LINKING AGRICULTURE AND ENERGY IN CAMBODIA

This series of case studies is part of a project to emphasise the energy-agriculture nexus in smallholder and small-scale commercial farming.

SMALL-SCALE COMMERCIAL BROILER FARMER

Province: Takeo

Farmer's ID card

Name: Mr. Thol Sitha
Connected to grid electricity: since 2016
Main source of income: chicken production
Industry segment: broiler (produced for their meat)
Allocated land: 0.03 ha
Production capacity: 2,500 chickens/cycle
Production cycles per year: 7 cycles
Duration of each cycle: 1.5 months (hybrid species versus 4-6 months for local species)

Context

In Cambodia, local chicken production is the second largest source of income besides rice for most farmers in rural areas. As of 2015, 57% of the households (more than 1,8m of families) were involved in livestock and poultry production, chicken raising accounting for more than half. There are nearly 618 commercial broiler farmers like Mr. Sitha and they generally use hybrid chicken species, but small-scale farmers using local species still account for 85% of the chickens' production. Farmers can either grow the chickens for their eggs, sell small chicks to middle-sellers or grow chickens for their meat.

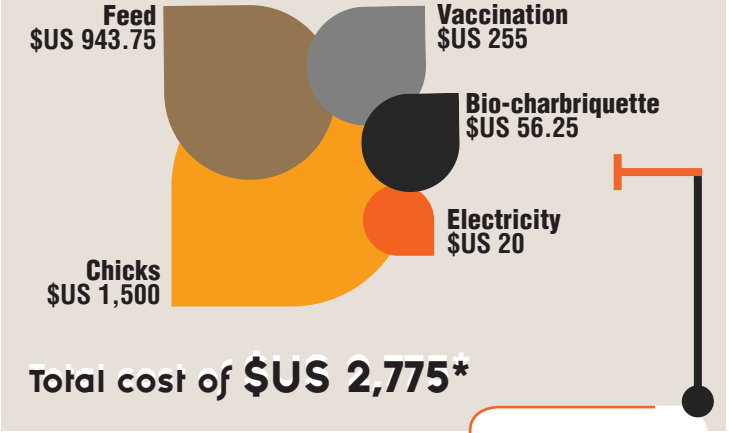
Earnings & expenses

By production cycle, Mr. Sitha produces 3,350 kg of meat, which he sells at $US 1.8 per kilogram. Using KGC (formerly SGFE) bio-charbriquettes – and after deduction of the price of the chicks, vaccination, feed and energy-related costs, he can earn up to $US 3,255 as net profit for each production cycle and $US 22,785 per year.

Raising chickens involves feeding them but also keeping them warm enough, giving them water, getting them vaccined and doing regular health controls. Expenses are thus diverse and depends on the energy sources, uses, the available technologies, the production size and duration of the cycles.

Mr. Sitha's expenses splitting

(per cycle)



Total cost of $US 2,775*

One of the biggest expenses for most farmers, including Mr. Thol Sitha, is the feed for chicks. For each production cycle, this farmer will spend nearly $US 1,000 to feed the animals. However, his biggest expense remains the baby chicks, which he buys at the beginning of each new cycle.

$US 534 per year

=

energy-related expenses for chicken farming

**The maintenance and initial investment costs for the charcoal stoves are not included in the calculations. Only regular expenses are included.*

Zoom in:
Mr. Sitha's energy profile

During the first two weeks, a newly hatched chick needs help to maintain its body temperature (either artificially or naturally). Usually, farmers in Takeo province use powerful light bulbs (125W) or stoves with traditional charcoal to heat the chicks.

Energy for heating: systems' comparison

BEFORE

Clay Stove

+

Traditional charcoal

=

350 kg of charcoal used per cycle

High cost per cycle:
$US 105

Mortality rate per cycle:
15%

AFTER

Clay Stove

+

KGC's green charcoal, made from recycled coconut shell

=

150 kg of charcoal used per cycle

Cost per cycle reduced almost by half: **$US 56.25**

Lower mortality rate per cycle:
8-10%

For each production cycle, Mr. Sitha was able to make an energy saving worth $US 48,75 while reducing the mortality rate of his chicks and therefore getting additional revenue.

"I had bad experiences with traditional charcoal. Five months ago, six of my chicks were burned by charcoal sparks. Traditional charcoal was indeed cheaper than green charcoal but it was not producing heat long enough and more of my chicks died."

Mr. Thol Sitha

≈5%
chicks saved per cycle (125)

$US 292
additional revenue from the saved chicks

2-4X
longer heat duration

$US 341
yearly savings using green charcoal

100%
less risky for the chicken (no ash, spark, or risk of burn)

but...
it takes longer to start heating

Other energy-related sources needed

Electric water pump (40W)
used 10 min/day
Provides water to the chickens, the household and for vegetables

+

3-5 light tubes (25W)
used 24h/day

+

1 speaker (25W)
used 2h/day

100 kWh/cycle
electricity cost per cycle: $US 20

Which opportunities for the farmers?

More than 90% of Cambodian households rely on woody biomass for cooking. In rural areas, fuelwood is collected from forest lands close to villages, and charcoal is bought from illegal, inefficient kilns. The high rates of deforestation caused by use of traditional biomass will lead to shortages of fuelwood but also soil degradation and agricultural lands impoverishment. The char-briquettes used by Cambodian farmers are sold by KGC (Khmer Green Charcoal, formerly SGFE), a social enterprise producing innovative char-briquettes from recycled biomass waste. 1kg of KGC charbriquettes can replace 1.1kg of traditional wood charcoal, saving up to 6.6kg of wood. Promoting green charcoal among farmers in Cambodia has the potential to drastically decrease the costs per production cycle, not only for chicks' producers like Mr Sitha, but also for eggs, ducks and other chickens' producers.

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