

Financing Sustainable  
Landscapes:

# Mato Grosso, Brazil

EXECUTIVE SUMMARY

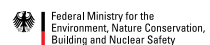


The Unlocking Forest Finance (UFF) Partnership includes NGOs, environmental and social sector safeguarding institutes, financial sector experts and strategic advisors including Credit Suisse, European Investment Bank and Althelia Ecosphere. UFF is managed by the Global Canopy Programme, a UK nonprofit with a strong track record of implementing international projects to address tropical deforestation. The project also relies on a number of global and local partners: Companhia de Desenvolvimento de Serviços Ambientais, Acre (CDSA), the Amazon Environmental Research Institute, Mato Grosso (IPAM), Centro de Desarrollo e Investigación de la Selva Alta, San Martín (CEDISA), National Agricultural University of La Molina (UNALM) in San Martín, World Wide Fund for Nature (WWF-UK, and other WWF offices), Climate Bonds Initiative (CBI), Vivid Economics, Helmholtz Centre for Environmental Research (UFZ), the International Institute for Sustainability (IIS), the International Institute for Applied Systems Analysis (IIASA), The National Institute for Space Research – Centre for Earth Systems Science (INPE-CCST).

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Supported by:



based on a decision of the German Bundestag

# Executive Summary

## The business case for investing in sustainable supply chains and conservation activities

Mato Grosso (MT) is a global agricultural powerhouse. With an area of more than 900,000 km<sup>2</sup>, the state is Brazil's largest producer of soy, corn, cotton, and cattle. In just over a decade, the state's GDP has risen from

R\$12.3 billion (1999) to R\$80.8 billion (2012), an increase of 554 percent mostly driven by agriculture, the State's main activity. In the same period, Brazil's GDP grew by 312 percent<sup>1</sup>. Agriculture, livestock, and timber production are expected to continue to undergo significant growth. The government of Mato Grosso recognizes the challenge of increasing production whilst minimizing negative social and environmental effects and launched the Produce, Conserve, Include (PCI<sup>2</sup>) Strategy at COP21 in Paris with this in mind. The strategy aims to integrate objectives across agriculture, environmental conservation and social inclusion. The Unlocking Forest Finance project (UFF<sup>3,4</sup>) works to aid this strategy through the development of business cases that supporting the transition to sustainable land use in Mato Grosso. These business cases are based on increasing the productivity of certain supply chains, strengthening conservation activities, and improving the livelihoods of the most vulnerable populations.

Implementing the PCI strategy can bring significant benefits to the region and the country, but it also has upfront costs that need to be funded. In addition, funding sources will require a clear idea of where the resources will be invested and what the potential is behind the program. The Unlocking Forest Finance project has prepared the business case for investment in interventions that can support the implementation of the PCI.

<sup>1</sup> According to data from the IBGE (Brazilian Institute of Geography and Statistics)

<sup>2</sup> Presentation of the PCI strategy from the State of Mato Grosso to the Instituto Teotônio Vilela and PSDB on 4/5/2016. Available at: <https://prezi.com/kdxh3khh-kixr/estrategia-pci-051016/>. Accessed on 10/5/2016.

<sup>3</sup> More details on the project can be found at: GCP, 2015. Available at: <http://globalcanopy.org/projects/unlocking-forest-finance>. Accessed on 10/3/2015

<sup>4</sup> The project, led by the Global Canopy Program, with IPAM [Amazon Environmental Research Institute] as an implementing partner in Mato Grosso, has 13 partner institutions and takes places in three different regions: Mato Grosso and Acre, Brazil and San Martín, Peru.

## Defining the interventions

The Unlocking Forest Finance project was launched in 2013, and partnered with the government of the State of Mato Grosso, through the State Secretariat of Environment. The project's first step was to identify the activities (production, conservation, and sustainable livelihoods) that can contribute to the economic development of the state whilst delivering social and environmental benefits. Between 2013 and 2016, UFF conducted 115 interviews with 42 institutions to identify these activities. For each activity, the project developed a sustainable scenario where proposed interventions are implemented. The sustainable scenarios were not based on a projection of market demand, but rather on the views of key actors in each sector of the future of each activity, the obstacles faced, and how each activity could be improved.

