インタビュー結果　サマリー

Vietnam | Vietnam Dairy Products Joint Stock Company (Vinamilk)

組織の概要
- Vinamilkはベトナム最大の乳製品製造会社
- 2023年時点でベトナムに14の酪農場と14万頭の乳牛を有する

持続可能な農業に関する対象組織の取り組み
- Vinamilkの主な事業は牛の飼育と酪農生産で、50カ国以上に輸出
- 特に輸出市場からは、低炭素生産を求める圧力が高まっている
- 従って、2027年までにGHG排出量を15％削減し、2035年までにGHG排出量を55％削減し、2050年までにネットゼロを達成する目標を立てた
- 同社は、ソリューションとして、再生可能エネルギーの活用と、生産全体を通じてGHG排出量を最小限に抑えることに主眼を置いている
- Vinamilkは、カーボンニュートラルの認証を受けた工場と農場を2つ設立
- また、100%の農場が、バイオガス技術を使用し、牛の排泄物を資源に変えている
- また、現在下記のような技術・ソリューションを導入
    - ウシからのメタン排出を削減するための飼料の利用
    - 栄養プロファイルの調整
    - 農場のエネルギー効率の向上
- 現在の技術の適用や改良は、GHG排出削減において期待通りの効果が得られない可能性があるため、Vinamilkはより継続的により良いソリューションを探索している

現地ニーズの高い技術/ソリューション
- Vinamilkとしては、下記の技術・ソリューションを探索：
    - メタン排出を削減する飼料添加物
    - 再生可能エネルギー
    - エネルギー効率の高いシステム
    - 循環型経済に資するソリューション・技術
- 同時に、コスト競争力を維持することも望んでいる

日本政府・企業への期待
- 新しい技術・サービス・製品のインパクトが目に見えて明確であれば、日本企業との連携はウェルカムである
- 2021年末、Vinamilkとそのメンバー企業である Vilico は、ベトナムで肉牛を開発するための契約を双日と締結した
- このパートナーシップのために、ビナミルクは牛肉生産によるGHG排出量を削減するソリューションを探している
- プロジェクトは2025年開始予定で、ビナミルクが日本の業者と協力する初めてのケースとなる
- ビナミルクとビリコ、双日とベトナムにおける肉牛開発に関する契約を締結 (nongnghiep.vn)

Vietnam Dairy Products Joint Stock Company (Vinamilk) (1/2)

Organization information

- Vinamilk is the biggest dairy company in Vietnam.
- In 2023, Vinamilk has set out pathway to Net Zero by 2050 - to cut GHG emissions by 15% by 2027, 55% by 2035, and reach zero net by 2050. Their primary focus is on utilizing renewable energy and minimizing GHG emissions throughout production.
- Vinamilk has published annual sustainability report since 2012 (Sustainable Development – Vinamilk)
- In 2023, they have 14 dairy farms and 140K milk cow in VN. 100% of Vinamilk farms using Biogas technology, converting cow waste into resources. They have also set up 2 factories & farms certified as Carbon Neutral
- They have applied several technologies and improvements at all farms, such as

- Adjusting cow feed – nutrition profile to reduce methane emission
- Improve energy efficiency level in their farms

1. Social issues of Sustainable agriculture in Vietnam

- Vinamilk's main business is cow farming and dairy production, and they export to 50+ countries. There are increasing pressure, especially from export markets, for low carbon production.
- Vinamilk focus on scope 1 and scope 2 emissions:
    - Scope 1: Their key focus include methane emission reduction (e.g biogas, nutrition), following net zero pathway announced last year for dairy farms
    - Scope 2: They focus on reducing electricity used
- Current progress: on track to achieve emission reduction goals
- However, current technology application and improvement might not be effective in GHG emission reduction as they expect. Therefore, Vinamilk is looking for better solutions.

