

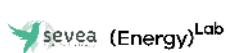
SWITCH to Solar Project

Solar Cricket Incubator –
Summary of Market Study Results



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Presenting SWITCH to Solar



Mission: Adding value to the Agri-fishery market by supporting the uptake of solar technologies for productive use to improve competitiveness and resilience.

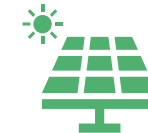
Focuses on:



5 Provinces around the Tonle Sap Region



8 value chains (rice, horticulture, aquaculture, poultry, fruit tree, cricket, pig, cattle)



10 selected solar technology solutions

A few targets:



9000 Agri-Fisheries MSMEs



20 Solar Technology Suppliers (Local and regional)



15 Financial Intermediaries/institutes

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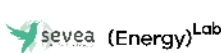
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SWITCH Market Study - Deep-Dive Analyses

- As part of the SWITCH to Solar Project, Sevea conducted Deep-Dive Analyses of 10 solar technologies to understand:
 - how each application/solution works in detail
 - how they can be integrated into the value chains
 - which stakeholders shall be targeted
 - the sales potential and under which distribution and commercialization model the technology would make the most sense
- Based on extensive field-data collection and interviews with stakeholders

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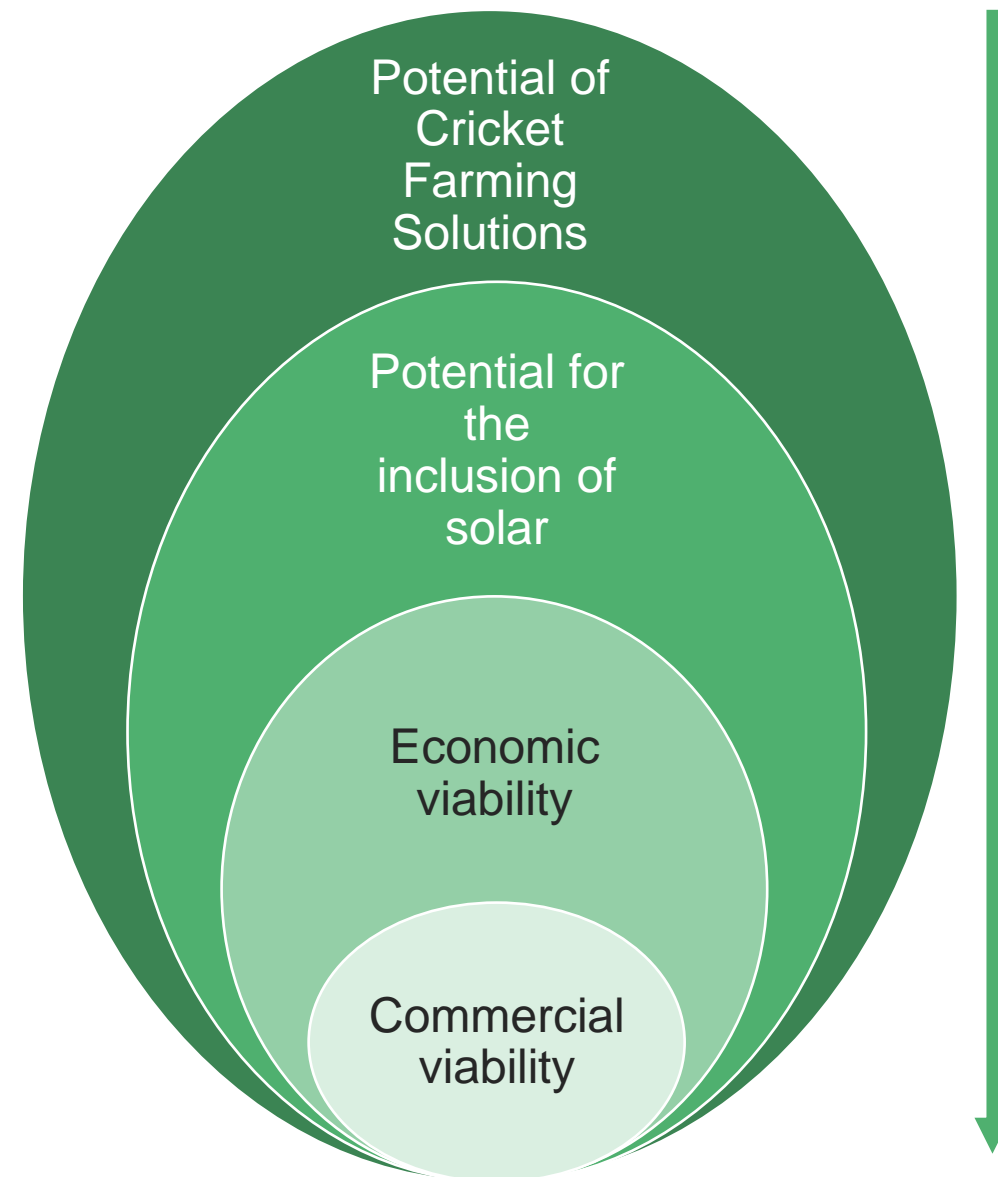
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Deep-Dive Analyse

