mail : whatabuz@iafrica.com



## ABSTRACT

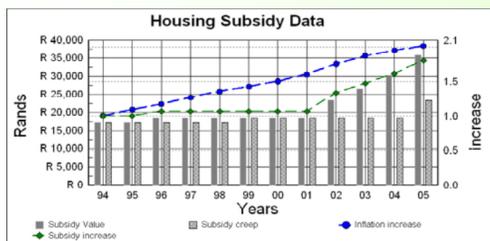
The delivery of low cost greenfield housing development in South Africa is generally characterised by low density, dysfunctional, monoculture environments that fosters urban sprawl, and which in turn, hinders opportunities for socio-economic upliftment. This reality has developed as a result of a recalcitrant norm of placing a detached house in the middle of a small site, which at times, is substantially reduced to fit budget norms. In fact, the post apartheid dream of addressing the injustices of the past by housing the nation in vibrant sustainable neighbourhoods has more than often replicated the same dormitory townships of the previous dispensation. This paper uses Permaculture design concepts to show how sustainable and holistic greenfield housing developments can be designed to cater for more functional and safer housing with greater opportunities for urban agriculture, open space systems and community facilities.

## THE ROW HOUSE CONCEPT

1. Even though the housing subsidy has now caught up with inflation, the perpetuation of the current reality of greenfield housing developments ought to be strongly resisted.
2. A great opportunity now exists to "make the subsidy work", but what it requires is a paradigm shift in the way that greenfield and infill housing projects are planned.
3. This paradigm shift requires a leap of faith amongst housing professionals, away from the small detached house site in the middle of a site towards the row housing concept.
4. The basic financial and social economies of the row housing scheme was long grasped in Europe and the USA at a time when urban centres were under severe strain during the onset of the industrial revolution.
5. The row house concept only consumes a 5 metre frontage, thereby halving the normal cost for a serviced site and leaving a greater housing residual for a top structure shell of up to at least 40m<sup>2</sup>.
6. The cost of a typical row housing scheme with a 125m<sup>2</sup> serviced site with water borne sanitation and asphalt roads is therefore:- professional fees ± R2,500; land ± R600; services ± R6,000; housing residual ±R22,900; with total ± R32,200, excluding the 15% allowance for adverse terrain and/or locality.

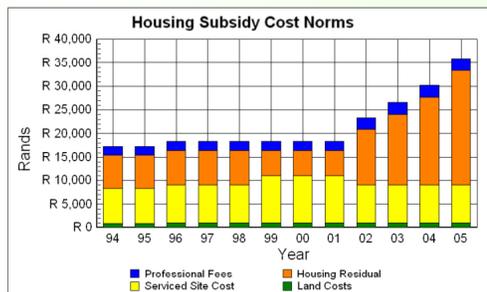
## INSTITUTIONAL PROBLEMS WITH HOUSING DELIVERY

1. Lack of capacity with the change in the status of the housing developer from the private sector to the municipalities from around 2000.
2. Withdrawal of skilled private sector housing professionals from the industry.
3. Complexity with the Peoples Housing Process, which as noble and empowering as it is intended, merely added another layer of confusion, especially insofar as the contribution required by beneficiaries.
4. The recruitment scramble for housing officials with the right credentials has resulted in much job hopping thus lowering levels of institutional memory within provincial and municipal housing departments to maintain continuity of service.
5. Consequentially, the normal project cycle of 4 to 5 years for a typical 1000 site project is now extended to one of 5 to 7 years.
6. This extended project cycle plays havoc when the subsidy is fixed but has to include anticipated inflation.
7. This results in the "subsidy creep" wherein the subsidy approved at the inception of a project is severely undermined by the time the last house in the project is completed, even though the subsidy benefits from inflationary increases.
8. In order to circumvent the expenditure, the national department of housing has in recent years been increasing the value of the subsidy substantially compared to the earlier years as shown in Graph 1.