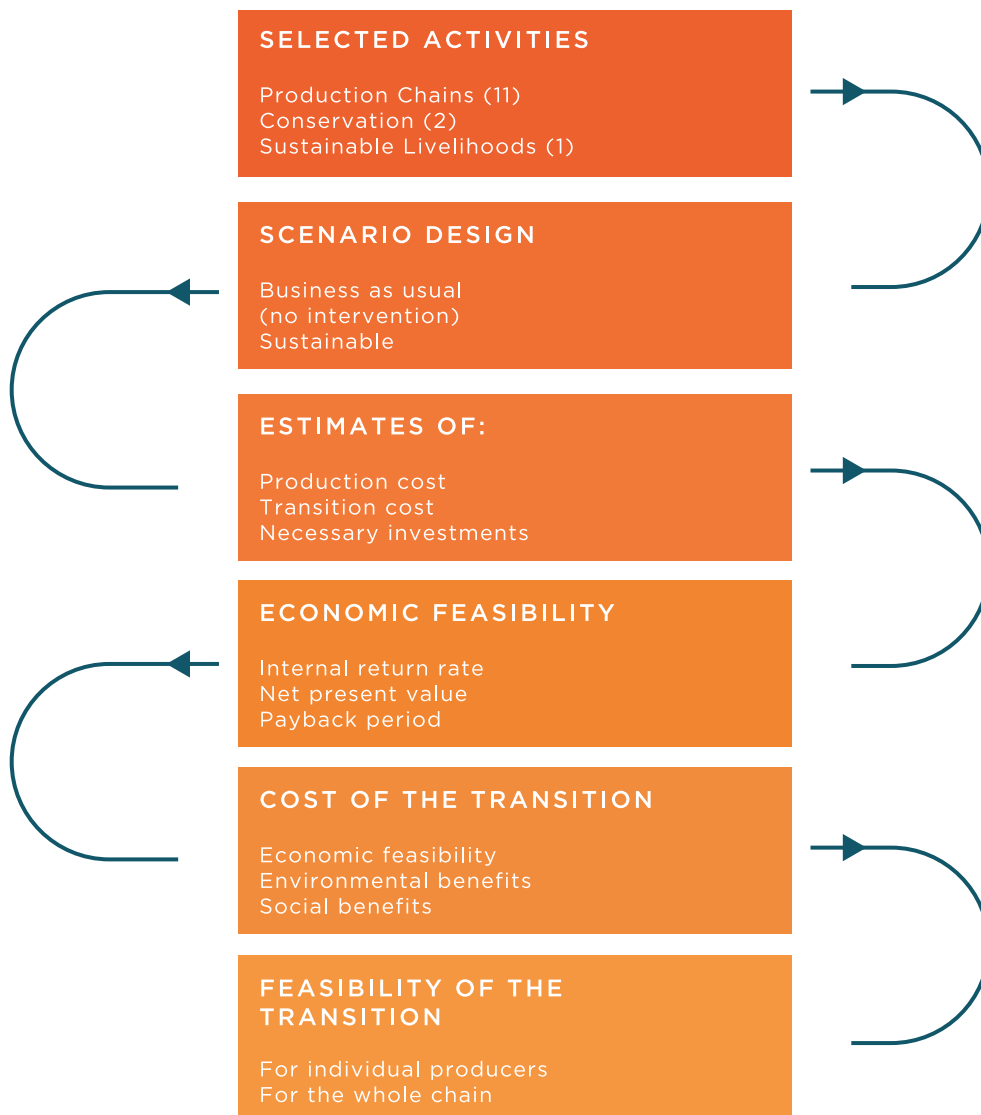


Figure 1. Steps to build the business cases in Mato Grosso

A preliminary analysis considered 26 activities: 14 linked to supply chains (production), 5 conservation activities (conservation), and 7 socio-biodiversity activities (inclusion). These were narrowed down to 14 priority activities which were assessed in depth based on social and environmental impacts, the size of the area occupied by the activity, government priorities and the availability of data.

Future scenarios (these consider assumptions on area to be affected by the interventions, productivity to be achieved and the producers to be involved) were developed for each activity selected. These were the business-as-usual scenario (BAU) of what would happen without intervention and the sustainable scenario, which projected the expected outcomes of implementing sustainability-focused investments and incentives.

The project estimates that implementing the transition to the sustainable scenario for all activities will lead to a host of benefits by 2030, such as:

- Reducing demand for pasturelands by approximately 7 million hectares, by significantly increasing productivity. This area can then be occupied by crops (4 million ha) that otherwise would have generated pressure on forests and forests (450,000 ha). This helps alleviate pressures to open new areas and therefore reduces deforestation;
  - In soy, reducing the use of agrochemicals and harvest losses, thereby increasing productivity;
  - Supporting the recovery of 3 million hectares of mandatory legal reserve and permanent preservation areas in pasture and soy areas;
  - Increasing sustainably managed native forests from 2.8 to 6 million hectares;
  - Increasing the income of nearly 45,000 smallholders in farms and extractive activities in dairy cattle farming, rubber cultivation, agroforestry systems, fish farming and Brazil nut supply chains;
  - Improving the protection of 4.9 million hectares of protected areas and 20 million hectares of indigenous lands.
- focusing on dairy cattle farming, rubber cultivation, agroforestry systems, fish farming and Brazil nut supply chains;
- Improving the protection of 4.9 million hectares in protected areas and 20 million hectares on indigenous lands.