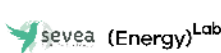
- 4-level analysis:



Opportunities and Challenges for Solar Cricket Incubators in Cambodia

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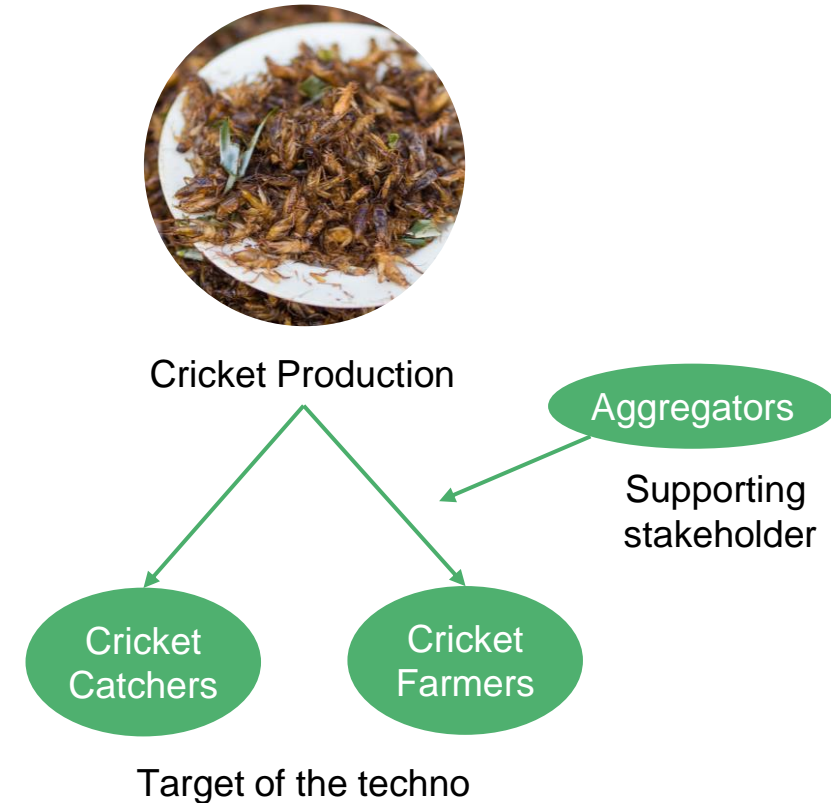
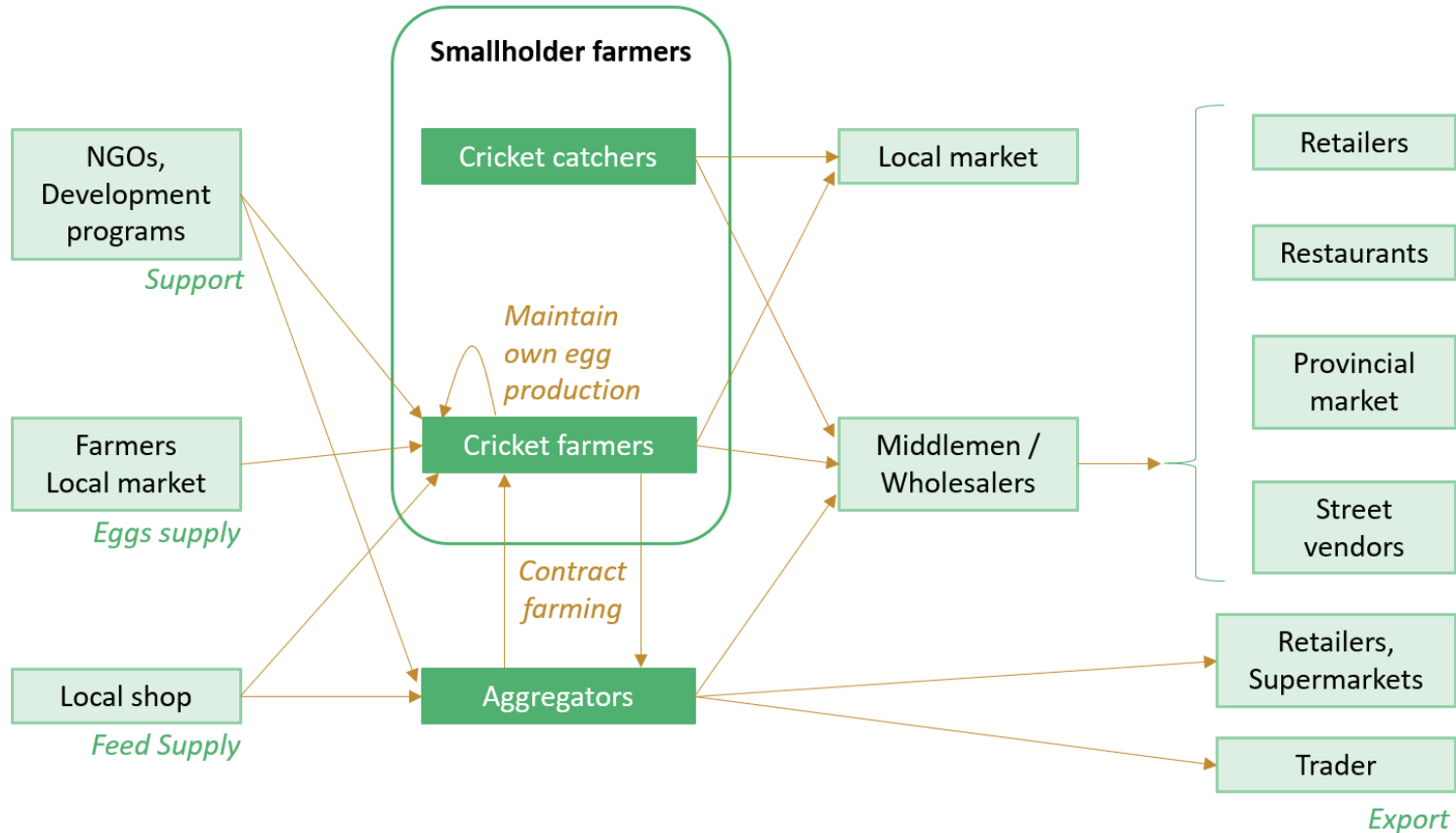


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Cricket Farming: a recent practice



Opportunities

Improve sustainability

Less dependence on seasonality

More control over the production

Additional source of income

Cricket Farming

(as opposed to cricket catching)

Challenges

Lack of knowledge and technical know-how

Strong volatility of cricket prices

More time consuming and rigorous than cricket catching > competition with other farming practices

Investing in Cricket Farming Technologies is a good way for smallholder farmers **to diversify their income**. It has a good potential for **cricket catchers wishing to switch to cricket farming** and for **cricket farmers wishing to invest in more developed technologies**.

