



Utilizing Bokashi for In-situ Decomposition of Highland Corn Residues

Corn for animal feed on steep slopes in northern Thailand is a low-margin, high-damage system that contributes to both soil degradation and air pollution through residue burning. Farmers are caught in a viscous cycle of borrowing money from Banks to purchase seed and fertilizers while experiencing diminishing returns and increasing costs of production. We promote Bokashi to accelerate decomposition of corn stover directly in the field, especially on steep upland slopes in Northern Thailand where transportation is difficult. Utilizing this method activates beneficial microbes, retains nutrients on site, enhances soil structure, and prevents burning.

Description:

In order to create an attractive and easily adaptable solution as an alternative to the burning of crop residues in highland regions, one must focus on the immediate needs of the farmers. These immediate factors are time, labor, money and soil fertility.

Long-term strategy is a multi-pronged approach, however for immediate action, we have condensed down the strategy into various phases, initially focusing on Bokashi microbes to help aid in the decomposition of crop residues in-situ. By training farmers on how to produce Bokashi on their own to work towards self-sufficiency, and by creating a Mobile Lab and Bokashi factory to facilitate more widespread dispersal of Bokashi into fields, we hope to gain the trust of farmers and work towards a more productive and sustainable system.

What is Bokashi:

Bokashi is a composting method that through anaerobic fermentation concentrates beneficial microorganisms to break down organic waste into nutrient dense material. Bokashi accelerates the decomposition process, breaking down food scraps and crop residues in just 2-4 weeks, much quicker than traditional composting,

The process involves mixing organic waste with a carbon rich source, known as Bokashi bran, which has been inoculated with beneficial microbes like yeasts, phototrophic bacteria and lactobacillus bacteria (Aka Effective Microbes, EM) The mixed organic waste and bran are then left to ferment in an oxygen-poor environment, creating a pre-compost which can be added soil to rapidly speed up decomposition. The breakdown of organic matter through using Bokashi creates fertile soil enriched with nutrients and a diversity of beneficial microbial life. Bokashi is especially useful as it helps retain more nutrients than traditional composting systems.

Generally Bokashi is created in airtight containers using rice bran as a carbohydrate source. The methods we are exploring utilize agricultural waste streams as alternative brans and fermentation occurs in-situ (on-site) in agricultural fields rather than in containers. We have identified that the corn cob which is often discarded post-milling, contains up to 74.5% carbohydrates (carbon), presenting a sustainable alternative to rice bran for use in Bokashi. It should be noted though that the corn cob must be crushed or ground to increase the surface area to be most effective in a Bokashi quick fermentations.

To make this method attractive, several strategies are being explored:

- 1. A. Pay for residue, offering cash per kilo or bag collected, funded by the Clean Air Initiative
B. CSR funds for big buyers like CP group
C. Carbon credit scheme**
- 2. Crop residue for input swap that exchanges bailed residue for organic fertilizer, cover crop seeds, Bokashi and EM**
- 3. No-Burn certification for farms that helps provide access to eco-buyers**

Ingredients (Per Batch – 100 kg total)

Ingredient	Amount	Purpose	Local source
Corn Waste (chopped)	70 kg	Carbon source	On-site
Bokashi Bran	10 kg	Nitrogen/microbe support	Agricultural/Industrial waste streams
Molasses	5 liter	Food for microbes	Farm supply store
Effective microbes (EM)	1 liter	Innoculant	Buy or make
Biochar (optional)	5-10 kg	Aeration/microbe habitat	Local biochar kiln
Water	15-20 liter	Moisture activation	Any clean source

DIY EM Solution Recipe (Local Method):

1 Liter Molasses
1 Liter fermented fruit juice (banana, pineapple, papaya) or rice wash water
5 Liter water
Let ferment for 5–7 days in a sealed container (loosely capped)

How to Mix and Apply**Step 1: Chop the Corn Residue**

Cut stalks to 5–10 cm pieces for faster breakdown

Use machete, manual chopper, or shredder

Step 2: Activate Bokashi Mix

1. Mix EM + molasses + water to create an inoculant solution
2. Mix rice bran and biochar (optional) in a pile
3. Slowly spray the solution while mixing until moist like a wrung-out sponge

