PRISMA

Climate spotlight

Climate Smart Agriculture Case Study

Emission Control Blocks for Cattle

Enhancing Productivity and Reducing Emissions in Indonesia's Cattle Industry

PRISMA is a partnership between the Indonesian Government (Bappenas) and the Australian Government (Department of Foreign Affairs and Trade) to boost the incomes of smallholder farmers by increasing farm productivity. PRISMA works with private sector partners to develop commercially viable business models to increase the distribution of technologies, services, and products that improve productivity. The majority of PRISMA's partnerships have climate-smart agriculture elements. Climate-smart agriculture aims to increase agricultural productivity while ensuring farmers' resilience to climate change and reducing the agriculture sector's environmental footprint. This case study draws from PRISMA's experience to demonstrate how the private sector supports farmers adapting to climate change and reducing emissions.

Kementerian PPN/ Bappenas

Australian Government

Introduction

Livestock production contributes to climate change, with cattle producing 14.5 percent of global greenhouse gas emissions. Each year, a single cow emits about 220 pounds of methane.[1] Cattle methane is shorter-lived than carbon dioxide but 28 times more potent in warming the atmosphere.[2]

Concerns about methane gas production are mounting as global meat and milk production rises. Worldwide beef and milk production has been projected to increase by 19 percent and 33 percent by 2030, respectively, contributing to feeding an estimated 8 billion people. Over 80 billion animals are slaughtered annually, producing 48,340 million tonnes of meat for human consumption.[3]

The risk of methane emissions increases is higher in middle-income countries like Indonesia. Indonesia is still dominated by smallholder farmers who use inefficient farming practices. This leads to lower growth rates and potentially higher greenhouse gas emissions per unit of meat or milk produced. Indonesia is one of the largest beef producers in Southeast Asia. Projected growth in annual beef meat consumption is expected to reach 10.3 percent by 2025, with a projected increase of 20.4 percent by 2045.[4] Beef is crucial for diet and religious ceremonies, as more than 85 per cent of the Indonesian population is Muslim.

As demand and supply grow, the industry is considering ways to minimise its harmful environmental effects. An environmental life cycle impact assessment study conducted by PRISMA in 2018 revealed that using a more nutrient-dense feed (concentrated) can lower the greenhouse gas emissions produced by animals. PRISMA has worked on partnerships to expand the use of concentrated feed since 2015; nonetheless, it has noticed further opportunities to decrease greenhouse gas emissions through feeding and animal nutrition innovations.

> *To continue achieving these increasing demands requires substantial improvements in adopting existing and emerging 'best practice' husbandry, health, welfare, and climate-smart innovations for livestock production*
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> **Windsor, P.A., Hill,** J. 2022

[1] Quinton, A. (2019). *Cows and Climate Change: Making Cattle more Sustainable*. UCDavis. https://www.ucdavis.edu/food/news/making-cattle-more-sustainable

[2] Mitloehner, F. (2023). *Rethinking Methane with UC Davis Professor and CLEAR Center Director*. Clarity and Leadership for Environmental Awareness Research at UC Davis. https://clear.ucdavis.edu/news/dr-frank-mitloehner-guests-dairy-intelligent-podcast-rethinking-methane

[3] Windsor, P.A., Hill, J. (2022). Provision of High-Quality Molasses Blocks to Improve Productivity and Address Greenhouse Gas Emissions from Smallholder Cattle and Buffalo: Studies from Lao PDR. *Animals (Basel)*, 12(23): 3319. https://doi.org/10.3390/ani12233319

[4] Arifin, B., Achsani, N.A., Martianto, D., Sari, L.K., & Firdaus, A.H. (2019). The Future of Indonesian Food Consumption. *Jurnal Ekonomi Indonesia*, 8(1). https://jurnal.isei.or.id/index.php/isei/article/view/13/4#:~:text=The%20beef%20consumption%20projection%20increases,2045%20(food%20demand%201)

Licking methane emissions
The product and business model

AgCoTech Australia Pty Ltd is a technology company that produces an emission control block (ECB), a medicated block that improves productivity while reducing emissions. The block contains high-quality nutrients and various active methane mitigants tailored to different environments, seasons, and cattle types. It enhances the animal's digestion of poor-quality feeds, botosting its immune system and improving health and welfare outcomes.

AgCoTech is new to Indonesia and operates in Laos, working through local partners to produce and distribute the blocks. To establish science-based targets, AgCoTech follows verified carbon standards, namely Verra[5] and Gold Standard,[6] to measure the reduction of methane gases produced by animals

consuming AgCoTech's blocks. The methane reduction is then quantified and recorded as carbon credits.

This carbon credit benefits AgCoTech and other entities aiming to achieve carbon neutrality for their business operations through carbon offset mechanisms. This occurs through a carbon trade, where different entities (acting as buyers) purchase carbon credits from AgCoTech via a trading platform. The revenue from this transaction is used to fund AgCoTech's operations in establishing a production facility in the country and educating and distributing the blocks to farmers. This will allow more smallholder farmers to use the blocks to improve productivity while reducing greenhouse gas emissions on their farms at no cost. In this business model, there are a number of benefits to smallholder farmers who would otherwise have no tangible access to carbon offset markets.

