

# **BHAMBAYI ORGANIC FARMING PROJECT eThekwin Municipality**

## **Development Concept Plan**

**Version 1 – 15 September 2005**

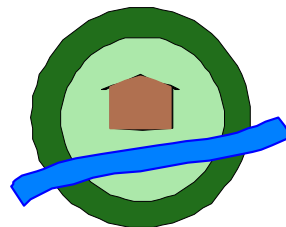
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# EXECUTIVE SUMMARY

## **Introduction**

This Development Concept Plan has been commissioned by the Greater Durban Community Foundation in order to outline a holistic approach for the Bhambayi Organic Farming Project, and in particular, how various public and private entities can collaborate towards achieving an affordable and sustainable project that can benefit the broader community.

## **Objectives**

The objectives of the project are to provide much needed opportunities for urban agriculture that can provide for food security; income from niche crops for the emerging organics market; and, urban greening within the greater community.

## **Methodology**

This project uses Permaculture design principles which are rooted in sustainable development and which embraces organic farming techniques and facets of low external input sustainable agriculture (LEISA). Low input costs will make operating costs affordable to beneficiaries and also result in relatively higher profit margins.

## **Project Deliverables**

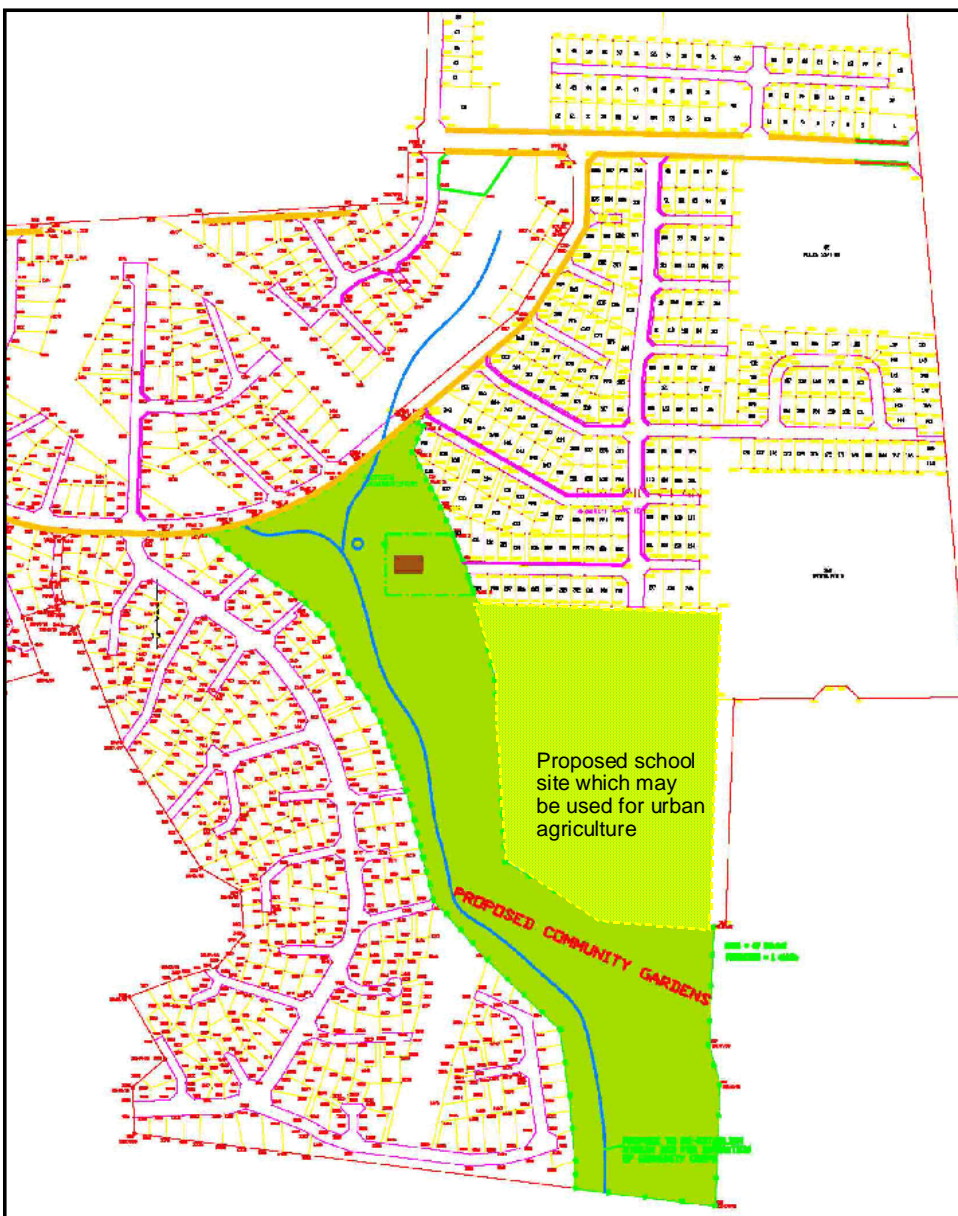
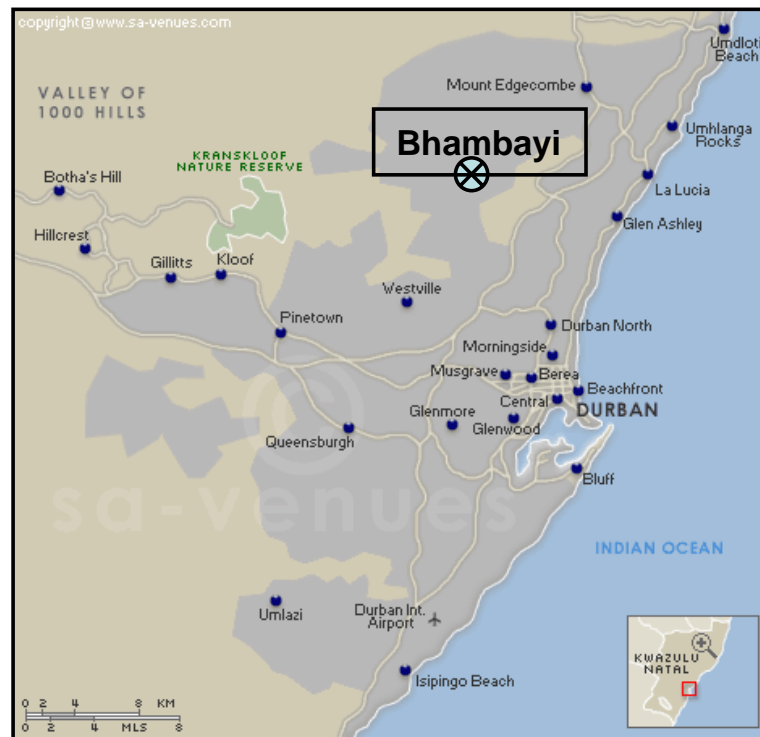
The Development Concept Plan makes provision for some 50 agricultural allotments of 400 m<sup>2</sup> each; a Farmers Co-operative Support Centre; and, 500 homestead gardens for a total budget estimate in current prices of R2,247,389. This translates to a cost of approximately R44,948 per allotment farmer, or, R4,100 each when considering all 550 beneficiaries for creating jobs at least or better than the poverty benchmark level. The development will take some 2 years to complete.

