No. 4 November, 2011

Robin's Nest GLOBAL CHILD FOUNDATION INC

infosheet

The Dairy Project: Janet & Neil Sloan

In the works: more self-sustainability

5 yr lease:education dairy farm & crops

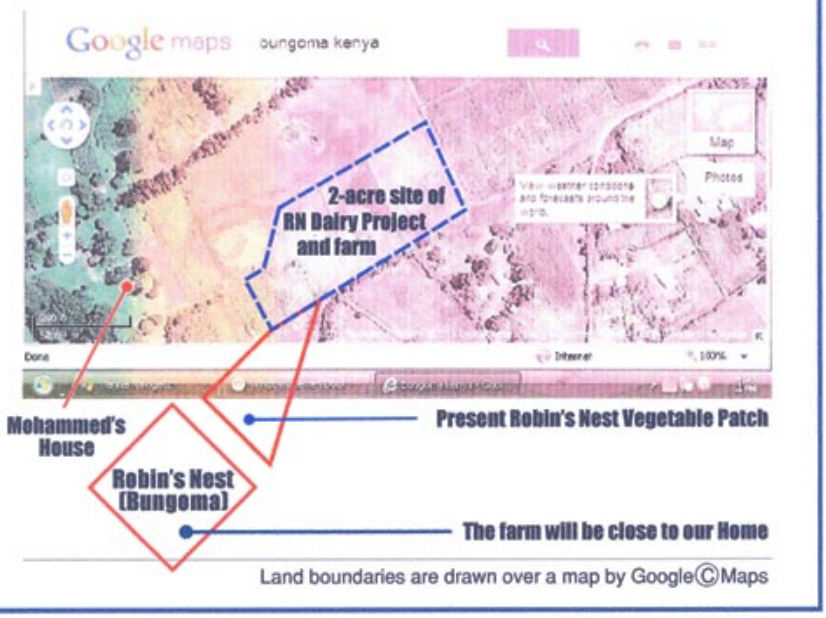

FIGURE 1: We have signed a contract to lease a 2-acre block near our property for 5 years. Now we can continue cultivating maize and other crops, run animals and start a dairy farm

Janet and Neil Sloan first met studying Agriculture and Horticulture. Their background of over 20 years in farming methods includes: Janet having lectured in dairy farm management, practiced as a field officer for a dairy factory and been a Dairy Extension Officer for the Victorian Dept. of Primary Industries. They also own a native plant nursery which grows trees for revegetating farm lands. We thought this kind of experience made them ideal people for investigating several ways to help our African Home become more self-sustainable. Among our main aims in Bungoma is self-sufficiency through the production of our own food. To set the foundations, we encouraged Janet and Neil to sign a contract confirming the lease of an area of 2 acres near our Home (cf: Fig. 1), for the next 5 years, from its 23-year-old farmer-owner Mohammed (cf: Fig. 2). He will be happy to receive $70.65 per month for his land, money which can now help him to finance his own long-held dream of studying law.

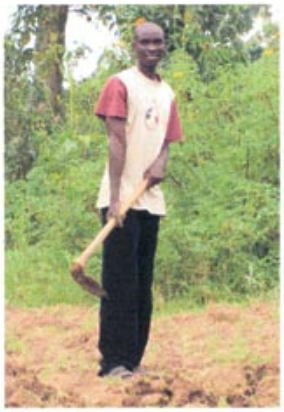

FIGURE 2: Mohammed, the land-owner He can now afford to study law at University

The land lease allows us to plant food crops for the children, establish a small dairy farm and utilise dairy cattle waste through a biogas digestor. Eventually, with enough funding, we hope to establish a milk-processing plant. To help prepare the field for our next crops,

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Lease: crops, cows biogas, milk-cooling

Mohammed and some neighbours have already ploughed it, using his very traditional oxen and plow (cf: Fig. 3), and the 2-acre field will soon be fenced using 5-strand barbed wire, then latched with wire and wooden gates.

