



“รายงานพันธบัตร เพื่ออนุรักษ์สิ่งแวดล้อม ปี 2566”



environmental
protection

GREEN BOND REPORT 2023

ปลูกต้นไม้ สร้างรายได้ สร้างป่า

ข้อมูล ณ 30 พฤศจิกายน 2566



ธนาคารเพื่อการเกษตรและสหกรณ์การเกษตร
BANK FOR AGRICULTURE AND AGRICULTURAL COOPERATIVES

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Green Bond



The Green Bond of the Bank for Agriculture and Agricultural Cooperatives (BAAC) is a financial instrument that aims to support the bank's strategies in terms of integrated development on potential organizations and communities towards a sustainable foundation economy. Its strategic objective is to enhance the quality of life and environmental friendliness. In order to achieve this objective, the bank has established two environmental conservation credit projects, namely, the Go Green: Forest Credit and the Green Credit projects. In the 2020 fiscal year, the BAAC issued Green Bonds totaling 6,000 million baht with the purpose to fund the Green Credit projects and support the work plan previously mentioned.

Green Bond Framework

The Green Bond framework of the BAAC has been reviewed externally and subjected to pre-issuance assurance by Ernst & Young LLP Singapore, which is an independent international audit organization. The review concludes that the BAAC's Green Bond issuance process in the 2020 fiscal year aligns with the ASEAN Green Bond Standards (October 2018) and the International Capital Market Association Green Bond Principles (July 2018).

Green Bond Portfolio

In August 2020, the BAAC issued two tranches of Green Bonds totaling 6,000 million baht with the support of the British Embassy Bangkok under the ASEAN Low Carbon Energy Programme in providing an external reviewer (Ernst & Young LLP Singapore) to review both of the pre-issuance and the post-issuance of the bonds, as well as the support from the Public Debt Management Office (PDMO) under the Ministry of Finance in the bidding process of underwriters. As a result, the success of the aforementioned issuance made BAAC achieve to become the first Specialized Financial Institution (SFI) in Thailand that issues green bonds under the Security and Exchange Commission's (SEC) criteria for green bond filing and issuance. The details of the bonds are as follows:

| Bond Issuance Date | Maturity Date | ThaiBMA Symbol | ISIN | Currency | Coupon (p.a.) | Principal Amount (million THB) |
|--------------------|----------------|--|--------------|----------|---------------|--------------------------------|
| 19 August 2020 | 19 August 2025 |  BAAC258A | TH0651035808 | THB | 1.76 | 4,500 |
| 19 August 2020 | 19 August 2030 |  BAAC308A | TH065103A808 | THB | 2.76 | 1,500 |



Environmental Conservation Credit Projects (Eligible Green Projects)

The proceeds raised through Green Bond will be used exclusively to finance and/or refinance the eligible credit projects for environmental conservation as follows:

| Project Name | Go Green: Forest Credit Project by Green Bonds |
|---|---|
| Project Category | Forestry Category |
| Environmental Conservation Type: | Environmentally sustainable management of living natural resources and land use. |
| Principle and Rationale: | The board of directors of the BAAC at Meeting Report No. 3/2563 on 15 February 2020 approved for the BAAC to establish the Go Green: Forest Credit project to support the national strategies on promoting the sustainability of national biodiversity, environmental quality and natural resources and the bank's strategic plan toward becoming a sustainable bank while providing bank clients with a secure income and improved quality of life by matching funds with the Green Bond. |
| Project Purposes | <ol style="list-style-type: none"> 1. To provide working and/or investment capital for the cultivation of economically valuable tree and create a model for forestation according to project specifications. 2. To provide working and/or investment capital in the support of the cultivation of economically valuable such as the cultivation of saplings and/or seedlings for sale. 3. To create a source for greenhouse gas sequestration in order to achieve environmental balance by increasing the number of trees capable of absorbing carbon dioxide. 4. To restore or increase the cultivation areas of economically-valuable trees for producing sufficient quantities of wood for utilization in the country. 5. To support policies for eradicating inequality and forest encroachment and to make greater agricultural use of empty plots of land. |
| Source(s) of Capital: | Green Bond proceeds. |
| Project Duration | Loan disbursement from 1 April 2020 to 31 March 2025. |
| Project Target | 20,000 million baht total lending. |
| Cumulative disbursement from Green Bond Proceeds as of 30 November 2023 : | 303.80 million baht. |
| Environmental Impacts (Number of New Trees) | 962,379 trees. |
| Amount of Carbon Dioxide Sequestered ^{1/} (CO ₂ e) | 24,986.75 tons of carbon dioxide equivalents. |
| Production Area: | 12,131.41 rai. |