> > Too wet = bad smell; too dry = microbes don't activate <<

Step 3: Mix with Corn Residue

Mix wet Bokashi blend evenly into chopped corn waste

Use rake, shovel, or hands

For steep slopes: layer directly on the terrace or bed

Step 4: Cover or Mulch

If possible, cover the mixture with banana leaves, tarp, or a light soil layer (keeps moisture/heat in)

Timeline

Warm weather (25–35°C): 2–4 weeks

Cooler highland weather: 4–6 weeks

After this, residue is soft enough to plant into or turn into compost

BOKASHI FOR CORN BIOMASS

Accelerates decomposition of corn stalks, leaves, and cobs directly in the field

INGREDIENTS (PER BATCH – 100 KG TOTAL)

Corn stalks/leaves (chopped)	-70 kg	
Rice bran	10 kg	
Molasses (or brown sugar)	5 L	
EM (Effective Microorganisms)	1 L	
Charred rice husk or biochar (optional)	5-10 kg	
Water	- 15-20 L	

Warm weather: 2–4 weeks

HOW TO MIX AND APPLY

1 Chop the Corn Residue



Mix with corn residue

3 Cover or Mulch



(Warm weather)

2 Activate Bokashi Mix



Spray on rice bran

TIPS FOR SUCCESS

- Apply in strips
- Add biochar to reduce odors
- Interplant legumes (e.g. lablab) after spreading

Business Model: Bokashi Fertilizer Production & Sales (Start with under ฿20,000 investment)

1. Core Products

Product Description	Price
(Retail) Bokashi Starter Mix Pre-mixed EM + rice bran + biochar	฿50–฿80/kg
Ready-to-Use Bokashi Fully-fermented product ready for field application	฿15–฿25/kg
Bokashi Compost Kits Buckets or bags with inoculant, EM, instructions	฿100–฿300/unit
Training Service + Manual 1-day workshop + printed field guides	฿500–฿1,000/farmer
Custom Bokashi Crop Formulas for rice, fruit, veg, cannabis etc.	Custom Rate

2. Target Customers

Primary

Smallholder farmers (organic, regenerative, or looking to reduce chemical use)
Upland corn growers in transition
Mushroom, vegetable, or cannabis cultivators

Secondary:

Ag schools and training centers
Local NGOs promoting sustainable farming
Co-ops and community forests



3. Revenue Streams

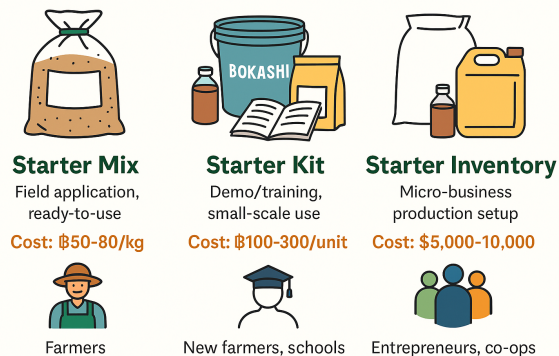
Product Sales: Bokashi starter, fermented Bokashi, EM, Bokashi Kits Monthly subscription or one-time sale
Farmer Workshops: Income + outreach
Custom Soil Solutions: For high-value crops (ginger, cannabis, fruit)
Waste Upcycling Service: Turn local Ag/food waste into Bokashi for others
CSR & Carbon Credits: Partner with companies wanting sustainability credits

4. Production Setup

Process in covered sheds, containers, or low-tech pits

Starter Equipment Needs:

Item and Est. Cost	(THB)
Mixing bins/drums	฿2,000–5,000
Tarps/buckets	฿1,000
Molasses & EM stock	฿3,000
Starter inventory	฿5,000–10,000
Signage + flyers	฿1,500



5. Marketing Strategy (Thailand)

- Partner with organic markets, eco-resorts, and co-ops
- Use Facebook, TikTok, LINE groups for farmer demos
- Film local success stories and field demos
- Sell at ag expos, temples, Sunday markets, and ag fairs
- Word of mouth + trusted farmers as Bokashi ambassadors

6. Social & Environmental Impact

Replace burning with composting
Reduce chemical fertilizer dependency
Improve yields and water retention
Create rural jobs (mixing, collecting, training)