## Building the business cases

UFF calculated the costs and potential financial returns of transitioning towards the sustainable scenario. Cash flow analyses helped assess the feasibility of reaching the projected demand for key deforestation risk commodities whilst using less area for cultivation, as well as the potential for increasing jobs and income at the farm level. In addition, an environmental impact assessment helped to identify environmental benefits and risks of implementing the transition.

The results show that the transition is attractive from all perspectives<sup>5</sup>, and the state government is showing its support for this through the inclusion of ambitious goals in the PCI<sup>6</sup>. Achieving these results depends on public and private investment.

According to estimates in this study, approximately R\$50.7 billion (or a discounted cost of R\$26.8 billion) in additional financing will be required for investment in crops, livestock and forestry. Loans in the form of credit lines can come, in large part, from the Plano ABC [ABC Plan] and PRONAF [National Program to Strengthen Family Farming]. If the costs of protected areas are included, the total cost for the transition in MT over the next 15 years will be around R\$53.4 billion (or a discounted cost of R\$28.6 billion). The amounts refer to both production and processing, and include the cost of machinery, facilities, improvements, production inputs, and all other operational costs, including but not limited to personnel, inputs and energy.

The results of the economic analyses show that the production systems in the study are financially feasible, not only for individual producers, but also as part of a large-scale transition strategy over the next 10 to 15 years<sup>7</sup>. For most of the supply chains, the private sector is likely to be able to finance sector investments such as technical assistance services and capacity building for the proposed transition. This shows the potential for attracting private capital to help fund the implementation of the PCI. The next challenge is defining the financial mechanisms to make this transition feasible, through existing credit lines, private investment, or blending different kinds of financing, such as concessional loans, grants, and market rate loans.

## Agricultural production and extractivism

### Beef Cattle Farming

The beef cattle farming transition considers properties with an initial pasture area of 1,000 hectares (medium-sized producers) with the potential to intensify production, so that the initial herd (1,000 Animal Units) would require only 500 hectares. An average environmental liability of approximately 177 hectares is estimated. The intensification simulation for a producer has been demonstrated to be economically viable with a payback of six years after the investment by increasing the productivity from level 1 (64.5 kg/ha/year) to level 2 (157.5 kg/ha/year). On this basis, the gradual transition of all Mato Grosso medium-sized producers (of which there are estimated to be 14,700) would be economically feasible in a 15-year time period with an internal return rate (IRR) of 18.9 percent, a net present value (NPV) of R\$2.67 billion<sup>8</sup> and a return on investment (payback) period of 11 years.

<sup>5</sup> The full publication explains the scenarios for each one of the activities in detail, shows the business-as-usual and sustainable scenarios, an estimate of economic feasibility for the individual producer and the supply chain, and the environmental, social, and economic benefits of each transition.

<sup>6</sup> Main goals of the Produzir, Conservar e Incluir (PCI) program for 2020-30:

- Replace 6 million hectares of degraded pastures by 3 million hectares for grain cultivation, 2.5 million hectares for intensified pastureland, and 500,000 hectares of planted forests.
- Increase from 2,8 to 6 million hectares of sustainable forest management areas.
- Maintain 60% of the state's native vegetation.
- Reduce deforestation by 90% in the Amazon and 95% in the Cerrado (tropical savanna landscape)
- Eradicate illegal deforestation by 2020.
- Offset 1 million hectares of land susceptible to deforestation.
- Recover 2.9 million hectares of permanent production areas.
- Increase the production share of local family farming from 20% to 70% in the state.
- Promote land regularization in 70% of family farming plots.
- Provide 100% of small producers with technical assistance.
- Increase the family farming credit from R\$411 million/year to R\$1.3 billion per year.

<sup>7</sup> The analyses were carried out to estimate impacts for producers and activities in Mato Grosso in general. For this reason, they may not accurately represent the profitability of the sector, as averages were used.

<sup>8</sup> In a scenario where restoration is used to a larger degree than liabilities, these numbers will fall.