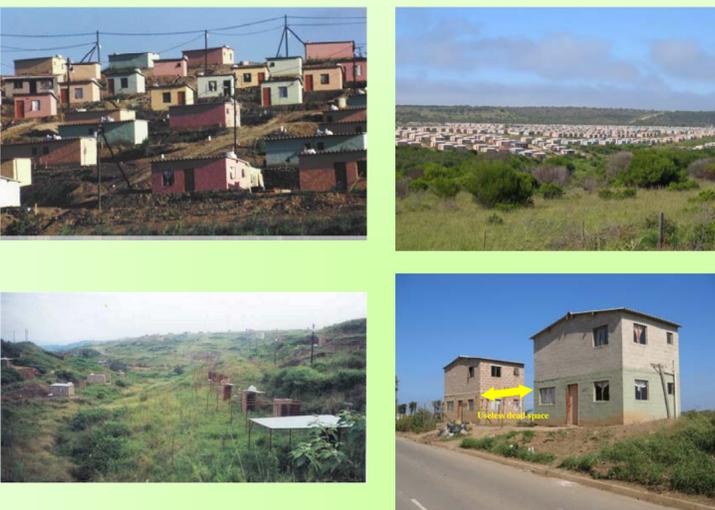


## DYSFUNCTIONAL GREENFIELD HOUSING DEVELOPMENTS

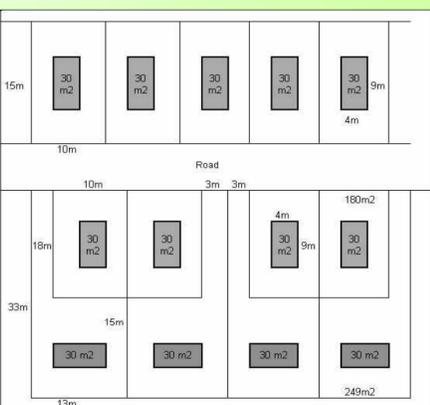
1. The institutional problems with housing delivery have had some major implications for the design of conventional greenfield housing developments, especially around the Millennium when smaller and smaller sites and houses were built to remain within the static subsidy.
2. Even the capping of site servicing cost by the Department of Housing could not halt approved and/or projects being constructed, hence the result of projects with very small houses.
3. The period around the Millennium was a crisis period wherein municipalities and developers grappled with the funding dilemma of how to make the subsidy work given the shrinking housing residual.
4. As a result, some of the worst examples of government housing was completed during this period which also coincided with the withdrawal of many private sector developers and housing professionals from the industry.
5. With this radical dearth of housing skills, the new crop of aspiring housing professionals do not have the vision and experience of their predecessors and usually replicate previous housing schemes.
6. And herein lies the problem, in that the form and shape, albeit smaller and smaller, of previous dormitory housing schemes are being replicated since there is no known alternative to serve as an example.



## THE CURRENT REALITY



Typical conventional greenfield housing layout

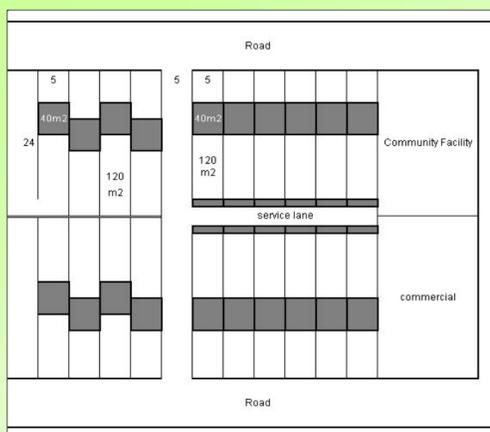


- higher servicing cost
- less housing residual
- less privacy
- less functional space
- predominantly on steeper land
- lower densities
- unsafe neighbourhoods
- lower economic thresholds
- higher energy use
- 30m<sup>2</sup> house

## THE PERMACULTURE DESIGN OPPORTUNITY



Typical row housing layout concept



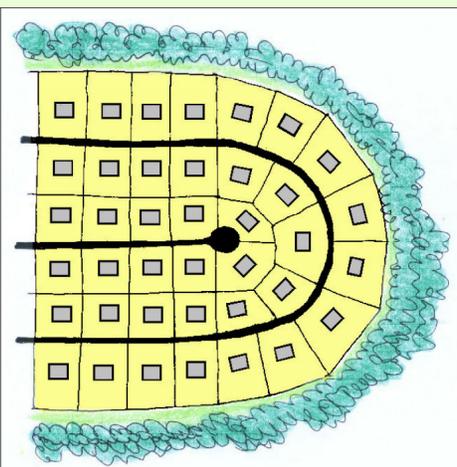
- lower servicing cost
- more housing residual
- more privacy
- more functional space
- predominantly on flatter land
- higher densities
- safe neighbourhoods
- higher economic thresholds
- lower energy use
- 40m<sup>2</sup> house

## PERMACULTURE DESIGN APPROACH

1. Permaculture is a term coined during the late 1970s to describe permanent systems of agriculture and culture integrated within towns and country.
2. Permaculture is therefore modelled on nature, which thrives in diversity, in comparison to modern lifestyles which are based on monocultures that basically destroy life.
3. Current greenfield town planning layouts typically blanket an area with built environment leaving little space for urban agriculture and natural open space systems.
4. A compact arrangement of row housing allows sites for commercial and public facilities within a village centre and creates opportunities for urban agriculture and an open space system.

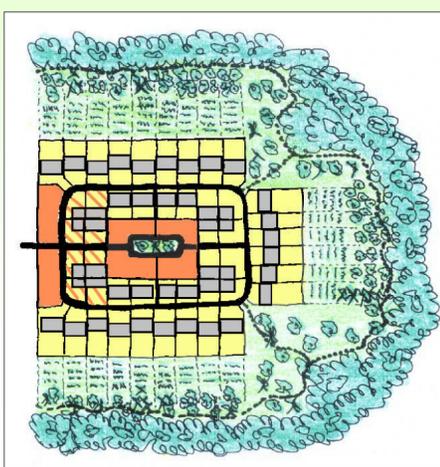
Zone	Permaculture zones for homesteads	Permaculture zones for village clusters
Zone 00	The Individual	The People
Zone 0	Home dwelling	Central park and town square
Zone 1	Domestic self sufficiency - pick and pluck plants for daily usage	Social self sufficiency - commercial, public and entertainment facilities
Zone 2	Small domestic stock and an orchard	Human stock and homestead gardens
Zone 3	Crops, forage and stored food	Agricultural allotments
Zone 4	Orchards, forage, forestry and pastures	Orchards and passive open space
Zone 5	Natural environment	Natural environment

## Typical housing layout on a spur development



A sterile, unhealthy, unsafe, mono-culture built environment that subdues community spirit and forms a barrier to the natural environment.

## Compact row housing layout within a sustainable environment



A vibrant, diverse and safe built environment that promotes a sense of community, urban agriculture and an appreciation of the natural environment.

"Embraces Permaculture zone principles"

## CONCLUSIONS

1. The form and shape of current greenfield housing projects are fostering urban sprawl and creating senseless and unsustainable settlements that are replicating the dormitory style townships of the apartheid era which create a hostile environments for residents.
2. Row housing should be seriously considered as an alternative to detached housing in order to apply the principles of Permaculture design which are rooted on sustainable development.
3. A paradigm shift is required amongst housing professionals in order to plan for sustainable housing environments, especially within inner city and other urban areas.