| Project Name | Green Credit Project by Green Bonds |
|---|--|
| Project Category | Environmental Conservation Category (Forestry Excluded) |
| Environmental Conservation Type: | <ol style="list-style-type: none"> 1. Environmentally sustainable management of living natural resources and land use. 2. Renewable energy. 3. Pollution prevention and control. 4. Sustainable water and wastewater management. |
| Principle and Rationale: | With the current changes in the lifestyles of the people with a consumer trend in favor of consumption of products that are safe for health and that are environmentally friendly, it became necessary for farmers to develop production processes with quality in line with international standards while reducing the use of chemicals to generate sufficient income to cover living expenses, thus making it necessary to adjust production and product consumption models to be consistent with the aforementioned guidelines. |
| Project Purposes | <ol style="list-style-type: none"> 1. To promote the production of organic or safe foods (food safety). 2. To promote the use of alternative, renewable or clean energy. 3. To promote natural resources and environmental conservation. 4. To develop the capabilities of the agricultural sector to enhance them for competition while immunizing the agricultural sector in favor of sustainable self-reliance. 5. To meet the needs of consumers who prioritize health and hygiene care while returning value to society to achieve stability, prosperity and sustainability. |
| Source(s) of Capital: | <ol style="list-style-type: none"> 1. Bank capital sources. 2. Green Bond proceeds. |
| Project Duration | Loan disbursement from 1 January 2018 to 31 March 2028. |
| Project Target | 35,000 million baht total lending. |
| Cumulative disbursement from Green Bond Proceeds as of 30 November 2023 : | 11,588.82 million baht. |
| Environmental Impacts | |
| Objective 1 | Production of organic or safe foods (food safety). |
| Project Indicator (Production Volume) | 743,677.47 tons. |
| Project Indicator (Production Area) | 167,016.25 rai. |
| Objective 2 | Use of alternative / renewable / clean energy. |
| Project Indicator (Amount of Electricity Generated) | 3,545.29 MW. |
| Project Indicator (Number of Facilities/ Factories/ Projects/Work Plans) | 1,594 facilities/factories/projects/work plans. |



| | |
|--|---|
| Objective 3 | Natural resource and environmental conservation. |
| Project Indicator (Number of Facilities/Factories, Projects/Work Plans) | 443 facilities/factories/projects/work plans. |
| Project Indicator (Production Area) | 11,285.36 rai. |



Allocation of the Green Bond Proceeds

Data as of 30 November 2023

| Credit Fund | Allocation of the Green Bond Proceeds ^{1/} (million THB) | Cumulative Lending Amount | | | Outstanding Balance | | | Available Green Bond Proceeds ^{2/} | |
|--|--|---------------------------|-------------------------|----------------------|-----------------------|------------------------|---------------------|---|---------------------|
| | | No. of Loan Contracts | Amount (million THB) | (%) | No. of Loan Contracts | Amount (million THB) | (%) | (million THB) | (%) |
| 1. Go Green: Forest Credit Project | 400.00 | 1,228 | 303.80 | 75.95 | 849 | 228.53 | 57.13 | 171.47 | 42.87 |
| 2. Green Credit Project | | | | | | | | | |
| 2.1 Production of organic or safe food products. | 4,400.00 | 6,040 | 9,712.60 | 220.74 | 3,259 | 4,000.32 | 90.92 | 399.68 | 9.08 |
| 2.2 Use of alternative / renewable / clean energy. | 650.00 | 1,893 | 766.22 | 117.88 | 1,381 | 425.44 | 65.45 | 224.56 | 34.55 |
| 2.3 Natural resource and environmental conservation. | 550.00 | 1,087 | 1,110.01 | 201.82 | 451 | 323.33 | 58.79 | 226.67 | 41.21 |
| Total | <u>6,000.00</u> | <u>10,248</u> | <u>11,892.63</u> | <u>198.21</u> | <u>5,940</u> | <u>4,977.62</u> | <u>82.96</u> | <u>1,022.38</u> | <u>17.04</u> |