## **Way Forward**

The next steps are to prepare a detailed business plan that refines the physical site elements of this Development Concept Plan and thereafter lobbies for funding from various funding agencies. A project team should then be procured to plan, design, implement and commission the entire project under the control of a strong institutional management team selected from amongst stakeholder groups.

# DEVELOPMENT CONTEXT

The project area has already been identified by Harber & Associates as urban agricultural land within the town plan layout for the Upgrading of the General Environment for the Bhambayi Community funded under the auspices of the Human Settlement Redevelopment Programme, which in turn, forms part of the Inanda Ntuzuma KwaMashu (INK) Urban Renewal Programme. Although a large portion of the project area has been identified as a school site, it is unlikely to be used as such in the near to medium term, and has therefore been included in the project area.



The project area has been periodically used for agriculture but has shrunk in size due to the encroaching built environment and offers one of the few remaining parcels of land available for urban agriculture to households within the immediate community. The project should also realise its potential insofar as playing a catalytic role in the urban greening of newly established housing developments.



# SITE ANALYSIS

The project area of approximately 3,5 gross hectares is wedged between built environment and located alongside a small non-perennial stream. The stream has been partially blocked at one point by a temporary construction works access road whilst small culverts further upstream allow flows under a new road. The area above the temporary access road has since resulted in a small swamp.

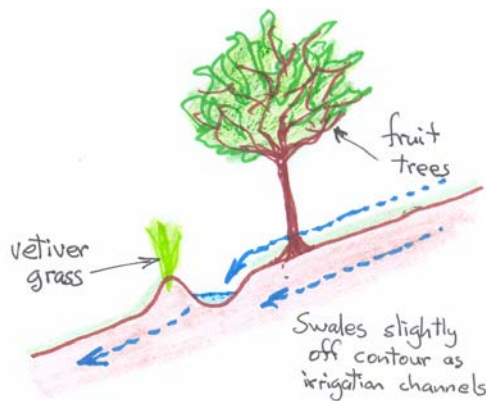
The slopes are fairly moderate and generally face the south west, thus being partially protected from the dry north easterly winds which cause wind burn amongst crops. A borrow pit has been created at the highest point and will therefore take considerable rehabilitation to render this area suitable for crops. For this reason, this area should be used for the location of any necessary buildings, polytunnels, reservoirs, etc.



The soils and water investigation conducted by Drennan, Maud & Partners indicates that the sandy loam soils at the valley bottom of the stream are fairly deep (+50cm) and will require drainage channels to avoid swamping the area during the rainy season. The soils on the slopes are shallow sandy loams and some clays (30-40cm) on top of a Dwyka tillite bedrock which drains the water table. Nevertheless, the soils are considered adequate for agriculture provided that sufficient irrigation is arranged. The investigation suggests that a borehole can be established in the “swampy” area, failing which, the swamp can be partially dredged and water abstracted directly from the ensuing dam.

