Opportunities & Challenges for Solar Egg Incubators in Cambodia



SWITCH to Solar

switchasia GRANTS PROGRAMME

Funded by the European Union

CZECH REPUBLIC DEVELOPMENT COOPERATION

sevea

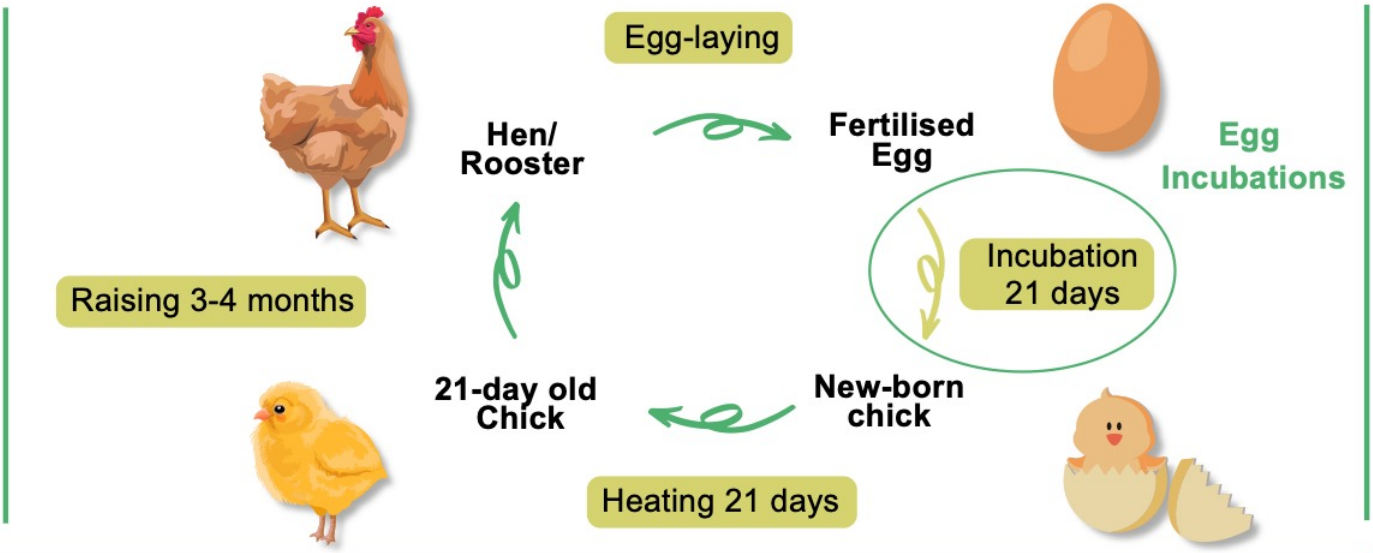
(Energy)Lab

In recent years, Cambodia's electricity sector has been through outstanding improvements fuelled by the government's success in rapidly expanding access to grid electricity up to 81% of households at the end of 2020. Nonetheless, in light of the relatively high electricity costs, remoteness of farmers and overall low mechanisation of the agriculture sector, solar technologies for productive use have the potential to improve agri-fishery MSMEs competitiveness on the market while reducing their operational costs. This summary provides a short overview of the opportunities and challenges for the adoption of solar egg incubators in Cambodia

Starting by looking at the use of egg incubators technologies at large…

As opposed to other technologies for productive use which can be used across value chains, such as water pumps, dryers or cold storage, egg incubators are specific to one value chain: the poultry value chain. Even more specifically, within the poultry value chain, only chick producers can be considered potential targets for egg incubator, whether smallholder farmers or commercial farmers.

Egg Incubators facilitate the incubation stage for chick production. By controlling the environment surrounding the eggs, it creates the perfect conditions for an egg to incubate and hatch successfully.