Interview result for Vietnam | Company - User

Vietnam Dairy Products Joint Stock Company (Vinamilk) (2/2)

2. Demand for sustainable agriculture

- Vinamilk is looking for technology solution to reduce GHG emission, such as:
  - Feed additive to reduce methane emissions
  - Renewable energy
  - Energy efficient systems
  - Circular economy practices
- At the same time they want to remain cost competitive

3. Companies in sustainable agriculture

- Vinamilk worked with different vendors to develop sustainable solutions. For example: they work with feed companies to adjust the feeds, and with farm equipment companies for energy-efficient system
- In late 2021, Vinamilk and its member company, Vilico has signed an agreement with Sojitz to develop beef cattle in Vietnam. For this partnership, Vinamilk is looking for solution to reduce GHG emissions from beef production. The project is planned to start next year (2025) and will be the first time Vinamilk working with Japanese vendors. See more: Vinamilk and Vilico signed an agreement with Sojitz to develop beef cattle in Vietnam (nongnghiep.vn)

4. Future prospect for Japanese cooperation

- There is strong potential for Japanese companies to work with Vinamilk, if the impact of new technology/services & product is visible and clear

5. Possible solutions for cooperation

- Mr. Nam can introduct NRI to Sojitz's team for collaboration opportunities
- Vinamilk will conduct pilot test for suitable technology/services at the first few farms before expanding to all farms

インタビュー結果　サマリー

BSIP (The Agricultural Instruments Standardization Agency)/Indonesian Center for Agricultural Land Resources Instrument Standardization (ICALRIS) of Ministry of Agriculture of Indonesia

組織の概要

- BSIP/ICALRIS が所属する総局は日本ASEANみどり協力プランのメンバーであり、JAIFのプログラムにも参加
- 持続可能な農業の実践には様々な機関が関わっている中で、BSIP/ICALRISは標準化に重点を置き、持続可能な農業が “farm to table ”で実践されることを目的に活動をしている

持続可能な農業に関する対象組織の取り組み

- MoA内の研究開発組織には64の研究所があり、34は農民の指導に重点を置き、30は商品、土地、バイオテクノロジー、ポストハーベスト、農業機械化、コメ、獣医などに関する研究開発を担当している
- 研究開発の方向性は、インドネシアの農業をいかに効率化するかということである
- 持続可能性、環境負荷低減の農業に関しては、農家への実際の裨益が必須であり、そのためには効率性の向上を併存させなくてはいけない

直近の具体的なプロジェクト

- MIRSA (mitigation in Irrigated Rice Systems in Asia) ： このプロジェクトはインドネシアでAWD技術を試験的に導入しており、国内での標準化を志向している
- INASOIL (information system） ： 土壌マップ、気象情報等を提供
- SIAP TANAM ：農家向けの情報提供プラットフォーム
- SISCrop 2.0 ： 立木作物情報システム
- 効率的な肥料使用やと低メタン栽培の推奨ガイドラインの提供
- 稲作農家とのネットワーク整備
- スマート土壌検知キットの提供

持続可能な農業に関する課題

- 主に農作物の生産性の低下により、544兆ルピアの経済的損失が発生する可能性がある
- またGHG排出の観点で、インドネシアでは、稲作からの排出が最も多い
    - 気候変動緩和策として計画されているのは、バイオガスの開発、有機物(有機廃棄物)管理の高度化、「有機農業村」の設置、低炭素排出米品種の促進など
- 政府の大目標は、食料安全保障と主権であり、政府は、生産性と持続可能性を並行して促進したいと考えている。
- どのような解決策も、生産性と持続可能性の両方に取り組むものが優先される。