Remarks: ^{1/} The Allocation of the Green Bond Proceeds may be adjusted as appropriate to the situation and future loan disbursement.

^{2/} The Available Green Bond Proceeds (if any) is held in cash, cash-equivalent transactions and money market investment.

^{3/} There was a reduction in number of customers who resigned from the project.



Environmental Benefits

Data as of 30 November 2023

| Credit Project | Project Environmental Impact Performance | | | | | | |
|--|---|--------------------------|-----------------------|---|--------------------------|--------------------------------------|--|
| | Accumulated Project Credit Disbursement (million THB) | Production Area (rai) | No. of Trees | Carbon Sequestration (tons of carbon equivalents) ^{1/} | Production Volume (tons) | Amount of Electricity Generated (MW) | No. of Production Plots/Facilities/Factories |
| 1. Go Green: Forest Credit Project | 303.80 | 12,131.41 | 962,379 | 24,986.75 | - | - | - |
| 2. Green Credit Project | | | | | | | |
| 2.1 Production of organic or safe food products. | 9,712.60 | 167,016.25 | - | - | 743,677.47 | - | - |
| 2.2 Use of alternative / renewable / clean energy. | 766.22 | 26,068.93 | - | - | - | 3,545.29 | 1,594 |
| 2.3 Natural resource and environmental conservation. | 1,110.01 | 11,285.36 | - | - | - | - | 443 |
| Total | <u>11,892.63</u> | <u>216,501.95</u> | <u>962,379</u> | <u>24,986.75</u> | <u>743,677.47</u> | <u>3,545.29</u> | <u>2,037</u> |

Remarks: ^{1/} CO₂e Sequestration Formula (T-VER Project by the Thai Greenhouse Gas Management Organization): Carbon Sequestration Amount (Carbon Dioxide Tons-Equivalent) = Number of Trees x Number of Years of Operation (from the year of planting) x 9.5 Kilocarbon Dioxide x 10⁻³

^{2/} There was a figure adjustment according to the updated situation. For example, a reduction of customers who resigned from the project. Improvement on productivity by area, appropriate unit adjustment including the record of production volume by annual output.

**Appendix****^{1/} Carbon Sequestration**

Carbon sequestration capabilities depend on the growth rate of trees, by which environmental factors influence the growth of trees. If the trees are planted in a suitable area, the trees will grow and be able to sequester a large number of greenhouse gases. The estimates of greenhouse gas sequestration by trees as compiled from related research under the assumption that "trees grow at the same rate each year" are summarized in the following table:

| Table of Carbon Sequestration in the Overall Biomass by Tree Type/Category | | | | | |
|---|-----------------------|-----------------------------|------------|------------|------------|
| Tree Type/Category | Area Potential | Carbon Sequestration | | | |
| | | (1) | (2) | (3) | (4) |
| Teak | High | 0.59 | 3.67 | 2.16 | 13.44 |
| | Medium | 0.47 | 2.94 | 1.72 | 10.77 |
| | Low | 0.37 | 2.32 | 1.36 | 8.49 |
| Eucalyptus | High | 1.66 | 10.37 | 6.09 | 38.03 |
| | Medium | 1.30 | 8.13 | 4.77 | 29.82 |
| | Low | 0.86 | 5.38 | 3.15 | 19.73 |
| Acacia Mangium | High | 1.66 | 10.39 | 6.09 | 38.09 |
| | Medium | 1.20 | 7.54 | 4.40 | 27.64 |
| | Low | 1.09 | 6.82 | 4.00 | 25.00 |
| Acacia Auriculiformis | High | 1.20 | 8.64 | 4.40 | 31.68 |
| | Medium | 0.95 | 5.92 | 3.48 | 21.71 |
| | Low | 0.62 | 3.91 | 2.27 | 14.32 |
| Leucaena Leucocephala | High | 1.77 | 11.32 | 6.49 | 41.51 |
| | Medium | 1.31 | 8.40 | 4.80 | 30.82 |
| | Low | 0.21 | 1.37 | 0.77 | 5.02 |
| Rhizophora Mucronata | Not specified | 0.75 | 4.71 | 2.75 | 17.25 |
| Natural rubber | Not specified | 1.15 | 7.20 | 4.22 | 26.39 |
| Oil palm | Not specified | 0.68 | 4.28 | 2.49 | 15.69 |
| Forest trees (slow-growing trees) | Not specified | 0.26 | 1.61 | 0.95 | 5.91 |
| Edible fence trees | Not specified | 0.40 | 2.50 | 1.47 | 9.17 |
| Roadside trees | Not specified | 0.33 | 2.05 | 1.21 | 7.52 |

Remarks:

- (1) Unit in tons of carbon/rai/year.
 - (2) Unit in tons of carbon/hectare/year.
 - (3) Unit in tons of carbon/rai/year.
 - (4) Unit in tons of carbon/hectare/year.
- Sequestration calculated from tree-planting density of 100 trees/rai.



The amount of greenhouse gas sequestration can be calculated from the relationship of the total growth and height of trees by using an equation developed by researchers called an "allometric equation". The result from the equation represents the biomass of trees.

The biomass of trees calculated can be used to estimate the amount of carbon in the trees by multiplying with the "carbon content" of the trees and converting the unit to "tons of carbon dioxide equivalents per year", which is the unit used to represent the amount of greenhouse gas.

The Thailand Greenhouse Gas Management Organization (Public Organization) or TGO is the primary agency with responsibilities in the promotion and support for activities aimed at reducing greenhouse gas emissions and has created a tool for evaluating carbon sequestration above ground and underground by trees in the project areas. It can be used in projects requiring greenhouse gas sequestration estimates for forestry-related projects and/or projects requiring carbon sequestration estimates for trees planted or growing naturally inside project areas. The latest version of the calculation tool can be downloaded at <http://ghgreduction.tgo.or.th/tver-method/tver-tool/for-agr.html>

The BAAC has established credit projects that use proceeds from Green Bonds in the forestry category named the "Go Green: Forest Credit" project and has created a project performance report on environmental impacts, whereby the amount of carbon sequestered has been specified to be calculated by using the carbon sequestration formula according to the standards for the voluntary greenhouse gas emission reduction program (T-VER) of the TGO in **Option 1, Item 4** of the T-VER-TOOL-FOR/AGR-01 Version04 Calculation for Carbon Sequestration (No. 4).

Calculation Formula

| |
|---|
| <p>Amount of Carbon Sequestration (tons of carbon dioxide equivalents) = Number of Trees x Number of Years of Operation x 9.5 Kilos of Carbon Dioxide x 10⁻³</p> |
|---|

References

Clean Development Mechanism (CDM)

1. Estimation of carbon stocks and change in carbon stocks of trees and shrubs in A/R CDM project activities (AR-TOOL14 Version 04.2)
2. 2006 IPCC Guidelines for National Greenhouse Gas Inventories: Volume 4 Agriculture, Forestry and Other Land Use
3. Tree Potential Manual for Promotion under the Forestry Clean Development Mechanisms Project, 2011



Reporting

The BAAC will report the allocation of Green Bond Proceeds and report the impact on the environment from the implementation of the credit projects every year, until the maturity of the bond.



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