Technological considerations: cricket production methods

Cricket catching traps

Benefits: passive yet effective, inexpensive, high yield for limited work

Constraints: very seasonal, no control, high energy consumption, need to replace lights often, high impact on environment & biodiversity

Cricket Incubator

Benefits: controlled and sustainable production, yearly production

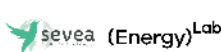
Constraints: daily work necessary, lack of technical know-how, high mortality rates

Solar Cricket Incubator

- A solar cricket incubator is a cricket incubator with a temperature regulation system powered by a photovoltaic solar system 24 hours a day.
 - Reduced mortality of crickets compared to traditional cricket incubators.
 - Production extended even in significantly cold and hot weather.
 - Reduced labour work by automatizing the temperature control.
- No established STP, as the overall sector of cricket farming is still in its early development
- Prevalence of ‘homemade’, ‘tinkered’ systems put in place by aggregators

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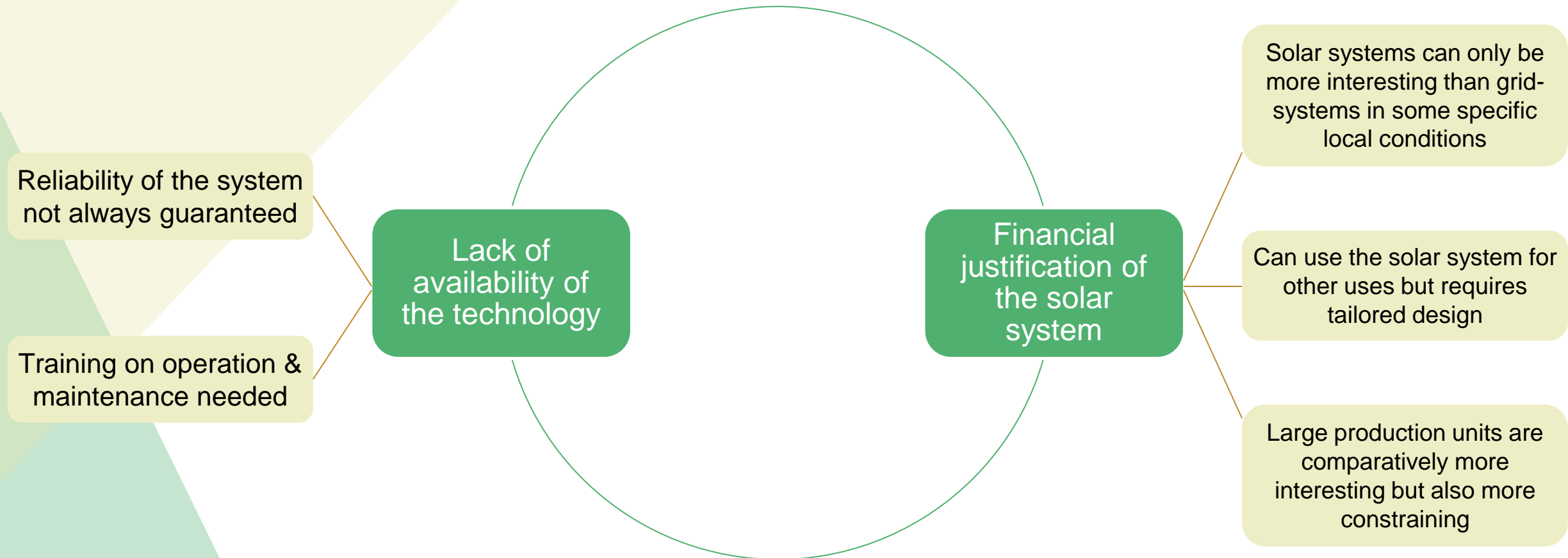