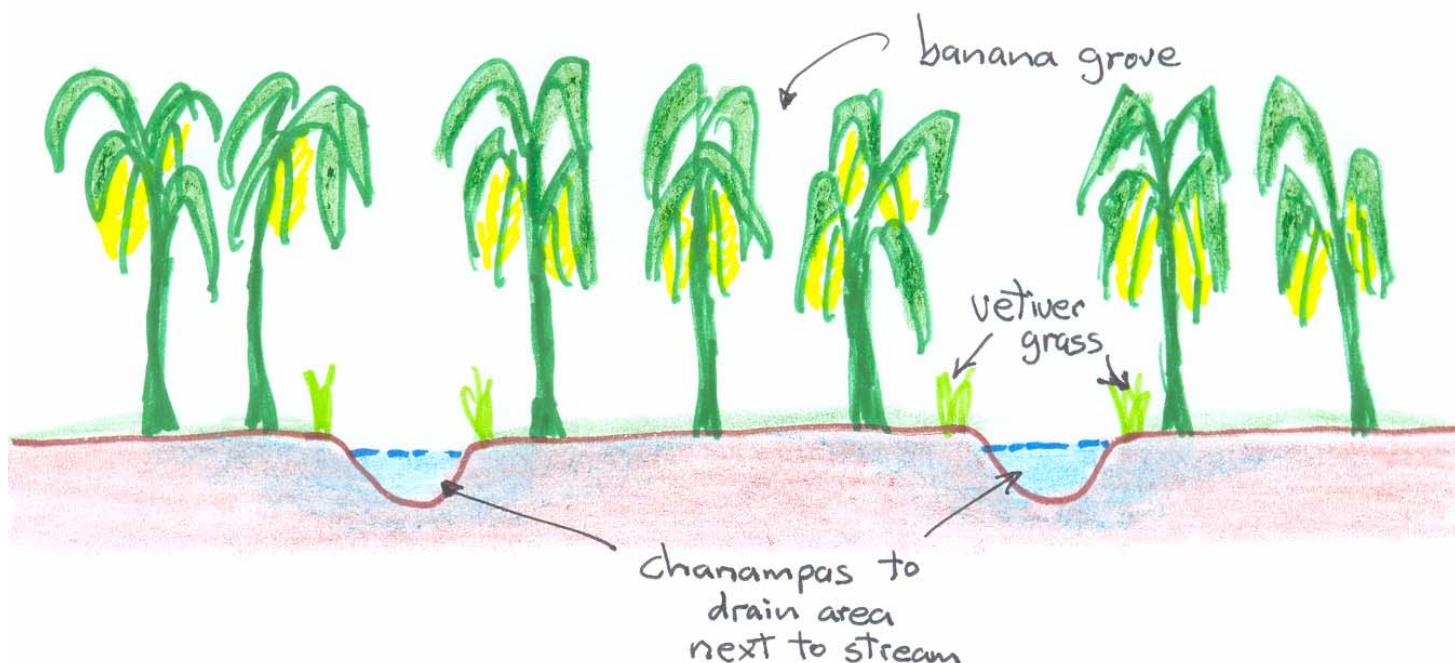
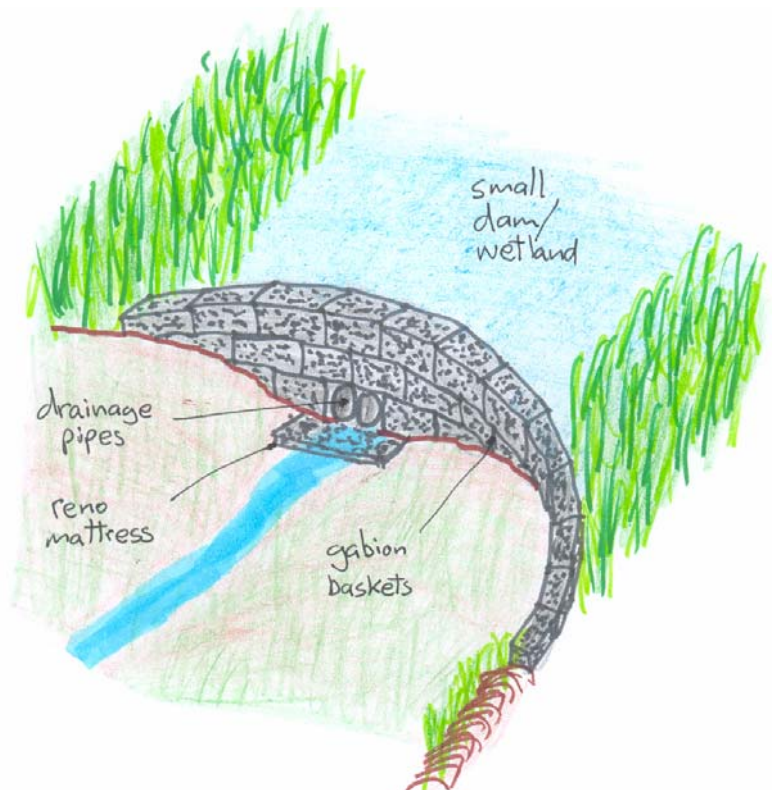


# SITE DESIGN CONCEPT – RAINWATER HARVESTING



A series of swales slightly off contour sloping downstream are proposed which can then also be used as irrigation channels fed from a gravity supply pipe from the reservoir. The area adjacent to the stream can be drained via chanampas whose tooth comb shape into the stream also allows the uptake of water during intense downpours. The chanampas are created by raising the ground level next to the stream with material excavated for the drains. The area within these chanampas are ideal for a banana grove which needs lots of water.