7. Projected Profit Margin

Item Cost	(THB/kg)	Sell Price (THB/kg)	Margin
Bokashi starter mix.	20–30	50–80	60–150%
Ready-use Bokashi	5–10	15–25	100%+
Workshop fee	100–200/person.	500–1,000	300%+

**With 30–50 recurring clients, this can bring in ฿20,000–40,000/month, scalable with partnerships **

3-Month Startup Action Plan (Q3 2025) Roadmap from idea to income

- Month 1: Foundation & Prep
- Secure \$5-10K initial funding
- Build first Bokashi production facility
- Develop Thai-language training manuals and video scripts
- Design simple “No-Burn” Certification flow
- Identify 3 pilot villages or farms
- Register social media + LINE community

Month 2: Demo & Outreach

- Launch “Mobile Bokashi Clinic” – 2 demo days/week
- Film on-site videos in Thai (with subtitles)
- Collect soil/yield baseline data from demo sites
- Offer early-bird Bokashi + training packages
- Begin franchise/partner recruitment

Month 3: Feedback & Scale

- Collect testimonials and feedback from early users
- Host village field day with 3 pilot farms
- Certify 5+ “No-Burn” Bokashi ambassadors
- Evaluate cost-per-farmer and refine pricing model
- Apply for small grants or carbon-credit pilot projects
- Launch basic Bokashi starter kits for resale



Jai Dee Bokashi – Helping to make Regenerative Farming Profitable in Thailand

Problem:

Every year, over 1 million rai of Northern Thailand farmland is burned to clear crop residue, especially in corn-growing areas. This causes massive air pollution, depletes soil fertility, and traps farmers in a cycle of chemical input dependency.

Solution:

Jai Dee Bokashi delivers low-cost, locally made microbial fertilizer solutions to help farmers stop burning, rebuild soil, and increase profits — all with a fast, odor-free fermentation process.

Product/Service:

Bokashi Fertilizer: Premium anaerobic compost starter

Mobile Bokashi Clinics: On-farm demos and training

No-Burn Certification Program: Earn carbon & ESG credibility

Franchise Model: Train and empower village groups



Market:

5M+ rai of corn land at risk of burning

1M+ smallholders seeking cheaper, natural alternatives

Government interest in fire-reduction, soil restoration & sustainable ag

Competitive Advantage:

Made from local waste materials

Fast fermentation (7-14 days)

Portable & scalable

Thai-language education materials



Business Model:

B2B Sales to farms, ag co-ops, and NGOs

Franchise/Training Kits for village enterprises

Partnerships with reforestation and carbon offset programs

Traction & Goals:

Pilot farms in Chiang Mai & Nan

Early adopter testimonials

3-month demo tour launching Q3 2025

Funding Need:

💰 \$10K – seed round to scale production, create training content, and fund pilot outreach.

A No-Burn Certification Program in Thailand can help farmers gain carbon and ESG credibility, but requires balancing simplicity, integrity, and local relevance. This approach is scalable and trainable which will allow farmers direct technical support to help with implementation and troubleshooting.

“No-Burn Farming Certification Program – Thailand

Program Structure: 4 Key Pillars

1. Eligibility & Enrollment

Who Can Join:

Thai smallholder farmers, village groups, or co-ops.

Minimum Requirements:

Land plot registration or clear land use rights

Commitment to zero open burning for a full season

Participation in basic training (1 day)

Enrollment Process:

Farmer signs a commitment letter

Geo-location of fields using mobile form or app

(can use ODK, Survey123, or KoboToolbox)



2. Practices & Verification

Approved Practices:

In-field composting using Bokashi

Mulching, no-till or minimal tillage

On-site biomass management z

Verification Options:

Photo Logs: Farmers or field officers submit before/after photos

Random Field Checks: Community field agents or drones verify

Satellite Monitoring: Use open data (e.g., VIIRS or FIRMS) to check fire alerts

Simple soil carbon testing (optional in pilot)



3. Certification Tiers

Farmers earn different levels depending on practices, consistency, and improvements.