Part of our extended "farm" has already grown maize and napier grass, which will be two of our main crops in future years. Maize, known to many English-speakers as corn, was introduced to Africa

FIGURE 3: Mohammed's plow in action. We will be growing more crops on this plot

FIGURE 4: Harvesting our previous crop. We've grown maize and napier grass already

by the Portuguese in the 16th century and has, since then, become this continent's most important staple food crop. Grown from

Maize: staple food in Kenyan diet

FIGURE 5: Our harvest cut and peeled Maize cobs are then gathered for shelling

FIGURE 6: Shelling maize cobs after they were collected. Many hands make light work

seed, it usually matures in 3-4 months, depending on whether a "short" or "long" season variety is sown. Season lengths here refer to Kenya's two annual rainy seasons. If a long-season maize has been growing, farmers can

FIGURE 7: Janet's silage class in progress Some farmers travelled a long way to attend

Maize: short or long-season crops?

expect higher yields and one or two edible cobs per plant. As Bungoma receives up to 2.5 metres of rain annually the maize plants' short roots have caused few problems.

When grown, our maize crops were harvested (cf: Figs. 4-5) using a panga, a type of machete about 16-18 inches long, then its cobs were snapped off, peeled and shelled on

FIGURE 8: Classes began cutting napier. Note the different lengths grass is being cut to

FIGURE 9: Leaf and soft storks squashed to start drying, cut to 4 cm lengths, left to "wilt"

the verandah (cf: Fig. 6). Children helped to shell maize by hand, using a knife to flick the first row of kernels off. Unripened maize cobs

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Maize: roast, plant preserve or grind

can be roasted, tasting a little like our sweet corn. The majority of kernels are preserved using a pyrethrum-based dust, to kill weevils. Usually maize kernels are crushed, once hardened, to make a flour (or cornmeal). Maize flour is then cooked with water to make a porridge or dough-like "ugali",

FIGURE 10: Pius Bittonyake interpreted and made sure everyone had a few laughs

FIGURE 11: Farmers were very keen, with plenty of questions. Some also took notes

the most regularly consumed starch of much of Eastern and Southern Africa.

Napier grass is an important staple feed for dairy cattle in Kenya. We plan to use napier grass as a major feed source for the dairy project. Janet conducted

Silage: cut, chop, wilt, sugar and bury

a very informative silage-making class for the local community with the help of Pius Bittonyake, a member of our Advisory Committee, who interpreted (cf: Figs. 7-16). Silage making is a way to conserve excess grass to the

FIGURE 12: Janet explaining importance of sealing pit; silage must ferment with no air

FIGURE 13: Molasses sprinkled on silage Its sugar enables silage to ferment effectively

FIGURE 14: Compressing to remove air. Plastic sheets will help silage pit stay airtight

Silage: cover, then ferment without air

cattle's daily needs, so that the food does not get wasted and allows for further regrowth. This ensures we have plenty of quality feed during the dry season while growing the most amount of top quality feed during the growing season.

FIGURE 15: Chopped grass is sprinkled with more molasses as the pit is gradually filled

FIGURE 16: Then pit is covered. Silage can ferment for 3 weeks, then it will be ready for use

Ensiling napier grass involves cutting and wilting the grass, adding molasses then compressing it in a pit to remove air. The ensiled grass ferments over 3 weeks to make a very stable type of pickled grass. If air is allowed into the silage it rapidly becomes mulch and very unpal-

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Nutritious fodder; napier helps maize

atable to cattle. Grass can also be conserved by making hay. However, hay needs to be wilted much longer (2 days) and stored in a dry place (ie: the shed). During the rainy season 2 days without rain is very rare, making this process unpractical.