The non-favourable underlying rock strata on the slopes suggests that the project will need to rely substantially on irrigation and rainwater harvesting systems to be commercially viable. For this reason, it is proposed that a check weir be established across the stream where the existing construction access road traverses. This will create an upstream dam and wetland which will enhance the aquifer for the borehole and also provide a water abstraction point. Smaller check weirs are proposed in an erosion gully elsewhere on the site. Water can then be pumped to a reservoir located at the high point of the project.

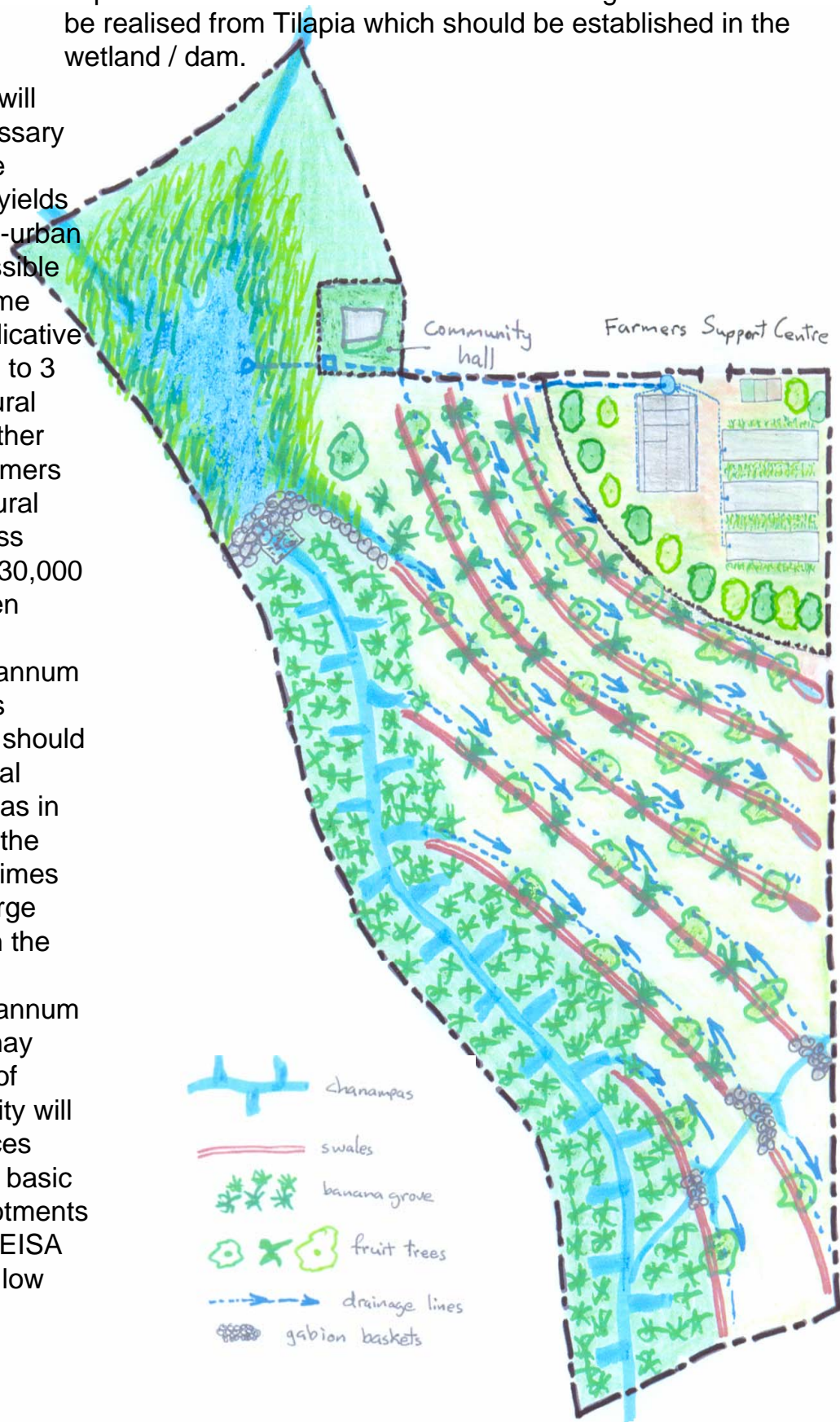




# SITE DESIGN CONCEPT – ALLOTMENTS

The 400 m<sup>2</sup> allotment unit will therefore have all the necessary site infrastructure to ensure relatively higher economic yields than those of rural and peri-urban areas. Although it is impossible to determine financial income streams for these units, indicative incomes will be at least 2,5 to 3 times as much as similar rural and peri-urban areas. In other words, if emerging rural farmers using LEISA principles in rural areas are generating a gross income of approximately R30,000 per annum per hectare, then urban farmers can “earn” approximately R3,600 per annum from the 400 m<sup>2</sup> allotments proposed in this project. It should be noted that the agricultural allotments within urban areas in Europe are known to have the same premium of 2,5 to 3 times the yield of conventional large scale agriculture. Although the indicative earnings of approximately R3,600 per annum per agricultural allotment may appear low, the real value of crops grown for food security will be far higher since it replaces income otherwise spent on basic food. Furthermore, the allotments have been designed with LEISA principles which makes for low operating costs and higher income margins.