The transition would reduce pasturelands by 7.3 million hectares and recover 1.9 million hectares of environmental liability. Given the cultural barriers associated with intensification, it is necessary to invest in large-scale training and rural extension programs, at an estimated cost of R\$73 million. The total cost of the transition for the beef cattle supply chain is estimated at R\$24.8 billion (a non-discounted amount), assuming that all medium-sized producers would reduce their pasturelands by 500 hectares.

## Sustainable Management of Native Forests

Forest management is an activity that can be very attractive from an economic and environmental standpoint, provided that illegal timber harvesting can be reduced in the state. The transition considered the implementation of the Sustainable Forest Development Program (from Portuguese Programa de Desenvolvimento Florestal Sustentável - PDFS). This plan aims to increase the sustainability of the supply chain as a whole by increasing timber harvesting in native forests with sustainable forest management plans (PMFS), from the current 2.8 million hectares under management to 6.0 million hectares by 2030.

The sustainable transition results show economically feasible 15-year investment projects with a 12.2 percent IRR, a R\$268 million NPV, and an 11-year payback period. PDFS-MT actions must be implemented, and the Plano de Suprimento Sustentável (PSS) [Sustainable Supply Plan] must be put into operation<sup>9</sup>, with a cost estimated at R\$126 million in this study. Required actions include promoting technical assistance, reviewing the legal and institutional framework, developing technology, and boosting market training and development. The total cost of the transition is estimated at R\$2.7 billion, the equivalent of a 3.2 million-hectare increase of PMFSs.

## Planted Teak and Eucalyptus Forests

The PCI seeks to increase the number of hectares of planted forests to 800,000 by 2030. In this study, the scenario designed with sector representatives predicts that the area of planted teak and eucalyptus will increase from 251,000 hectares in 2013 to 701,000 hectares in 2030.

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<sup>9</sup> The *Plano de Suprimento Sustentável* (Law 12.651/2012) has the objective of ensuring that the processing industry uses legally- and sustainably-sourced raw forest materials. One of the guiding actions serves to prevent illegal logging, since reducing competition from illegal timber renders the PMFSs more profitable.

The simulation indicated this to be economically feasible at an IRR of 14.8 percent, with an NPV of R\$4 billion for teak (25-year investment term), and a 13.21 percent IRR and R\$968.5 million NPV for eucalyptus (20-year investment term). For this to occur, the PDFS actions and PSS implementation must take place as described above. The total transition cost is estimated at R\$13 billion, of which R\$5.9 billion is for teak and R\$7.1 billion for eucalyptus.

## Soy

Based on consultations with sector representatives, the transition in soy production takes place by cutting back on fertilisers, pesticides, and herbicides, through the use of new technologies coupled with integrated pest management to reduce harvest losses, and by regularising environmental liabilities for all owners of medium-sized properties (estimated at 3,800 properties, with areas ranging from 400 to 1,500 ha).

The transition only proves to be economically feasible if producers can reduce the use of fertilisers, pesticides, and herbicides for a period of up to two years. For this estimate, an average liability of 269 hectares per producer has been assumed. However, the economic feasibility would be reduced if this number were higher. In these conditions, the transition is economically feasible with a 15-year investment term with a 20.2 percent IRR, a R\$790.2 million NPV, and an 11-year payback period. Sector investments were estimated at R\$62.1 million in technical assistance and extension services. The total cost is estimated at R\$ 3.7 billion for 1.5 million hectares.

## Swine

For swine farming, the transition considered the implementation of waste treatment via composting plant technologies for all 349 medium-sized producers of Mato Grosso (approximately 950 animals per farm) and via small biogas systems for all the 17,000 small producers (around 70 animals). Waste treatment reduces soil contamination and methane emissions, uses methane to generate energy and provides manure to be used by other supply chain activities.



The simulation was not economically feasible in the transition period of the study, although if cost-savings of such technologies and/or policies and incentives that increase waste treatment are considered, the transition could become economically feasible in the future.

## Smallholder farming (Family farming)

### Dairy Cattle Farming

Dairy cattle farming takes place on many of the state's small properties, but their productivity is low. For this case study, the transition occurs through intensification, with an increase in the average productivity of cows. The simulation considers 5,100 small properties, each one covering approximately 27 hectares. After the intensification process, the properties use only five hectares to maintain the cows, generating a productivity increase of 370 percent.

The transition simulation was economically feasible over a 15-year period, at an IRR of 26.6 percent, an NPV of R\$287 million, and a nine-year payback term. In environmental terms, the transition would allow pasture to be reduced by 260,000 hectares over a 10 year period. This study estimates that sector investment with technical assistance, rural extension, and demonstration units totaling R\$60.1 million will be necessary. The total transition cost is estimated at R\$787.3 million.