Napier can also use its own chemicals to attract stem borers (these are insect pests) even more strongly than they are att-

FIGURE 17: Establishing napier. Hard-working local ladies planting napier canes

racted to their regular prey (for example: maize crops). The napier then secretes a sticky sap to trap and, usually, kill insects' larvae. So the practice of planting napier grass near or around maize crops can be mutually beneficial, and is becoming more common in Kenya as communities are being educated.

The "Dairy Project" will help our self-sustainability since, by raising dairy cattle on the new farm, our Bungoma Home's children can

Surplus milk: for sale to neighbours

FIGURE 18: Then, farmers headed home to spread the good news about silage making

FIGURE 19: Neil assured Neil his future is secure if he feeds silage to his father's cows

FIGURE 20: and dairy cattle in Kenya can smell good silage from as far as a kilometre off

have a regular supply of milk. So our expenses can be cut considerably. When we can raise enough funds, we hope to construct a milk-cooling plant onsite; meanwhile neighbours will come to us to buy any surplus milk we pro-

Cow shed is being built for three cows

duce. Eventually, sales of our own excess milk will raise enough money for other resources, and in the process our children can learn to budget, save and learn some basic dairy farming skills.

For the moment, Janet has recommended buying two cows, until our pastures are better established. She is not over-concerned about breeding as long as they are dairy cattle of good production. Extreme-

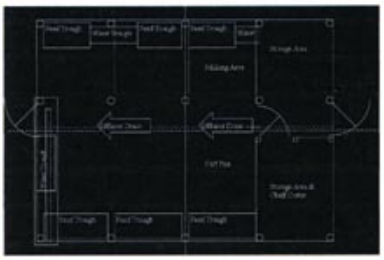

FIGURE 21: Floor plan of our new cow shed
This floor plan has been drawn by Neil Sloan

ly good cattle can die too easily here, and need too much maintenance for our long-term sustainability objectives. We expect to hire farm workers for two to three months to set the dairy component up, which will include building a shed for the cows (cf: Fig. 21).

The Bungoma block has a drain and a semi-permanent spring, but our farm's main water supplies will be a hand-dug bore hole, with a tank, to pump the water. Our cows will drink from a trough. Several

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We grow crops to enrich soil fertility

Plant: produces gas for cooking

and bio-slurry: more fertile than manure

extra drains have been dug and can act as rough irrigation in the dry, but their main purpose will be to remove water, as average annual rainfall is over 2 metres. Janet has also recommended daytime grazing for the cattle, which will be tethered in the shed after dark. Here they will only need about 4 hours sleep, since

FIGURE 22: Biogas distributor. These can break organic waste down by microorganisms

they spend much of even their night-time hours eating and re-gurgitating.

We can also enrich silage by choosing crops that supplement each other, which will help replenish soil fertility. One way we can do this is by growing plants that can improve the protein content of existing feed. Desmodium (a flowering plant) works well if mixed with napier grass. We grow Desmodium, which also fixes nitrogen in the soil. Excellent protein sources can be extracted from fodder trees such as Calliandra, Sesbania and Lucaena. When mixed with

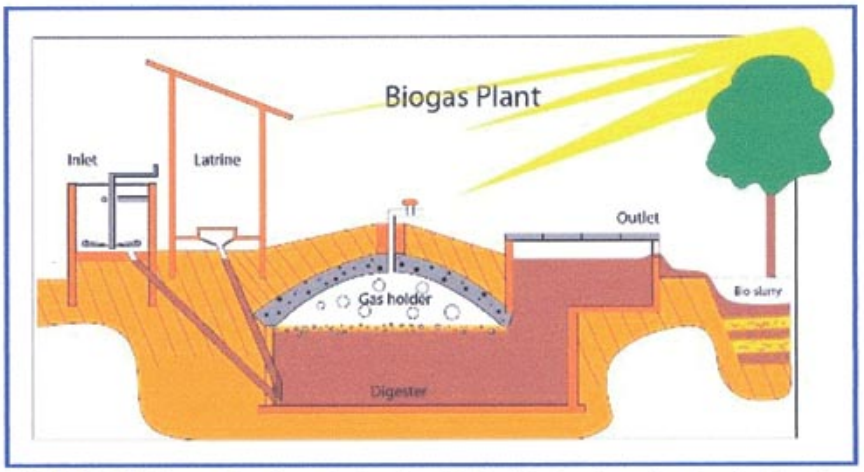

FIGURE 23: Biogas Plant Cross-Section (from *Wikipedia*). Organic waste enters tank for micro-digestion; methane is extracted at valve on top; leaves at outlet to fertilise crops. It is nutrient-rich