A system of vetiver swales at approximately 20m intervals will provide the horizontal parameter of the proposed 400 m<sup>2</sup> allotments whilst the vertical parameters should be delineated by vetiver grass hedges. The vetiver grass on swales and hedges can in turn be used for mulching. Fruit trees should be grown slightly uphill from the swale in order to keep the channels free for gravity fed irrigation. The fruit trees and the banana grove contained within the chanampas will also provide much needed tree canopy, wind breaks, biomass, and in turn, improved economic returns. An added marginal income can be realised from Tilapia which should be established in the wetland / dam.





# SITE DESIGN CONCEPT – HOMESTEAD GARDENS

Not everyone will be able to have an allotment. For this reason, the initial trainees, who will become the new community based farm stewards, will be encouraged to assist with the establishment of homestead gardens at large for those beneficiaries who do not have access to an allotment. The homestead gardens may entail all or a combination of, the establishment of rainwater harvesting systems; the installation of a rainwater tank; plant material; fruit and nut trees; and, small tools. The value of these benefits is estimated at R2,500, including an allowance of R500 for the farm steward undertaking the “hands on” training and support.

In order to benefit from economies of scale, at least 500 homestead gardens ought to be established;- to provide continuity of work for the farm stewards; to make the ongoing

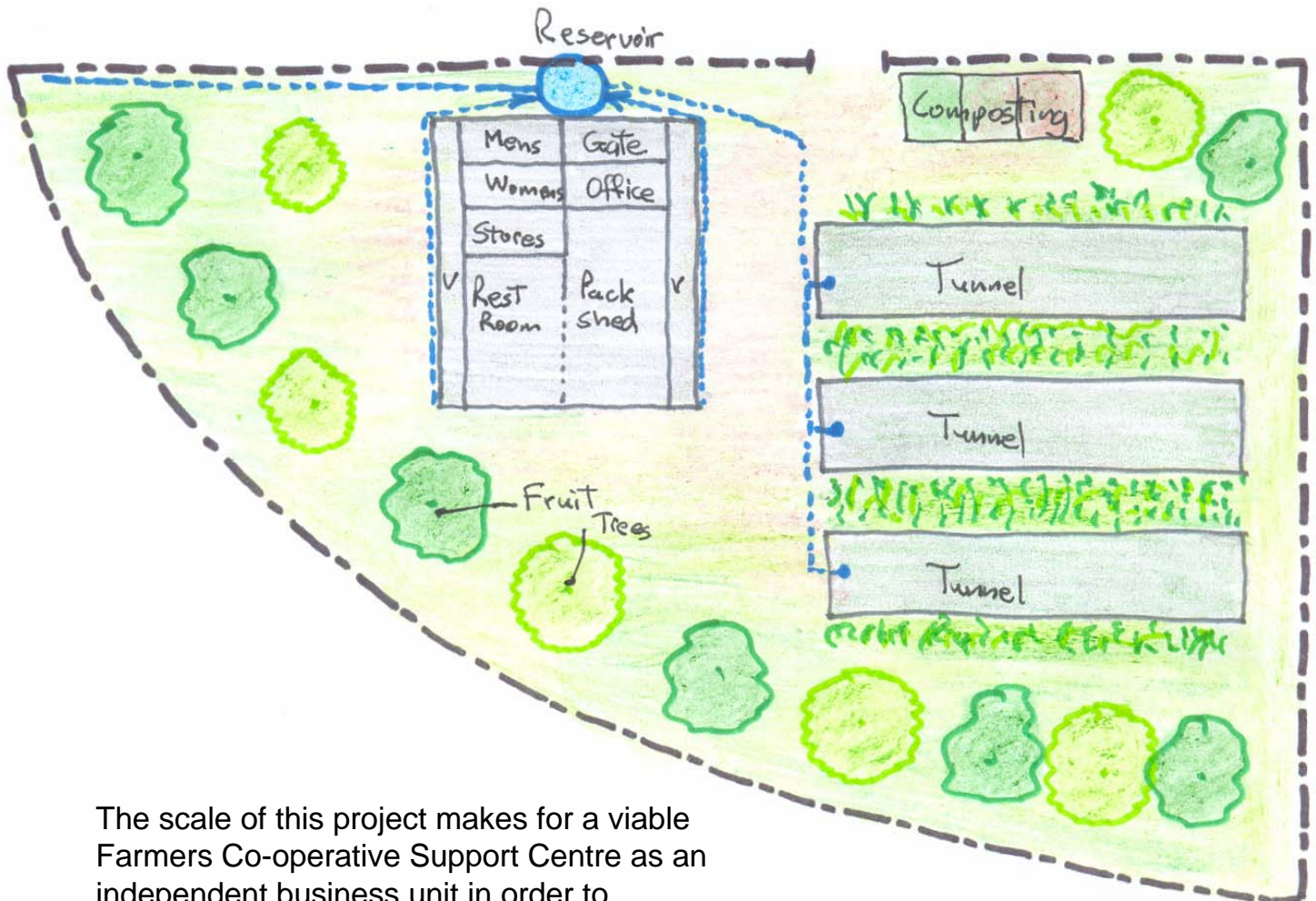
community workshops and mentoring a worthwhile exercise; to provide critical mass volume of crops for the viability of the Farmers Co-operative Support Centre; and, to make a meaningful contribution towards the urban greening of the community.