Tier	Practices Verified	Recognition and Benefit
Bronze	No burning, Bokashi use	Local certificate + sticker
Silver	Field composting + soil improvement	ESG brand partner logo usage
Gold	Biodiversity + carbon tracking	Eligible for carbon revenue

4. Incentives & Impact Pathways

Short-Term Rewards:

Free Bokashi starter kits

Public recognition, farm signage

Access to training and support network

Medium-Term:

Verified "No-Burn" label for supply chain inclusion

Connections to ESG-driven buyers or exporters

Potential inclusion in reforestation or agroforestry projects

Long-Term:

Carbon credit program participation via grouped farms (PoA – Program of Activities)

Partnerships with carbon project developers (e.g., Verra, Gold Standard)



Deliverables & Tools Needed

 Farmer registration forms (print and digital)

 Geo-tagging app for field mapping

 No-Burn Field Guide + Flipcharts (Thai language)

 Photo documentation system (can use LINE groups or WhatsApp)

 Printable certificates + field signs

 ESG and carbon partners (NGOs, buyers, CSR orgs)



Certification Program Cycle Example

Month	Activities
1	Recruitment, training, onboarding
2-4	Implementation & monitoring
5	Certification review
6	Recognition event + ESG linking

*Annual Optional renewal + carbon credit tracking

How to Launch It (Pilot Plan)

Pilot Area: Chiang Mai / Nan / Mae Chaem

Scale: 10–50 farms in first season

Lead Partner: Jai Di Agriculture

Support Needed:

Local Ag offices or NGOs

Satellite fire monitoring (can partner with AirVisual or Geo-Informatics)

Possible funders: GIZ, RECOFTC, EarthNet Foundation, CSR division

Commercial Bokashi Production: Jai Dee Compost and Bokashi Factory

In our efforts to create training videos and initial Bokashi stock for distribution, we will create a factory and education center in Nam Phrae, Hang Dong. There we will trial several methods of commercial production including: Bokashi pits, a three-bay composting system, and Bokashi fermentation done in large containers.



Bokashi Pit or Trenches: Dig shallow trenches (~30-50cm deep), Layering corn waste with Bokashi bran, cover with soil and wait 2-3 weeks. After the initial breakdown of 2-3 weeks, a stabilized pre-compost starter will occur allowing for direct planting into the trenches.

Three Bay System: Continuous process allows for perpetual harvest of Bokashi

Bay	Function	Time Frame	Notes
Bay 1	Mix Bokashi with bulk materials	Week 1-2	Mixing + partial breakdown
Bay 2	Active hot composting	Week 3-4	Maintain heat, aeration
Bay 3	Curing & maturation	Week 5-6+	Final breakdown, stable product

Large container Fermentation: Sealed containers layered with organic material and Bokashi bran ferments for 10–14 days. The process also produces Bokashi tea, a nutrient-rich liquid that drains from the waste and can be sold and used as a natural fertilizer and Foliar spray.

** Additionally, we will use the Bokashi produced through these methods to trial various forms of commercial composting methods on-site, producing high-quality compost for sale and for exchange in our crop residue for inputs trade scheme

A Mobile Bokashi Clinic will be piloted with:

- Live mixing demos
- Starter kits (EM, rice bran, manuals)
- Thai-language training videos (3–4 mins)
- Printed resources and technical support