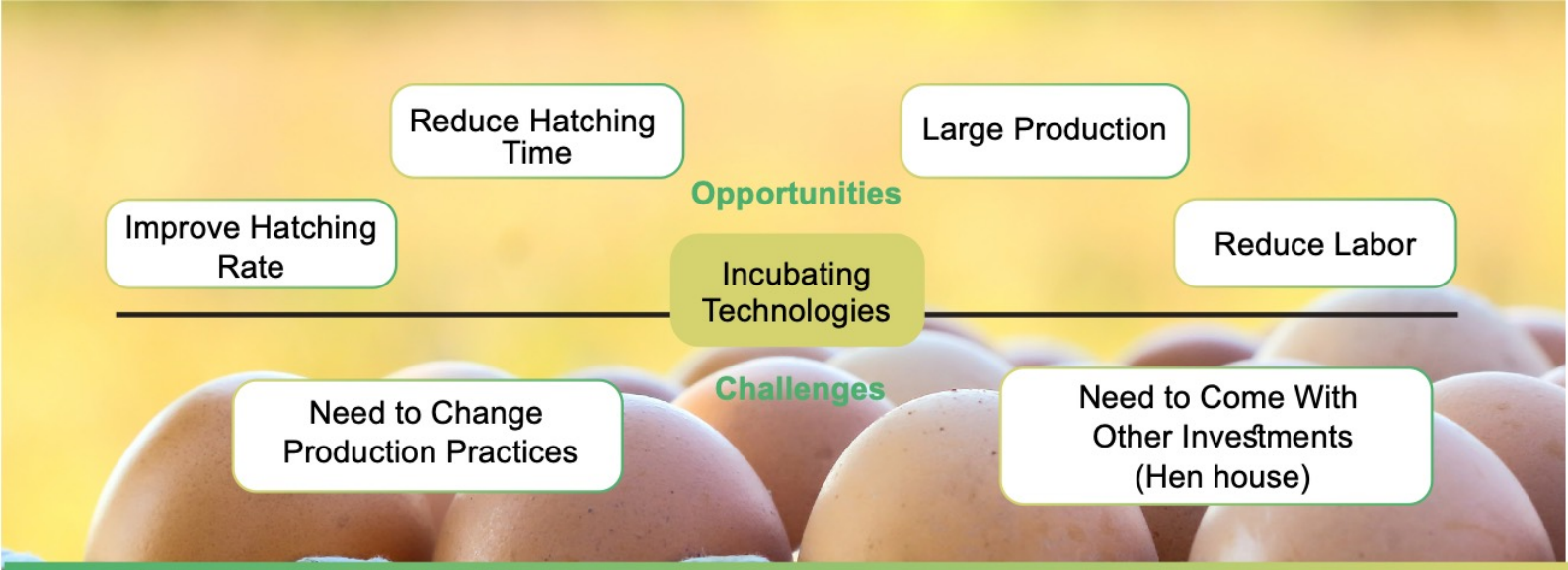
For this reason, they hold many benefits that can positively influence the uptake of incubating technologies:

- Improve hatching rate & Reduce hatching time
- Large production: an egg incubator is particularly beneficial for large production for which it would be close to impossible to manage natural hatching and incubation by the hen.
- Reduce labor: traditional hatching requires a lot of human intervention to ensure that the hen's behaviour allows maximum hatching, while an egg incubator is far less labour-intensive

Yet, there are challenges that need to be considered as they might constrain the adoption of the technology:

- Change in production practices: for the farmers relying on traditional hatching, switching to egg incubators requires a big change in the management of the hens and eggs
- Need for parallel investments: egg incubators make less sense if they are not paired with other investments to increase the overall production capacity and performance, in particular a hen house

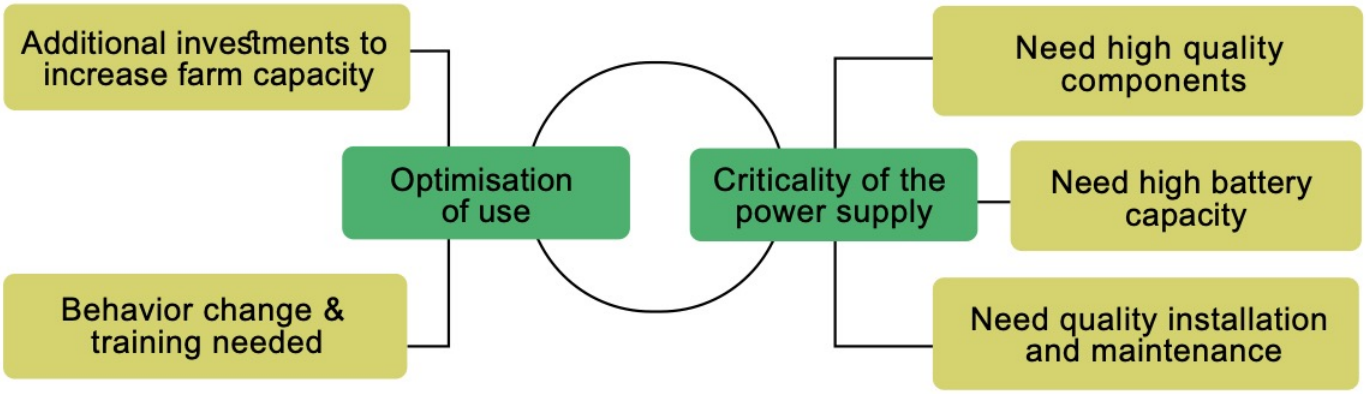
Overall, investing in incubating technologies has many advantages and has **potential for both smallholder and commercial farmers.** It makes **even more sense for commercial farmers** as they handle large productions and have the **investment capacity** for the technologies and other associated investments.