- **日本への期待**
- 具体的に連携が期待される分野は下記である。下記に資する日本企業を紹介いただきたい。
    - 持続可能な農業慣行に関する標準化
    - GHG排出のサンプリングや排出量計算に関する標準化
    - MRV：GHGの測定、報告及び検証
    - 特定のGHG排出計数に関する改善技術開発
    - デジタルを活用したGHG排出量計算
    - 衛星データを活用したMRV
- BBPSIは農家に直接利益をもたらすコラボレーションを志向している。
    - 例えば、ある韓国企業はスラウェシの農家に彼らのソリューションを導入し、ステビアを栽培する支援をし、収穫後、その商品を購入
    - BBPSIはコラボレーションが一連のワークショップの運営のみという支援はもはや必要としていない。
    - 具体的な利益（例えば投資）につながることを期待している。

Meeting Memo with BBPSI (Agricultural Instrument Standard Application Center) of Ministry of Agriculture of Indonesia (1/2)

BBPSI PIC's opening remarks:

- MoA of Indonesia is currently drafting action plan for sustainable agriculture, this includes strategic priorities, key activities and implementation frameworks. The activity is being done together with other SEA member states. The directorate general (which BBPSI belongs to) is the member of ASEAN-Japan Midori Program, and also involve in JAIF's program.
- Implementation of sustainable agriculture practices involves many different institutions. BBPSI is focusing on standardization, ensuring sustainable agriculture practices are standardized from "farm to table"
- BBPSI expects to have a collaboration that can benefit directly the farmers. For instance, a Korean company had helped farmers in Southeast Sulawesi to deploy their solutions and grow Stevia. Once harvested, it then purchased the commodity. BBPSI expects the collaboration will lead to tangible benefits (e.g. investment), not only running series of workshops.

BBPSI Presentation - Example of Recent Initiatives and Expected Collaboration Areas:

- **Imperative of sustainable agriculture**: Sustainable agriculture is a critical issue. It could potentially create economic loss of IDR 544 trillion primarily due to decrease in crops productivity. In Indonesia, highest emission comes from rice cultivation. Mitigation actions being planned includes development of biogas, organic material management, development of "organic village", promotion of low emission rice varieties, etc. The big goal of the governments include food security and sovereignty. Govt wants to promote productivity and sustainability in parallel. Any solution should address both productivity and sustainability.
- **Example of collaborative project**: MIRSA (mitigation in Irrigated Rice Systems in Asia) Project is one of major projects implemented. This project is piloting AWD technology in Indonesia.
- **Recent initiatives**:
    - INASOIL (information system), accessible through awr.bsip.pertanian.go.id which includes soil map, agroclimate map, thematic map, residual map, stability land map
    - SIAP TANAM (information system for farmers)
    - SISCrop 2.0 (standing crop information system)
    - Issuance of fertilizer recommendation (guideline to farmers) and low methane cultivars
    - Consultation channel with rice farmers
    - Smart soil sensing kit
- **Expected collaboration areas with Japan** : develop standardization for environmentally-friendly agriculture zone/terrain; standardization for sampling, collection, measurement of GHG emission; standardization of MRV; specific emission factor; online emission calculator; MRV based on satellite.

Meeting Memo with BBPSI (Agricultural Instrument Standard Application Center) of Ministry of Agriculture of Indonesia (2/2)

R&D Organization:

- In the R&D organization within MoA, there are 64 institutes, 34 focus on guiding farmers, 30 responsible for R&D related to commodities, land, biotech, post harvest, agri-mechanization, rice, veterinary etc.
- Sustainable agriculture is a big issue. There is a law regulating the matter.
- The direction for the R&D is on how to make agriculture in Indonesia becomes more efficient. It aims to promote a low input agriculture.
- The activities include promoting the adoption of precision farming, implement crop calendar, and so on. In this regard, market intelligence is also needed (e.g. predict the trend of rice price).
- The R&D unit and standardization unit (BBPSI) works hand-in-hand. Standard for organic agriculture must follow national standard of Indonesia called "SNI". This national standard is based on international standards.