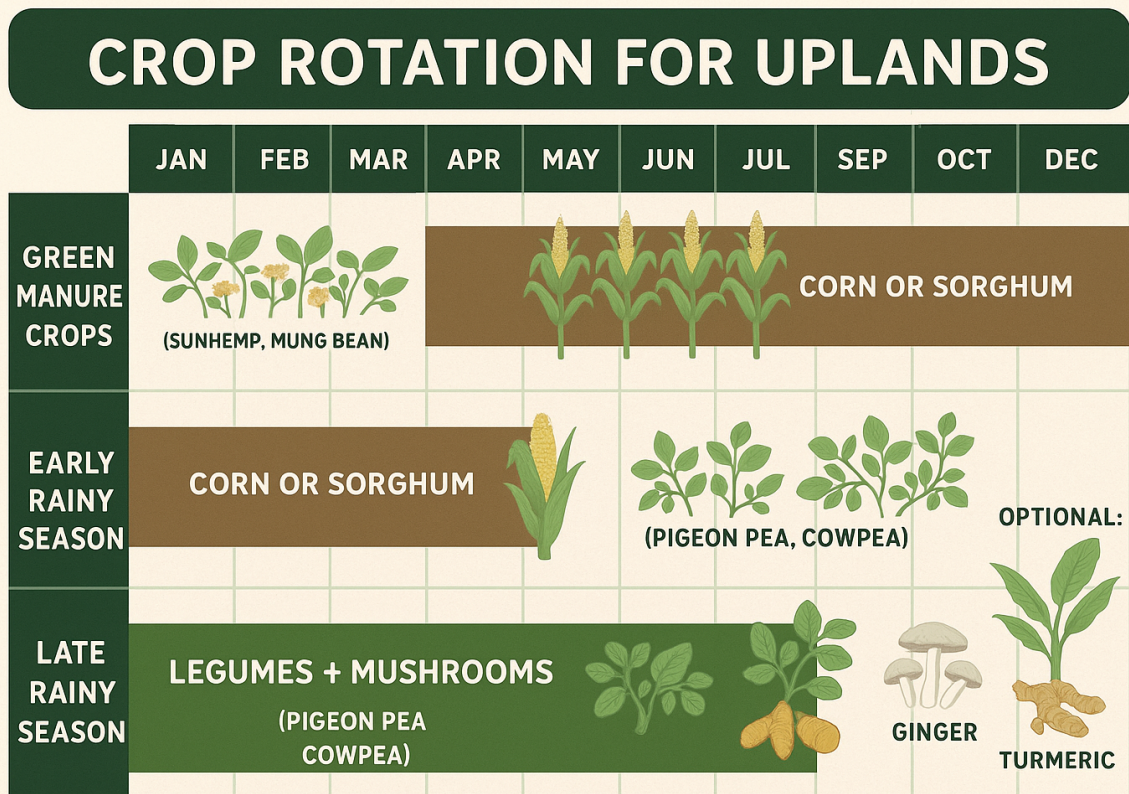


The Mobile clinic will not only help with the dispersal of resources, but will also bring more awareness to our efforts and offer farms registration in our No-Burn Bokashi network. Once the farmers meet the qualifications, they can begin working towards their No-Burn Certification. Collaboration is possible with ERDI and Warm Heart Foundation to enhance our demonstrations by offering further training and resources focused on Biochar production and utilization.



Tips for Success on Steep Slopes

- Apply in strips or contour rows to stabilize erosion and manage water
- Interplant legumes (lablab, sunhemp) right after spreading Bokashi-treated waste
- Add a little lime or wood ash if strong odor or acidification occurs
- Combine with biochar to lock in nutrients and reduce methane
- Offer economical alternatives to corn cultivation to steer away from mono-cropping
- Implement a rotational farming model and consider intercropping



Mission: Help Thai farmers reduce burning, build soil health, and cut chemical input costs using high-quality, locally made Bokashi

Long Term Goals: Working Towards Gold Tier Certification

Corn for animal feed on steep slopes in northern Thailand is a low-margin, high-damage system that contributes to both soil degradation and air pollution through residue burning. To transition farmers toward profitable, regenerative alternatives, we will promote: **rotational planting**, **intercropping** and introducing **perennial crops** to encourage biodiversity and diversify revenue streams for the farmers. This will allow the farmers to work towards Gold Tier No-Burn Certification while supplementing their income and promoting soil and habitat restoration.

By implementing a three-season **Rotational Cultivation** cycle, we are able to add fertility back to the soil while also being able to supplement the incomes of farmers further. Rotational farming allows the harvest of additional crops throughout the year instead of monocropping highland corn and relying on a single harvest to provide income from the cultivation area. In the Dry Season, nitrogen-fixing legumes like sunhemp, sesbiana or mung bean can be grown as Green Manures. By using the chop-and-drop method, nitrogen is returned to the soil, thus allowing the farmers to diminish their need for additional nitrogen fertilizers for their main corn crop. This returning of fertility to the soil lowers input costs and increases production long term. In Late Rainy Season, after harvesting the main crop of corn has taken place, nitrogen-fixing legumes like pigeon and cow pea can be grown for sale, and additionally ginger and turmeric can be grown under their shade through intercropping methods thus further increasing the income of farmers in the “off-season”.

Intercropping is a sustainable practice that involves growing several crops simultaneously in the same field. This technique, also known as polyculture, can increase land use efficiency, potentially reduce input costs, and enhance soil health. A well known example of this is Three Sisters method which is a traditional companion planting technique used by Indigenous peoples of North America, involving the symbiotic cultivation of corn, legumes, and squash together. This method creates a mutually beneficial environment where each plant supports the growth of the others. The corn provides a stalk for the beans to climb, the beans fix nitrogen in the soil, enriching it for the corn and squash, and the squash provides ground cover, suppressing weeds and retaining moisture. Through Agroforestry systems, ultimately our goal is to work towards reforestation and habitat restoration by incorporating perennial crops and redeveloping a diverse and thriving ecosystem.