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Technical Constraints



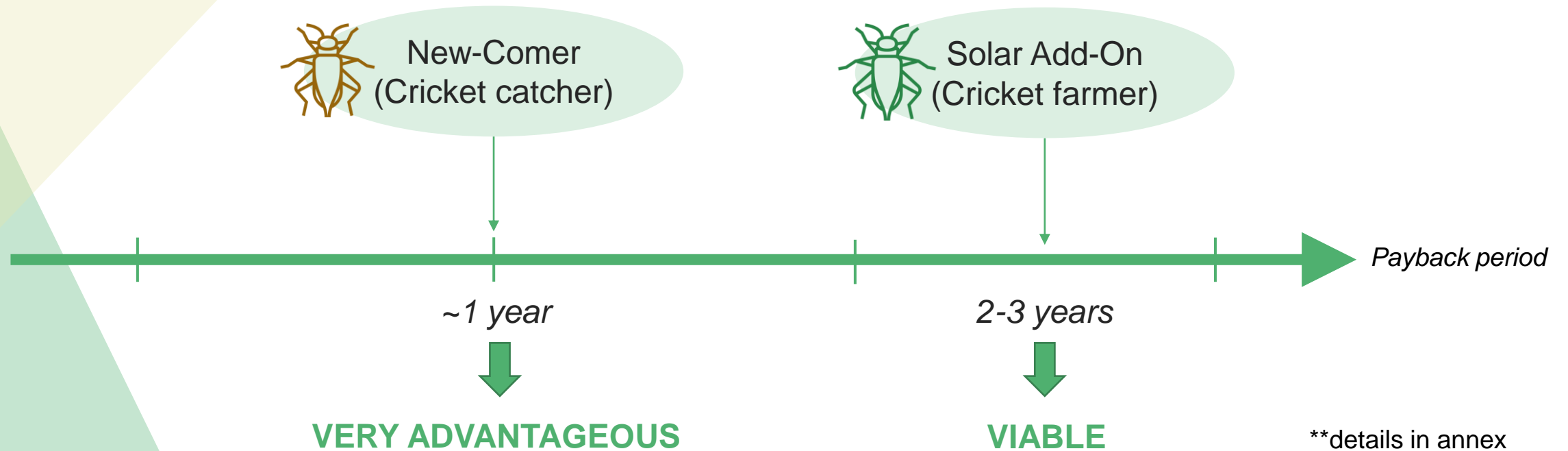
Economic viability

As cricket farming and cricket incubators in general are very recent in Cambodia, solar technologies are surprisingly not much more expensive than other technologies

Capacity	 Traditional (usually homemade)	 Electric	 Solar
50kg	\$800	\$500	\$600
100kg	N/A	N/A	\$1,000

Economic viability

To understand the economic viability of a solar cricket incubator, it is important to look at the payback period for a 'newcomer' and for a cricket farmer who would simply add solar to an existing cricket incubator:



**details in annex

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Conditions for economic viability

- Several risks to mitigate:
 - Volatility of retail price > more interesting in contract with aggregator or wholesaler
 - Slow production ramp up
 - Low yields
 - Diseases
 - Battery/electronic breakdown > warranty & after-sale services
- Adequate training & support

Commercial viability

- Economic viability is not the only decisive factor and is not enough to understand farmers' ability and willingness to purchase the solar technology
- It is important to understand the commercial models for the distribution of the technology
- To facilitate the adoption of solar technologies, innovative models will be needed to increase the visibility of the technologies and decrease barriers to their uptake