Technical considerations

Solar Egg Incubators have the advantage of being a mature technology already distributed by several suppliers in Cambodia and simple to install – mostly plug and play. There are different models available on the market ranging in capacity from around fifty to several hundred eggs, making them adaptable to the needs of the end-users.

Nonetheless, current incubation practices associated to the own limitations of solar egg incubators reveal 2 main technical constraints to the adoption of the technology: the criticality of the power supply since incubators need to provide power 24h/day, and the need to optimise the use of the incubator requiring behaviour change and training of farmers.



Another constraint to the adoption of solar egg incubators is their **upfront costs:** purchasing cost is between 2 to 5 times higher than the ones of grid-powered or hybrid technologies of the same size.
As such, they will be more affordable for stakeholders with higher investment capacity like commercial farmers.

Capacity	Electric	Hybrid	Solar
100 eggs	$200	$400	$750
500-600 eggs	$500	$1,500	$2,500

Nonetheless, it is important to note that solar egg incubators allow for great savings in operational costs (no electricity expenses) and can thus be interesting for smaller stakeholders as well, especially those in areas where the power supply is inconsistent. If the payback periods of solar egg incubators are very interesting for both smallholder and commercial, end-user financing mechanisms are still important to facilitate the uptake of solar egg incubators by stakeholders with smaller investment capacity.

Recommendations – How to be successful in distributing Solar Egg Incubators?

The poultry value chain is one of key interest for Cambodia. There is a real need to improve yields and help farmers increase their income in an economically and environmentally sustainable way, reason for which egg incubators hold great potential. Yet, there are challenges to overcome to be able to develop such a solar powered solution at scale. Here are a few recommendations to increase the adoption of solar egg incubators in Cambodia:



- It is beneficial to create **synergies** between actors with expertise in energy and actors with expertise in poultry brooding to encompass the full spectrum of knowledge needed to distribute solar egg incubators.
- Quality installation and maintenance are needed to ensure the added-value of solar egg incubators, meaning technology providers should offer **warranty** and **quality after-sale services.**

- For those using traditional hatching (mainly smallholder farmers), switching from traditional hatching to solar egg incubator requires significant **behaviour change** in the management of the production.
The distribution of solar egg incubators needs to be paired with **training of smallholder farmers** to ensure the benefits of the technology are maximised.

- Similarly to Solar Home Systems, solar egg incubators **require a large and well-established distribution network.** For those not able or not willing to establish such a distribution network, it is recommended to **establish partnerships** with NGOs, cooperatives, associations or development programs with strong local networks to **test innovative distribution models** whereby the partner would help in the identification of end-users. Working with intermediaries is also key as they can **help facilitate the acceptance of the technology** by acting as models and advertising, not only the economic aspects of solar egg incubators, but also other benefits. Launching **awareness campaign online** through digital marketing would also be an efficient way to increase the knowledge on the benefits of egg incubators.

- Solar egg incubators can be interesting for both smallholder and commercial farmers. Still, it is recommended to focus first on the stakeholders that have **higher investment capacity** and need less behaviour change, such as commercial farmers.

- In all cases, it is important **to introduce end-user financing mechanisms** to mitigate the high upfront costs of the solutions. It can be done through partnerships with MFIs, the provision of partial subsidies for smallholder farmers, simple financing mechanisms by technology providers themselves (payment terms), or more innovative models such as leasing or PayGo systems.



SWITCH to Solar

For a Thriving Agri-Fisheries Market

This document is produced as part of the SWITCH to Solar Project, funded by the European Union and the Czech Republic, and implemented by three partner agencies: People in Need, EnergyLab and Sevea. The goal of this document is to present the results of the study led by Sevea on the opportunities and challenges for solar cricket incubators in Cambodia.
The author of this summary is Sevea.

Website: www.switchtosolarkh.org
Email: info@switchtosolarkh.org

: SWITCH to Solar

SWITCH to Solar
switchasia GRANTS PROGRAMME
Funded by the European Union
CZECH REPUBLIC DEVELOPMENT COOPERATION
sevea
(Energy)Lab