The proposed funding for the homestead gardens is based upon principles developed by the Grameen Bank. Small loans of up to R2,500 for homestead gardens will be granted to households who qualify and for whom another four households will provide collateral guarantee that the loan will be repaid. Whilst it becomes impractical for the collateral households to pay if the borrower defaults on payments, the system will exclude the collateral households from taking out a loan themselves, and/or, being a collateral household for another borrower until the initial loan is repaid. This community self policing system is simple and effective in keeping loan administration costs and interest charges very low. In order to entice bona fide micro lenders into these communities, an external loan guarantee fund will need to be raised to cover loan defaults.



# SITE DESIGN CONCEPT – FARMERS CO-OPERATIVE SUPPORT CENTRE

A key feature of this Farmers Co-operative Support Centre is the establishment of 3 polytunnels, on what is considered barren land (borrow pit), in order to ensure the economic viability of the overall scheme.



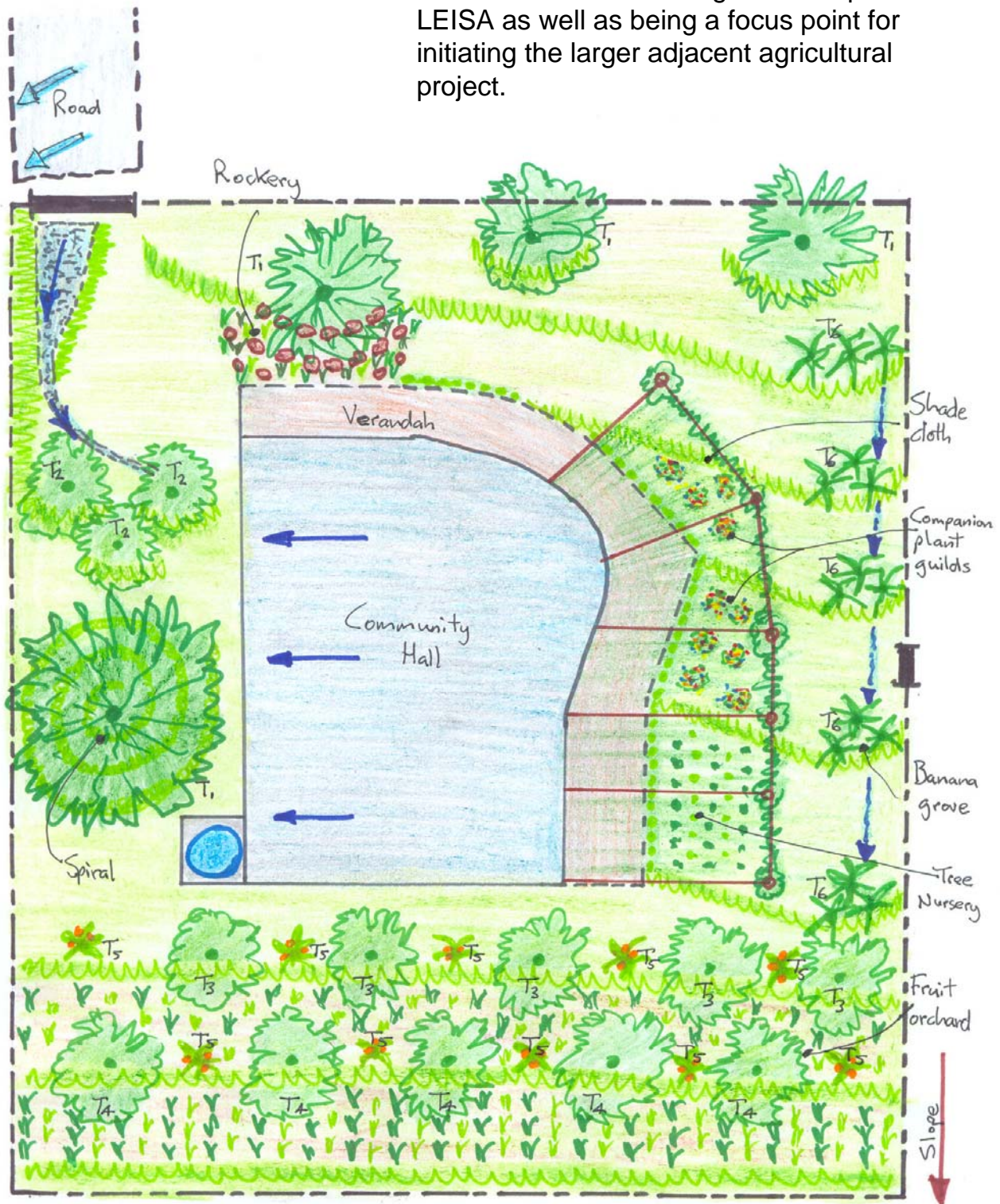
The scale of this project makes for a viable Farmers Co-operative Support Centre as an independent business unit in order to consolidate and deliver a wide range of functions, such as:-