[5] The Verra Registry https://registry.verra.org/

[6] The Gold Standard https://registry.goldstandard.org/projects?q=&page=1

Building the business blocks

Since early 2023, PRISMA has partnered with AgCoTech to facilitate its entry into the Indonesian market. AgCoTech conducted a tailored, in-country pilot study to establish science-based targets for operations in Indonesia. Having conducted similar research in Laos, AgCoTech needed an approach that suited the local cattle context. This included conducting local research on the blocks based on verified standards and developing agreements for production with local partners to register and distribute the products.

Recognising the blocks' potential to increase smallholder farmer productivity and reduce greenhouse gas emissions, PRISMA supported AgCoTech's first trial in Indonesia. The trial established the methodology and science-based target measurement in Indonesia and developed a business case that suits Indonesia's farming context. The partnership also supported research into a better understanding of carbon verification processes and regulations in Indonesia.

The research in Central Java and East Java, the two provinces with the most significant meat and dairy milk production in Indonesia, confirmed the emission control blocks' impact on productivity and methane emission reductions.

PRISMA also facilitated AgCoTech's connection and working with prominent experts from two universities in the country: Gadjah Mada University (UGM) and Brawijaya University (UB). These engagements have helped to enhance AgCoTech's study and learning process of the Indonesian cattle industry.

The result

The collaboration between PRISMA and AgCoTech has enabled the company to make significant progress with its business plan in Indonesia. Previous product trials have shown that AgCoTech's blocks can increase beef and dairy cattle yield, with a reported methane abatement of at least 18 percent. These findings have prompted AgCoTech to further develop, reformulate, and test the blocks to create the final Indonesian emission control blocks with even higher methane abatement potential.

From the farmers' perspective, the provision of emission control blocks has led to additional benefits such as reported improved reproduction, increased yield, delayed dry periods in dairy cattle, faster recovery from diseases, and enhanced physical growth of livestock. Farmers have also noticed a decrease in environmental odours from their treatment pens, and also reporting less manure produced following block consumption.

These positive results have allowed AgCoTech to advance partnerships with local companies such as Rajawali Nusantara Indonesia and Nutricell Pacific. AgCoTech has also gained confidence in the Indonesian market by investing in further research and business exploration to strengthen the block's formulation and identify raw material sources better suited to the local environment.

> *This is so good. This will encourage youth back into agriculture.*
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> **Sriyono**, Smallholder Dairy Farmer, Central Java

> *I think it would be wonderful for beef farmers if we could use these blocks during the early stage of fattening when cows are still skinny and at their rapid growing curve.*
>
> **Harun**, Smallholder Dairy Farmer, Central Java

Is the product going to be available in Indonesia? Reproduction has been an issue since we were hit by FMD & LSD, but I have seen approximately an 80% increment in cattle experiencing heat (from initially 2 to 15 calves) after the blocks. Amazingly, I have also seen an increase in milk production of 4-8 litres in several blocks-consuming cattle. There was also a time between trials when I was worried about 2 of my non-trial cows falling sick. I asked whether I could give the spare blocks to those cows, and AgCoTech let me do so. I was surprised that they were recovering speedily without providing injected medicines.

Joko, Smallholder Dairy Farmer, Central Java

What next?

AgCoTech is progressing from its first trial in Central Java. Using the lessons learned from the pilot study, it aims to gather more data from another trial in East Java, this time with a certified resource's deployment of a methane laser to strengthen impact data. The trial in East Java is crucial for AgCoTech to enhance its methodology for verifying carbon credits. These studies will enhance AgCoTech's research findings and credibility, as both provinces represent many cattle populations in Indonesia. The analysis results are hoped to enable AgCoTech to establish the science-based targets to publish the study in an Indonesian journal and undergo further verification through an internationally recognised standard such as Gold Standard or Verra.

AgCoTech has progressed with signing business deals with long-engaged local partners and will gradually oversee the business operation with these partners, including raw material sourcing, setting up production machinery, establishing distribution channels for smallholder farmers, and product registration.

Partly supported by PRISMA, AgCoTech has obtained information regarding agricultural product and climate action registration in Indonesia, including those issued by the Ministry of Environment & Forestry (KLHK) or, if necessary, the Ministry of Agriculture (MoA). While there are more steps ahead, there's a strong evidence base and partnerships to build from.

About PRISMA

PRISMA is a partnership between the Government of Indonesia and the Government of Australia to increase the productivity and income of smallholder farmers. Increased productivity contributes to food security and builds farmer resilience to market and agricultural shocks, including climate change.

PRISMA is supported by the Governments of Australia and Indonesia and implemented by Palladium, with Technical Assistance from Swisscontact, Zurich.

Find out more:
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