Introduction from each department under BBPSI:

- Horticulture Standardization Dept: Focus on standardization of practice from "farm-to-table" specific for Vegetables, Tropical fruits, Ornamental plants, Citrus and Subtropical fruits. This department promote the production of potato seeds based on Indonesian standards. These follow ASEAN standards. It also promote standards on how to develop seeds of other horticulture commodities. There are 6 commodities under this seed making standardization. It expect to promote export of those commodities.
- Estate Crops Dept: the goal is to develop Indonesian national standards for the following commodities coconut seed, arabica coffee seeds (West Java origin), clove seeds, sugarcane seeds.
- Livestock dept: develop standardization of production of DOC (day old chicken), DOD (day old duck), feed crops (indigofera species)
- Food crops: standardization in following commodities: rice, legume, cereals, maze, soybeans, casava, sweet potatoes and so on.

Others

- JAIF's project have already done. 3 topics of covered in this collaboration: soil analysis using satellite, satellite monitoring, monitoring of crop burning.
- Interested in the usage of cashew nut as material for livestock feed additives. This is a new topic for BBPSI.
- It is expected that collaboration leads to promotion of export. Export of mango from Indonesia to Japan is still prohibited due to certain requirement.

Next steps: BBPSI will create a matrix that comprises of selected key commodities from each department with key issues associated with those commodities. This will be shared with NRI SG, NRI SG can then assess the matrix and match this with the relevant technologies/solutions from certain Japanese companies for further action (piloting etc.). Further communication will be done via email.

インタビュー結果　サマリー

Indonesia | National Research and Innovation Agency (NRIA)

組織の概要
- National Research and Innovation Agency の食料・農業研究部門は、総合的な農業研究に携わる唯一の政府機関
- 食品・農業研究部門は、適正技術、家畜、農業産業、食用作物、加工食品など複数の研究センターを包含している

持続可能な農業に関する課題

小規模農家への技術・ソリューション普及
- 農村部にいる多くの小規模農家は、近代的な農法や技術を利用できないため、伝統的な農法を採用（*世代的農家*）
- また、若年層が農業に就くケースも減っており、今後の農業の持続性にも問題がある
- 近代的な農法と技術で農民の能力を向上させることが、短期的な収量格差に対処する最善の方法であると考えている

地域間の収量格差の格差是正
- 政府は、地域間の収量格差を縮小することを計画している
- 特にジャワ島以外の地域では、肥料や化学肥料、高品質の認証種子などの農業投入物の調達が困難

ロスの削減
- 農業において、現状ロスが約35～40％発生していると推定している
- 現在、同機関は果物や野菜を中心とした食品の成熟度を向上させるコーティング技術を開発

ニーズの高いソリューション
- 節水に資する水管理ソリューション
- 過剰使用傾向に対応する、環境負荷の低い農薬・肥料

外資企業の参入に対する示唆
- 主な流通経路は、農民のコミュニティや*Gabungan Kelompok Tani*（Gapoktan）を通じてである
- 自社の技術を説明する効果を高めるため、多くのスマート農業企業は、Gapoktanや地元自治体と協力している。

日本政府・企業への期待
- 高品質の種子開発、自動化・IoT化、輸出拡大に向けた高品質化の3分野での連携を期待
    - 自動化やIoT技術と組み合わせることができる栽培技術
- 連携に際しては、研究者への知識移転と農家への教育支援が必要
- NRIAは、インドネシアにおいて、日本の企業とともに農業技術のプロトタイプを開発での協力が可能
- 既にサカタのタネとは提携済み
    - 乾燥地向けの鑑賞植物の種子品種を開発

日本技術の潜在ターゲット仮説
- 米、果物、野菜のような食用作物を中心に添えるべき
- これらの作物は、政府が高い関心と重点を置いている戦略的食料品目であるため、今後の重点領域となる

Interview result for Indonesia | Research Organization

National Research and Innovation Agency

Organization information

- The Food and Agriculture research division of National Research and Innovation Agency is the sole-government agency that involves in end-to-end agricultural research.
- The food and agricultural research division encompasses several research centers such as Appropriate technology, Livestocks, AgroIndustry, Food Crops and Processed foods.