fodder or ploughed back into the soil they improve its nitrogen content.

Another sustainability project we are starting is a biogas distributor (cf: Fig. 22). This improves soil fertility as well, and is a great boost for dairy farms. Biogas is gas produced when organic material is broken down by microorganisms *anaerobically* (without oxygen being present). For our purposes, organic waste such as animal dung or even sewage can be converted by microscopic digestion to a fuel gas (or biogas). Since a main component of biogas is methane, combustible with oxygen, it means that once biogas is collected and stored safely we can use it as a fuel. One way to collect it is in a biogas plant.

The biogas plant is basically a 6,000 litre concrete tank which has a domed underground roof with a pipe to take methane gas from it (cf: Fig. 23). There are places for putting manure or sewage into the plant and a place for digested manure to come out. Only low pressure is involved, and our main use for the methane gas will be for cooking. Digested manure, or bio-slurry, taken from the plant is nutrient-rich and the manure-fermentation process kills all germs and weed seeds. Therefore, it will be a much better form of fertiliser than raw manure.

If you'd like to support our Dairy Project, see the next 2 pages. All will begin over the next few months.

Until the next time ...

Robin & the Team

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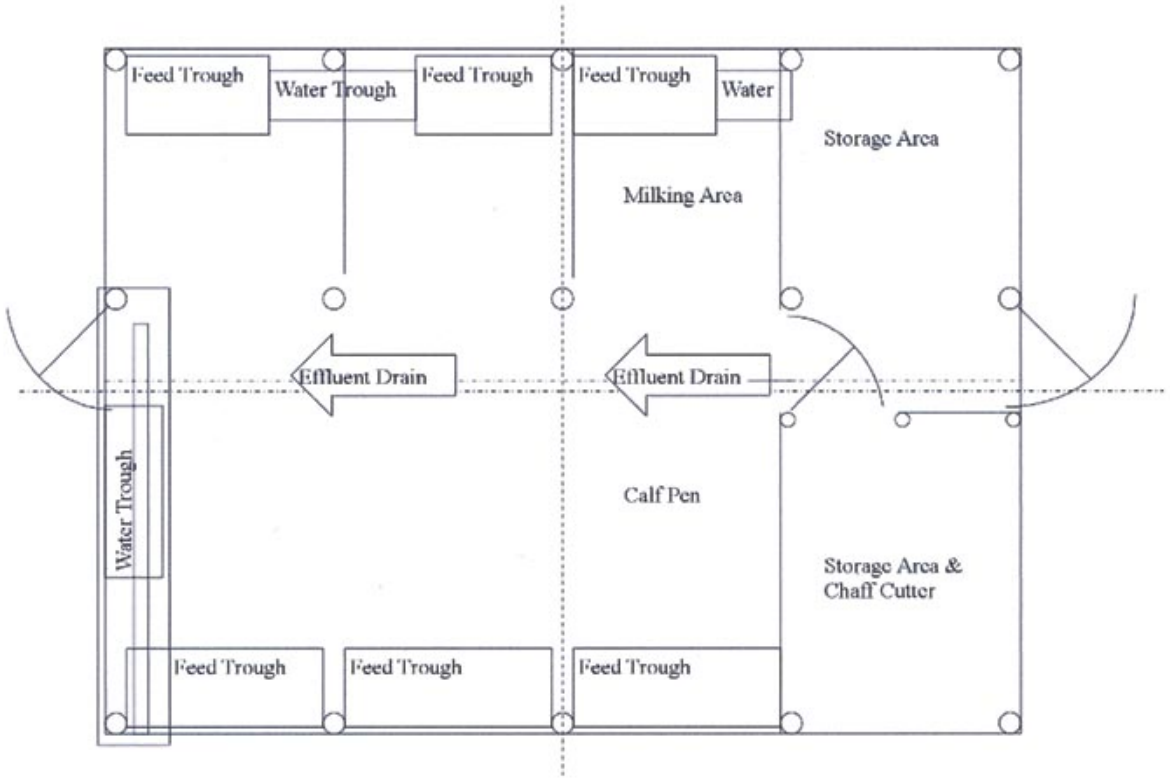
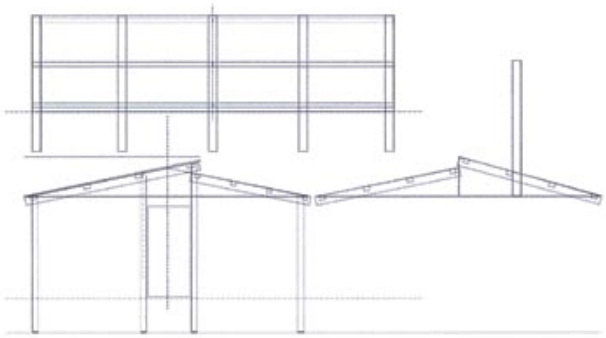
Robin's Nest (Kenya) Dairy Project : Plans for the Cow Shed