Perennial crops are plants that live for more than two years and don't need to be replanted annually. Perennials can produce for multiple growing seasons, sometimes even for decades. This category includes many fruit and nut trees, some herbs, and even certain vegetables. Lemongrass, citronella, and vetiver are examples of economic herbs which can be harvested recurrently and help to provide erosion control on the fields. The best perennial crops will:

- Be suited to upland terrain and climate
- Have higher market value or local demand
- Improve soil health and biodiversity
- Reduce or eliminate the need to burn residues

Long term, our hope is to help farmers adapt all these methods to work towards achieving Regenerative Practices. By combining the above mentioned methods, we can positively change the fate of both the farmers and the environment. For further information and future collaboration, please reach out to Jaidee Agriculture.

Same dream, same team.

Contact:

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Upland Crop Rotation Calendar

(Northern Thailand)

Assist upland farmers transition from corn monoculture to diversified, profitable, and soil-regenerating rotations based on seasonal patterns

Month	Season	Cropping Options
JANUARY	DRY SEASON	Turmeric (harvest), Lemongrass (ongoing), Soil Cover 
FEBRUARY	DRY SEASON	Prepare for Pigeon Peas, Composting, Bokashi 
MARCH	DRY/HOT SEASON	Sowing Pigeon Peas, Cowpea, mulching 
APRIL	START RAINY SEASON	Grow corn with legumes, weed control 
MAY	RAINY SEASON	Apply Mulch, Monitor Soil Health 
JUNE	RAINY SEASON	Turmeric Growth, Banana Transplant 
AUGUST	RAINY SEASON	Apply Manure/Soil Cover to Reduce soil burning 
SEPTEMBER	RAINY - DRY SEASON	Harvest Turmeric, Clean Up Residuals 
OCTOBER	DRY SEASON	Dry Season is Jaidee, Bokashi Prep, training, or tools 

Recommended Crop Categories



LEGUMES

Pigeon Pea, Mung bean



PERENNIALS

Lemongrass, Bananas



ROOTS & HERBS

Turmeric, ginger, cassava



INTERCROPS

Combine corn with legumes to reduce chemicals burning the soil



GREEN MANURE

Soil Cover

Notes for Farmers

- Start bokashi or composting 2-3 months before planting
- Always cover soil after harvest with mulch or green manure
- Rotate corn with legumes or turmeric to amend soil
- Use rainy season to establish perennials for erosion control rows

CORN VS. ALTERNATIVES

ROI	ROI
 Low Avg, profit of 1,000–2,000 THB/rai	 Higher Avg, profit potential 3,000–10,000+ THB/rai
Environmental Impact	Environmental
 Crop burning causes air pollution Erodes soils on steep slopes	 Don't require burning Better for soil and water

To achieve this larger image and implement lasting changes, it requires a concerted effort from many who share the same vision and desire for change. Sustainability needs to be a focus and people must be accountable as we work to preserve the land for future generations.

CORN vs. ALTERNATIVES

CORN



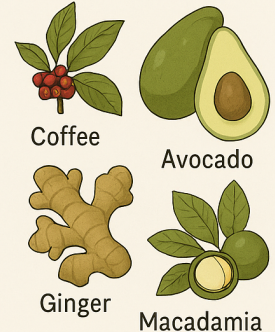
Return on Investment

Low profits:
฿ 1,000–3,000 per rai
High input costs for fertilizers, chemicals

Environmental Impact

Depleted soil fertility
Erosion on steep slopes
Crop residues are burned

ALTERNATIVES



Return on Investment

Higher profits:
฿ 8,000+ per rai

Diversified income sources

Lower input costs

Environmental Impact

Improve soil health
Reduce erosion
Residues are fully used



GETHAC

German-Thai Agricultural Cooperation

A special thank you to everyone involved. I would like to personally thank Mr. Karsten Ziebell and GETHAC for the opportunity to bring forward initiatives and change in Thailand. This project is both empowering and inspiring