- management and administration of allotments
- inspections for organic compliance
- administration of micro loans
- training and mentoring of farmers
- advisory services for farmers
- propagation of seeds and trees
- storage and exchange of seeds
- collection point for recycling of glass, paper and steel
- use of local garden refuse for large scale composting
- hiring of plant and equipment
- provide a trading platform on market days
- produce delivered for onward transport to other markets
- add value to niche produce such as packaging and marketing
- provide assistance to emerging SMEs



# SITE DESIGN CONCEPT – COMMUNITY HALL

A complimentary community hall has already been constructed on part of the project area and includes a small area under shade cloth for use as a nursery. A Permaculture design concept plan has been prepared for this hall which should then demonstrate some good examples of LEISA as well as being a focus point for initiating the larger adjacent agricultural project.



## Legend

- T<sub>1</sub> = Acacia
- T<sub>2</sub> = Mango
- T<sub>3</sub> = Avocado
- T<sub>4</sub> = Litchi
- T<sub>5</sub> = Pawpaw
- T<sub>6</sub> = Banana

 vetiver swales

0 1 2 3 4 5 metres 10

Scale

# PROJECT BUDGET

The detailed budget estimate includes all costs related for the establishment of some 50 allotments; a Farmers Co-operative Support Centre; and, 500 homestead gardens. The budget makes allowances for all costs required to undertake the entire project, including a 5% project administration fee for handling all the monetary transactions and VAT at 14%. It should be noted that the budget estimate is based on current prices which need to be continually escalated in accordance to the consumer price index.

The budget estimate of an all in cost of some R2,247,389 which translates to approximately R44,948 per allotment / urban farmer.

However, this budget includes the cost of the Farmers Co-operative Support Centre and 500 homestead garden, which can then be favourably compared to the government LRAD scheme whose entry level is R20,000 and has a maximum ceiling of R100,000.

The total number of beneficiaries will be at least the 50 allotment farmers plus 500 homestead growers, making a total of 550 beneficiaries at or above the poverty level for an investment of R4,100 per informal job opportunity.

Table 1 of 2

#	Task	Unit	Quantity	Rate	Sub-Totals	Bulk Unit Cost	Cost/farmer	%
<b>1</b>	<b>Project work plan</b>					<b>R 48,800</b>	<b>R 976</b>	<b>2.5%</b>
1.1	Development Concept Plan	hours	32	R 400	R 12,800			
1.2	Business Plan	hours	80	R 400	R 32,000			
1.3	Funding mobilization	hours	16	R 250	R 4,000			
<b>2</b>	<b>Training Learnerships</b>					<b>R 406,000</b>	<b>R 8,120</b>	<b>20.6%</b>
2.1	Basic Permaculture / organic farming course	trainees	50	R 1,600	R 80,000			
2.2	Basic rainwater harvesting course	trainees	50	R 1,600	R 80,000			
2.3	Animal Production Systems course	trainees	50	R 1,600	R 80,000			
2.4	Facilitators / organic inspectors course	trainees	10	R 1,600	R 16,000			
2.5	Trainee in-service maintenance payments	trainees	50	R 3,000	R 150,000			
<b>3</b>	<b>Farmers Co-operative Support Centre</b>					<b>R 360,608</b>	<b>R 7,212</b>	<b>18.3%</b>
3.1	Design & Procurement	sum	1	12.0%	R 32,208			
3.2	Nursery infrastructure	sum	3	R 30,000	R 90,000			
3.3	Supply plant material	sum	1	R 20,000	R 20,000			
3.4	Building (offices, hall, store rooms)	m2	120	R 1,200	R 144,000			
3.5	Fencing	m	180	R 80	R 14,400			
3.6	Site supervision	months	4	R 15,000	R 60,000			
<b>4</b>	<b>Planning &amp; design</b>					<b>R 31,200</b>	<b>R 624</b>	<b>1.6%</b>
4.1	Soil test pits	hours	16	R 1,000	R 16,000			
4.2	Detailed design	hours	24	R 500	R 12,000			
4.3	Site survey	hours	8	R 400	R 3,200			