1. Background of Sustainable Agriculture Region in Indonesia

Social issues related to realization of Agriculture in the region.

- The major social issues associated with Sustainable Agriculture are the large number of smallholder farmers that are in rural and remote areas. These farmers have traditional farming method due to lack of access to modern method and the skill (*generational farmers).* Other than that, there is also an issue of continuation due to young farmers have low interest in working on the agriculture field.

Social issues of particular importance

- In terms of importance, the agency believes that upskilling the farmers capability with modern farming method and technology will serve as the best way to address the yield gap in the short term.

1. Background of Sustainable Agriculture Region in Indonesia (Cont'd)

Social issues of particular importance (cont'd)

- The agency realizes that agricultural technology is not fully disseminated to farmers and lack of operational capabilities. Furthermore, the price of agricultural technology is often very expensive to small scale farmers.

Overall Agriculture-related issues

- The government plans to narrow the yield gap across regions. As of now, Java still leads rice production which cause a large gap between Java and other regions.
- So, the main agricultural issues are difficulties in procuring agricultural inputs like fertilizer, chemical nutrients as well high-quality certified seeds. The agency observes that less than 50% of farmers use high-quality certified seeds.

Specific to Sustainable Agriculture

- As of now, the agency analyses that food losses in production and distribution is still the main issue. The Agro-Industry (Post-harvest) division estimated that the loss throughout that process is around 35-40%.
- In order to combat this, the agency is developing coating technology to improve the maturity of the foods, mostly fruits and vegetables. In addition, the key aspect is to develop high-quality seeds that has high resistance towards climate change impact.
- In terms of carbon emission, the agency is currently developing a low-emission crop variety, specifically in plantation sectors like palm oil or sugar cane. The agency plans to leverage this with the recently launched carbon credit or trading mechanism.

National Research and Innovation Agency

2. Demand for sustainable agriculture

Current market situation and market growth outlook

- The agency thinks that sustainable agriculture-related solution has a massive potential. This is mostly because sustainable agriculture addresses the major agricultural issues in Indonesia, which are land extensification (decreasing farming land) and farming intensification (poor farming management method).
- As of now, the sustainable agriculture-related solution has significant presence in post-harvest section. For pre-harvest, mechanization and distribution of agricultural inputs still have big presence.

Potential targets for related solutions/technologies

- The main target is towards smallholder farmers as they occupy the most of agricultural farms in Indonesia.

Potential solutions and technology needs related to sustainable agriculture

- Water-saving technology for interconnected irrigation.
- Less-pollutant pesticides because the agency observed that farmers often use fertilizer excessively. The presence of precision farming towards the use of drone fertilizer is still low. High-pollutant pesticides heavily impact the soil nutrients

Current/prospective price acceptance for related technologies /solutions

- In terms of pricing, price range is not the core focus of disseminating technology and solutions. The focus should be in composing a favorable financing scheme or payment method to farmers.
- For instance, many smart farming startups or company provide post-harvest payment to farmers. This allows farmers to protect their cashflows.

2. Demand for sustainable agriculture (cont'd)

Current leading distribution channel for sales(e.g. Agricultural cooperatives, farmer's community, etc.)

- The major distribution channel is mostly through farmer's community or *Gabungan Kelompok Tani (*Gapoktan). To increase effectiveness in explaining their technology, many smart farming companies collaborate with *Gapoktan* and local-municipal government. This helps companies to identify or determine key leaders that can influence the overall farmers.

Preferred method of promotion to local customers

- The main target is towards smallholder farmers as they occupy the most of agricultural farms in Indonesia.

Potential solutions and technology needs related to sustainable agriculture

- Plot demonstration is the most preferred method by farmers in terms of promoting agricultural technology. Through this demonstration, farmers can see firsthand the impact of the technology towards production yield or improving the nutrients.
- Plot demonstration is basically a small area of farming land that are leased for specified period for the companies to showcase its technology