FABLAB PERU

WYSS ACADEMY FOR NATURE

How is the industry performing in Tambopata, Madre de Dios, Peru?

The Amazon rainforest in Madre de Dios has great potential for developing quality products and services, combining:

- *Multiculturality*
- *Technology*
- *Biodiversity*

But if companies do not promptly adopt new technological processes, they will be left out of global markets, and **competitiveness gaps will continue to grow.**

To analyze the industrial maturity in **key sectors** of the region—such as Amazon nuts, tourism, agroforestry, and Artisanal and Small-scale Gold Mining (ASGM)—**the Wyss Academy for Nature and FabLab Peru** created the program ***Amazonía 5.0: Bridging the Gap to the 5th Industrial Revolution*** which aims to:

- *Measure the industrial development levels of participating businesses using the Industrial Maturity Index (IMI).*
- *Establish an efficient roadmap for businesses to bridging the gap to Industry 5.0.*

Participants:

29 *Amazon nut businesses*

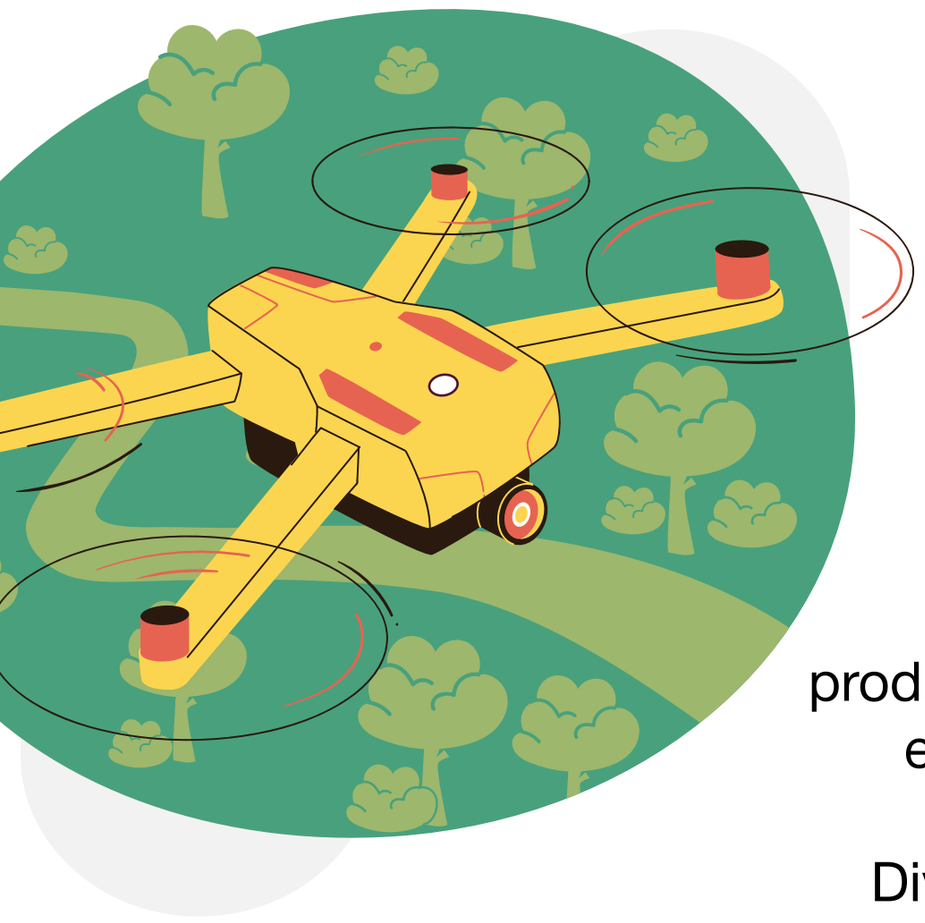
26 *Agroforestry businesses*

20 *Tourism businesses*

13 *ASGM businesses*

To measure the industrial maturity of companies in Tambopata, we use the Industrial Madurity Index (IMI).

This tool, developed by FabLab, aims to assess where companies fall on the scale from Industry 1.0 to Industry 5.0.



Advanced technology. Regenerative processes. Circular economy with social impact. Hyperconnected, decentralized, and adaptive companies.

IMI: 5.0

5th Industrial Revolution

Emergente

High Resilience

Automation of production through electronics and digitalization. Diversification of business models, with responsiveness to changes.