# PROJECT BUDGET

Table 2 of 2

#	Task	Unit	Quantity	Rate	Sub-Totals	Bulk Unit Cost	Cost/farmer	%
<b>5</b>	<b>Site Infrastructure</b>					<b>R 339,810</b>	<b>R 6,796</b>	<b>17.2%</b>
5.1	Swales complete	m	1,200	R 30	R 36,000			
5.2	450mm Concrete pipes in check weir	m	2	R 800	R 1,600			
5.3	Check weir in river bed	m3	9	R 750	R 6,750			
5.4	Check weirs in gulleys	m3	2	R 750	R 1,500			
5.5	Excavate dam	m3	800	R 50	R 40,000			
5.6	Excavation to chanampas	m3	28	R 70	R 1,960			
5.7	Soil improvements	m2	20,000	R 1	R 20,000			
5.8	20ML Water tank	No.	1	R 20,000	R 20,000			
5.9	Irrigation pipes complete	m	1,500	R 50	R 75,000			
5.10	Borehole	sum	1	R 25,000	R 25,000			
5.11	Pump	sum	1	R 7,000	R 7,000			
5.12	Small tools	trainees	50	R 500	R 25,000			
5.13	Fencing	m	1,000	R 80	R 80,000			
<b>6</b>	<b>Plant Material</b>					<b>R 37,100</b>	<b>R 742</b>	<b>1.9%</b>
6.1	Seedlings	trainees	50	R 700	R 35,000			
6.2	Fruit trees	number	75	R 20	R 1,500			
6.3	Banana grove	number	120	R 5	R 600			
<b>7</b>	<b>Homestead gardens (500 No.)</b>					<b>R 239,000</b>	<b>R 4,780</b>	<b>12.1%</b>
7.1	Micro-finance loan guarantee fund	number	50	R 2,500	R 125,000			
7.2	Administration of loan finance	months	12	R 7,000	R 84,000			
7.3	Audit costs	number	2	R 15,000	R 30,000			
<b>8</b>	<b>Site supervision &amp; mentoring</b>					<b>R 205,000</b>	<b>R 4,100</b>	<b>10.4%</b>
8.1	Engineering supervision	days	10	R 2,500	R 25,000			
8.2	Farming supervision	months	6	R 15,000	R 90,000			
8.3	Farming mentoring	months	12	R 7,500	R 90,000			
<b>9</b>	<b>Project management</b>	months	21	R 10,000	R 210,000	<b>R 210,000</b>	<b>R 4,200</b>	<b>10.7%</b>
<b>10</b>	<b>Project administration</b>	%	1	5.0%	R 93,876	<b>R 93,876</b>	<b>R 1,878</b>	<b>4.8%</b>
	<b>Sub-Total Rands (ex-VAT)</b>					<b>R 1,971,394</b>	<b>R 39,428</b>	<b>100.0%</b>
	VAT @ 14%					<b>R 275,995</b>	<b>R 5,520</b>	
	<b>Total Rands</b>					<b>R 2,247,389</b>	<b>R 44,948</b>	

# PROJECT PROGRAMME

The envisaged programme has been scheduled over a 2 year period. This allows for a lead in period for preparing the project work plan and associated securing of resources. Thereafter, the training of urban farmers can commence together with the establishment

of site infrastructure and the Farmers Co-operative Support Centre. Once farmers have been trained and their allotments start to flourish, the homestead gardens can be established. Site supervision for 6 months is provided during the establishment of site infrastructure followed by a 12 month mentoring period to ensure that the allotments are fully developed; some 500 homestead gardens established; and, that the Farmers Co-operative Support Centre is a viable business unit and resource for the greater community.

#	Task	Budget (R000s)	2005		2006				2007			
			Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4
<b>A</b>	<b>Project work plan</b>	<b>R 49</b>										
A.1	Development Concept Plan	R 13										
A.2	Business Plan	R 36										
A.3	Update Business Plan											
<b>B</b>	<b>Allotments - (No.50)</b>	<b>R 1,019</b>										
B.1	Site design & survey	R 31										
B.2	Training	R 406										
B.3	Site establishment	R 340										
B.4	Plant propagation	R 37										
B.5	Site supervision	R 115										
B.6	Mentoring	R 90										
<b>C</b>	<b>Farmers Support Centre</b>	<b>R 361</b>										
C.1	Design	R 23										
C.2	Procurement	R 10										
C.3	Construction	R 158										
C.4	Agricultural infrastructure	R 110										
C.5	Site supervision	R 60										
<b>D</b>	<b>Homestead gardens (No.500)</b>	<b>R 239</b>										
D.1	Secure loan guarantee fund											
D.2	Establish 500 gardens	R 125										
D.3	Loans administration	R 114										
<b>E</b>	<b>Project Management</b>	<b>R 210</b>										
<b>F</b>	<b>Project Administration</b>	<b>R 94</b>										
	<b>Sub-Total</b>	<b>R 1,971</b>	<b>R 13</b>	<b>R 38</b>	<b>R 258</b>	<b>R 606</b>	<b>R 400</b>	<b>R 279</b>	<b>R 141</b>	<b>R 118</b>	<b>R 118</b>	<b>R 0</b>
	<b>VAT</b>	<b>R 276</b>	<b>R 2</b>	<b>R 5</b>	<b>R 36</b>	<b>R 85</b>	<b>R 56</b>	<b>R 39</b>	<b>R 20</b>	<b>R 17</b>	<b>R 17</b>	<b>R 0</b>
	<b>Quarterly cash flow (R000s)</b>	<b>R 2,247</b>	<b>R 15</b>	<b>R 43</b>	<b>R 295</b>	<b>R 691</b>	<b>R 456</b>	<b>R 318</b>	<b>R 161</b>	<b>R 134</b>	<b>R 134</b>	<b>R 0</b>
	<b>Cumulative quarterly cash flow (R000s)</b>		<b>R 15</b>	<b>R 58</b>	<b>R 353</b>	<b>R 1,044</b>	<b>R 1,500</b>	<b>R 1,818</b>	<b>R 1,979</b>	<b>R 2,113</b>	<b>R 2,247</b>	<b>R 2,247</b>