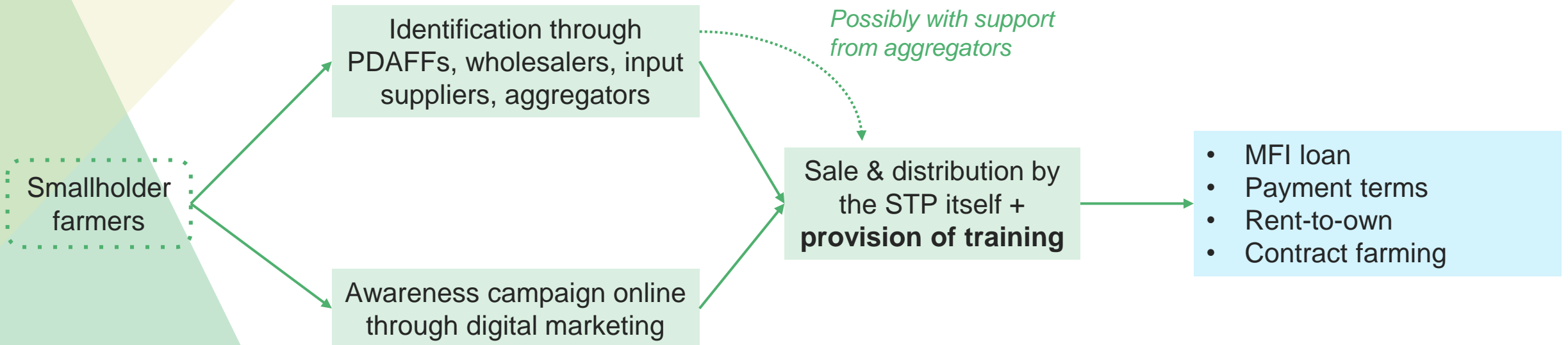
Commercial viability

IDENTIFICATION
OF END-USERS

SALE

END-USER FINANCING

Interesting for STPs to **work with intermediaries** to reach end-users and **facilitate the acceptance of the technology**



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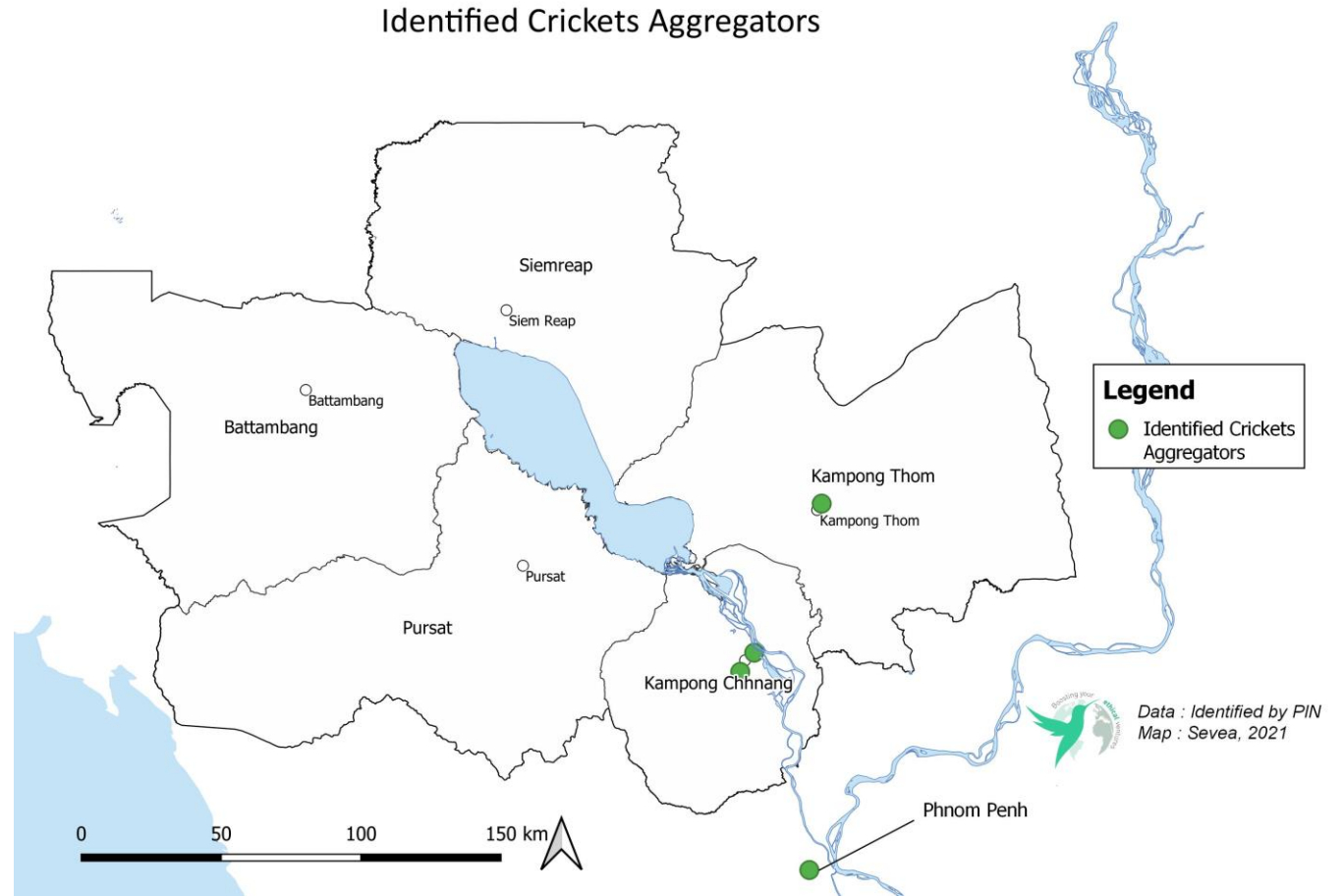
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Estimation of the size of the market