IMI: 3.0 to 3.9

3rd Industrial Revolution

s. XX - s. XXI

4th Industrial Revolution

s. XXI - Presente

IMI: 4.0 to 4.9

Advanced automation using AI, Internet of Things, and Big Data. Agile and personalized models. High capacity to adapt to global changes.

Production based on mechanical devices. Dependence on labor and natural resources. Limited flexibility to abrupt changes.

IMI: 1.0 to 1.9

1st Industrial Revolution

s. XVIII - s. XIX

2nd Industrial Revolution

s. XIX - s. XX

IMI: 2.0 to 2.9

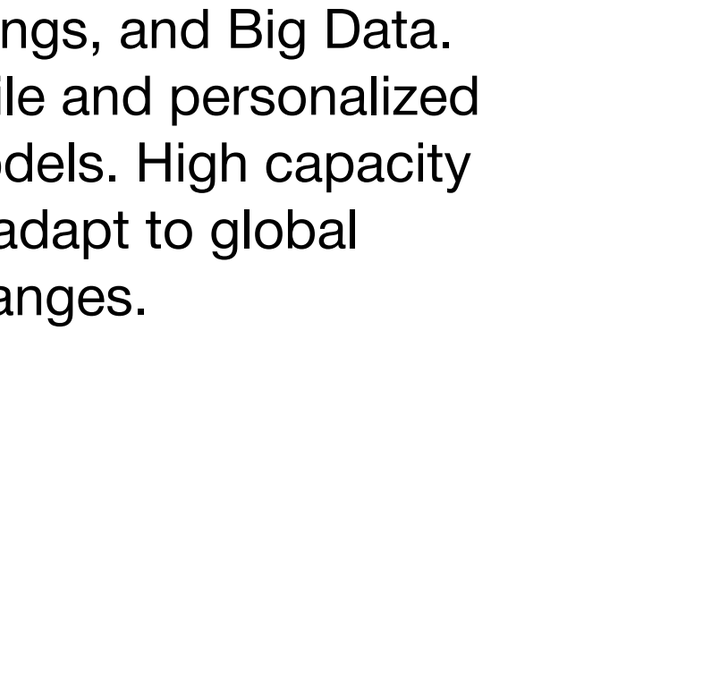
Mass production, expansion of global markets, and large corporations. Greater efficiency, yet still rigid.

Low Resilience

The IMI allows us to:

Observe *the types of production and technologies used by the participating businesses, and interpret this information in terms of years of technological lag.*

Identify and strengthen *an enterprise' ability to face challenges, adapt to change, and thrive in a dynamic business environment.*



Measure the industrial development levels of participating businesses using the Industrial Maturity Index (IMI).

Product/Service Management: *Assesses the planning, development, production, and marketing of their products.*

Resource Management: *Evaluates how human and material assets are managed to achieve organizational goals.*

Information Management: *Assesses how internal and external information is handled to support decision-making.*

Organizational Management: *Evaluates the organization's ability to define roles and responsibilities, manage internal communication, and adapt to changes in the business environment.*

Innovation Management: *Assesses how innovation is encouraged and managed across processes, products, and services.*

What is the level of industrial maturity of the key sectors in Madre de Dios in relation to the 5th Industrial Revolution?

Amazon nut

IMI of 2.47 equivalent to ***-71 years***

Agroforestry

IMI of 1.78 equivalent to ***-115 years***

Tourism

IMI of 2.57 equivalent to ***-69 years***

ASGM

IMI of 1.57 equivalent to ***-136 years***

Characteristics of the 2nd and 3rd Industrial Rev.

Characteristics of the 1st and 2nd Industrial Rev.

The IMIs of these four key sectors are characterized by:

Product Management:	• *Manual production processes.* • *Mass-produced, non-standardized products.*
Resource Management:	• *Use of fossil energy.* • *Linear economy.*
Information Management:	• *Analog data collection and monitoring.* • *Information stored physically.*
Organizational Management:	• *Hierarchical structure.*

And the difference between sectors are:

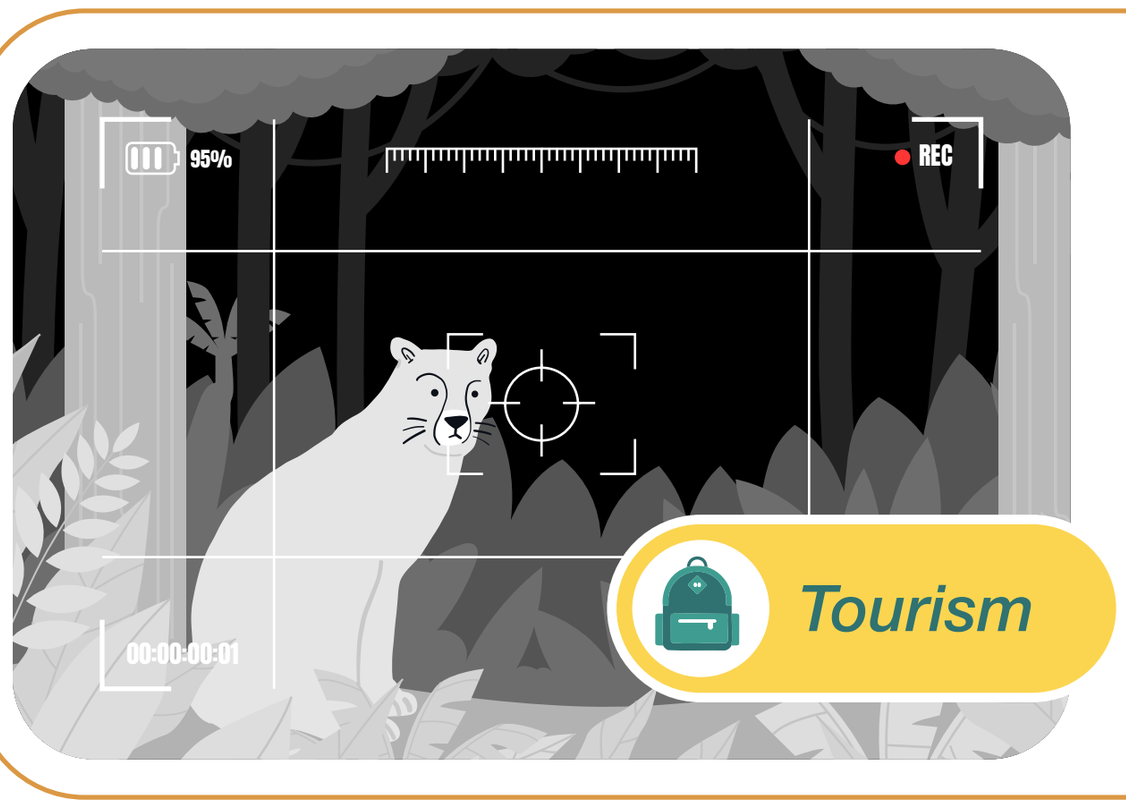
Organizational Management:	• *Local market for mining (ASGM) businesses and national market for the agroforestry sector.* • *International market for businesses in the Amazon nut and tourism sectors.* • *Mining and agroforestry businesses do not have established protocols.* • *Amazon nut and tourism businesses have established protocols, which are shared in an analog format.*
Innovation Management:	• *Amazon nut, tourism, and agroforestry businesses have a dedicated innovation office or intellectual property (IP) assets.* • *In the mining (ASGM) sector , innovation is centralized around the owner or creative leader of the business, and they do not have IP assets.*

In summary, businesses in these sectors face 3 main challenges:

1. ***Limited capacity*** *to compete in dynamic markets.*
2. *Generate* ***few benefits*** *for nature.*
3. ***Lack mechanisms*** *to generate new products and/or services.*

Recommendations for bridging the gap to the 5th Industrial Revolution:

- ***Digital transformation*** *without losing the artisanal touch.*
- ***Virtual reality*** *for immersive storytelling and product traceability.*
- ***Data-driven decisions****: IoT sensors to provide real-time product information.*



- *Personalize* ***customer experience****.*
- *Wildlife monitoring with* ***AI and sensors****.*
- ***Promotion of attractions*** *with recycled bio-materials and a digital experience app.*

- ***Biodiversity monitoring tools****.*
- ***Efficient drying methods*** *using solar energy and IoT.*
- *Smart sensors for* ***soil and forest monitoring****.*

- ***Clean technologies*** *such as gravimetric tables.*
- *Multispectral and thermal sensors on drones or satellites for precise explorations with* ***fewer excavations and lower costs****.*

For more information, reach out to:

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