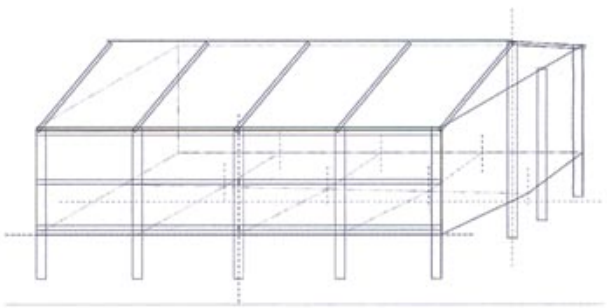
by Neil Sloan



FLOOR PLAN



SIDE, BACK + FRONT VIEW



PROJECTED VIEW

ALL 3 PLANS DRAWN BY NEIL SLOAN

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Cost Estimates for RN (Kenya) Dairy Project establishment

by Janet Sloan

KSH = Kenyan Shillings. 100 Kenyan Shillings = 1.18 Australian Dollars ($1.18) : 16.12.11
Conversions are subject to Exchange Rates. Usually 1 KSH is between 1 to 1.5 Australian cents
Note: this budget is for initial starting up of the Dairy Project only.

ITEM	KSH	AUD	COMMENTS
Lease	6,000	70.65	Per month. Total lease : 5 years +
Worker's wages	10,000	117.74	For 50 days work. 2-3 months likely
Cattle purchase	160,000	1,883.50	2 cows, transport, med., extras (calved)
Plowing	15,000	176.57	One row of entire farm
Seeding	10,000	117.74	Once to establish pastures
Fertilising	2,000	23.55	One application : establishing pastures
Fencing	200,000	2,350.40	5-strand barbed wire, wooden gates
Fodder trees	10,000	117.74	Calliandra, Sesbania and Leucaena
Cow shed	80,000	941.75	6m (W), 8m (L), 2m (H). Plans: page 7
Chaff cutter	28,000	329.24	Hand operated machine
Water supply	100,000	1,175.20	Hand-dug bore, pump, water tank
Biogas Plant	50,000	588.70	c 6,000 litres. See page 5 for details
TOTAL	**671,000**	**7,892.78**	

View of farm land surrounding Robin's Nest (mid frame) and Patience, one of our robins who made it to the top

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