Being a relatively new market, there is rather **low data on cricket production** in Cambodia, making it very hard to estimate the size of the market for solar cricket incubators.

Still, it is interesting to first take a look at the location of **cricket aggregators** as they can act as intermediaries to support the diffusion of the technology.



Economic
Potential

Final Potential of Solar Cricket Incubators

Good potential for both, but need to establish both:

- The final market
- The technological offer



Cricket catchers



Cricket farmers

Adoption Potential

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Recommendations to increase the adoption of solar cricket incubators:

- Partner with stakeholders such as aggregators or specialised agri-businesses to create the access to premium markets and thus avoid overcrowding the local cricket market resulting in price decrease
- Improve the local technological offer of the technology
- Provide training to end-users to ensure the optimal use of the technology
- Improve the visibility of and awareness on the technology, through digital marketing for example
- Introduce end-user financing mechanisms to mitigate the significant upfront costs

Thank You

Feel free to contact any member of the Sevea team if you have questions:


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Annex: Detail of the economic analysis

*The prices displayed on slide 11 indicate the range of price of solutions currently available in Cambodia for a full system (in the case of grid-powered incubator, it is the price of the incubator itself, in the case of solar, it is the price of the incubator & solar system)

**The ROI has been calculated for the following scenarios:

- 1) Newcomer: a smallholder farmer willing to increase their income by starting cricket production by purchasing a solar cricket incubator at 1000\$. They produce 100kg/cycle, with 9 cycles per year. The price of cricket being very volatile, it is important to look at the payback period accordingly: for a cricket retail price of \$1.5/kg (lower bound), the payback is 1.89 year. For a retail price of \$5/kg (upper bound), the payback is as low as 3 months.
- 2) Solar add-on: a smallholder farmer willing to increase the yield of their cricket incubator purchases a solar system to automatically monitor the temperature inside their pens. This add-on is a \$400 investment and is supposed to help reduce workload and decrease the mortality rate of the crickets. Before the installation of the solar system, the incubator produces 50kg of crickets per cycle. The farmer expects the temperature monitoring function to increase their production to 62.5 kg per cycle (+25%). Following these assumptions, the payback of the investment is 2.8 years.