### Rubber Cultivation and Agroforestry Systems (AFS)

Another activity studied for small producers is the implementation of rubber cultivation and agroforestry systems. The transition from the current 40,000 hectares of planted rubber trees to 88,000 hectares, as well as from the current 1,600 hectares to 22,000 hectares of agroforestry systems (cacao, banana and rubber trees), has been demonstrated to be economically feasible over an investment period of 25 years, with a total NPV of R\$918 million for both activities. The IRR was 11.2 percent for rubber cultivation and 18.9 percent for agroforestry systems.

Despite appearing unattractive due to the long investment recovery period, the activities should be carried out alongside other short-term activities (such as dairy farming or fish

farming, amongst other options), in order to increase the producer's income and reduce the risk of losses through diversification of productive activities. The transition proposed can deliver enormous social benefits for nearly 30,000 producers. Necessary sector investments to aid with technical assistance, rural extension, demonstration units and the creation of seedling nurseries was estimated to have a total cost of R\$47.5 million for rubber cultivation and R\$11 million for agroforestry systems. The total cost of the transition is estimated at R\$3.7 billion.

## **Aquaculture (Fish Farming)**

Mato Grosso is Brazil's largest producer of fish farmed in tanks. The transition was focused on the production and processing of fish of 675 micro producers in the Cuiabá and Várzea Grande municipalities of Mato Grosso as this region has most of the small producers of the state area. The economic simulations indicated that when considering the extension services required for all of the producers to transition the sustainable model, financing this transition was not markedly attractive (an IRR of just 8.3 percent and NPV of R\$162,000). This was attributed to the high costs of technical assistance and rural extension (estimated at R\$17.5 million) when compared to the low cash flow generated by the activity. Nevertheless, when considering the feasibility of the transition for producers, they would be able to increase their income from around R\$3,800 to R\$13,300 per year in just two to three years. Because those producers do not need to pay for fish tanks, their upfront capital investments are low, and as a result IRR is quite high at above 30 percent.

This transition is possible since local municipalities have already subsidised production by donating tanks to the region's producers. With appropriate sector investments through technical assistance and rural extension, the transition will enable a regional production increase from approximately 1,500 to 5,000 tons per year, while contributing to a more inclusive local economy. The total transition cost is estimated at R\$140 million.

## Extractivism

### Brazil Nut

The Brazil nut chain has great potential. This simulation has considered an 800 tonne per year increase in harvesting and processing over a ten-year period. The results are economically feasible over a 15-year investment period, with an IRR of over 30 percent, a R\$16.7 million NPV, and an eight-year payback term. If implemented, the transition can generate income for around 500 forest dwelling and indigenous families and local communities. Sector investments with extension services, marketing and regulatory framework development for Brazil nut picking has been estimated at a total cost of R\$14 million. The total cost of the transition is estimated at R\$96 million.

## Conservation (Protected Areas)

The state's protected areas play a key role in maintaining climate regulation, preserving native vegetation and biodiversity and regulating the water cycle. The transition considered here seeks to consolidate federal and state conservation units (CUs), except those located in urban areas.

The estimate amount is R\$2.1 billion. This includes R\$2 billion for land regularisation and R\$114 million over the next 10 years for operational expenses (personnel, equipment maintenance, inputs, etc.) as well as additional investments (physical structure, vehicles, signs, etc.). In total, the seven federal and 46 state conservation units cover an area of nearly 4.9 million hectares. Their consolidation helps to reduce fires and land invasions, avoid illegal timber harvesting, ensure the preservation of ecosystem services and increase the region's potential for tourism.

## Sustainable Livelihoods

### Indigenous Peoples

Indigenous people occupy an area of 21 million hectares in Mato Grosso<sup>10</sup>. The transition proposed entails the implementation of the National Territorial and Environmental Management Policy for Indigenous Lands (from Portuguese, Política Nacional de Gestão Territorial e Ambiental de Terras Indígenas - PNGATI) on all of the state's 85 indigenous lands. The PNGATI projects the protection, recovery, conservation, and sustainable use of natural resources from indigenous lands and territories. This will be accomplished through the creation and implementation of management plans that incorporate knowledge possessed by indigenous people, promote dialogue with other institutions, help protect the land and natural resources, promote the sustainable use of these resources, and foster economic alternatives and alternative income sources for these populations.

The transition over the next 10 years has an estimated cost of R\$418 million. If implemented, the transition will lead to better environmental protection of indigenous lands, which currently are home to around 41,000 indigenous people.

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<sup>10</sup> Given that some of the indigenous lands in MT border other states, the proportional area of these lands in Mato Grosso is lower.

