



Economic recovery potential of Nature-based Solutions Findings from Peru

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The Nature based Solution Conference 2022
*Session 7: The Economics of NbS: moving from evidence to decision
making in policy, finance and infrastructure investments*
July 7, 2022

The project

"Positioning the Evidence for the Potential of Nature-based solutions for Economic Recovery"

- Project conducted by the Nature-based solutions Initiative Peru (NbSI Peru) at Instituto de Montaña in alliance with the NbSI of Oxford University and NbSI Bangladesh, with the financial support of the Oxford Martin School Rapid Response Grant

- Period: 2021 –2022

The project

Gaps and challenges

- The inclusion of NbS in economic recovery packages and the implementation of specific policies is limited
- Lack of understanding on how different types of NbS contribute to short term economic recovery potential (ERP) versus long term development gains and by what pathways the benefits materialize and to whom.

Goal

- To understand the short and long term economic recovery potential of investments in nature and use this knowledge as a basis for policy design.

The project

Objectives

1. To synthesize the evidence on short-term ERP (e.g, job creation, income, productivity) as well as long-term development outcomes (e.g, climate change adaptation, food and water security) of NbS in Peru.
2. To translate and share this information with decision makers from local to national and international levels.

Methodology

- Case Studies: 9 Nature-based Solutions
 - ✓ Scale diversity (local, sub-national, national)
 - ✓ Geographic regions diversity (coast, Andean, Amazon)

- Instruments design for data collection
- Interviews (mostly virtual)
 - ✓ NbS implementers
 - ✓ Key informants
- Feedback and validation process
- Documents review (reports, assessments, among others)

| NbS Case | Instrument 1a # interviews to implementers (# people) | Instrument 1b # interviews to implementers (# people) | Instrument 2 # interviews to key local informants (# people) | Feedback interviews | Sub-total # interviews (# people) |
|---------------|--|--|--|------------------------|---|
| 1 Miraflores | 1 (2) | 5 (4) | 2 (2) | 2(2) | 10 (6) |
| 2 Canrey | 1 (4) | 4 (4) | 8 (12) | 2(3) | 15 (16) |
| 3 Tuntanain | 1 (1) | 4 (2) | 1 (6) | 2(1) | 7 (2) |
| 4 Paraiso | 1 (1) | 2(2) | 1 (1) | 2(2) | 6 (3) |
| 5 Apayacu | 2 (5) | 2 (3) | 1 (2) | 1(2) | 6 (10) |
| 6 PNCAZ | 2 (3) | 5 (3) | N/A | 3(2) | 11 (3) |
| 7 SINANPE | 4 (4) | 2 (2) | N/A | 1(6) | 7 (9) |
| 8 Sierra Azul | 1 (1) | 3 (1) | N/A | 0 | 3 (3) |
| 9 AgroRural | 2 (2) | 1 (2) | N/A | 0 | 3 (4) |
| Total | | | | | 66 (51) |

Dimensions

I. Short-term economic recovery potential

1. Employment generation
2. Livelihoods
3. Productivity and income

II. Long-term development outcomes (RESILIENCE)

4. Water and food security
5. Climate change (adaptation, mitigation, disaster risk reduction)
6. Equity and social capital
7. Others: Trade-offs

III. Impacts of the pandemic

Cases (9 NbS)

| # | NbS | Scale | Geographic region | Main implementer | Co-implementers |
|---|-------------|--------------|-------------------|---------------------------|-----------------------------------|
| 1 | Miraflores | Local | Andes | National NGO | Local community State agency |
| 2 | Canrey | Local | Andes | National NGO | Local community |
| 3 | Tuntanain | Local | Amazon | International cooperation | State agency |
| 4 | Paraiso | Local | Coast | International cooperation | Local community |
| 5 | Apayacu | Local | Amazon | National NGO | Local community State agency |
| 6 | PNCAZ | Sub-national | Amazon | National NGO | State agency Local communities |
| 7 | SINANPE | National | Many | Government | Local communities |
| 8 | Sierra Azul | National | Many (Andes) | Government | Local communities |
| 9 | AgroRural | National | Many | Government | Local communities |

Diverse organizations behind NbS implementation in Peru





Main findings

Socio-economic goals and contributions by case

| # | Case | Scale | Short-term dimensions | | | Long-term dimensions | | | | | | | |
|---|-------------|--------------|-----------------------|-------------|-------------------------|----------------------|----------------|----------------|-------------------------|------------|---------------------------|----------------------------|--------------------------|
| | | | Employment generation | Livelihoods | Productivity and income | Food security | Water security | Climate Change | | | Equity and Social Capital | | |
| | | | | | | | | Adaptation | Disaster risk reduction | Mitigation | Local participation | Norms/values strengthening | Capacities strengthening |
| 1 | Miraflores | Local | Target | Co-benefit | Co-benefit | Co-benefit | Co-benefit | Co-benefit | Co-benefit | Co-benefit | Co-benefit | Co-benefit | Co-benefit |
| 2 | Canrey | Local | Target | Co-benefit | Co-benefit | Co-benefit | Co-benefit | Co-benefit | Co-benefit | Co-benefit | Co-benefit | Co-benefit | Co-benefit |
| 3 | Tuntanain | Local | Target | Co-benefit | Co-benefit | Co-benefit | Co-benefit | Co-benefit | Co-benefit | Co-benefit | Co-benefit | Co-benefit | Co-benefit |
| 4 | Paraiso | Local | Target | Co-benefit | Co-benefit | Co-benefit | Co-benefit | Co-benefit | Co-benefit | Co-benefit | Co-benefit | Co-benefit | Co-benefit |
| 5 | Apayacu | Local | Target | Co-benefit | Co-benefit | Co-benefit | Co-benefit | Co-benefit | Co-benefit | Co-benefit | Co-benefit | Co-benefit | Co-benefit |
| 6 | PNCAZ | Sub-national | Target | Co-benefit | Co-benefit | Co-benefit | Co-benefit | Co-benefit | Co-benefit | Co-benefit | Co-benefit | Not available | Co-benefit |
| 7 | SINANPE | National | Target | Co-benefit | Co-benefit | Co-benefit | Co-benefit | Co-benefit | Co-benefit | Co-benefit | Co-benefit | Not available | Co-benefit |
| 8 | Sierra Azul | National | Co-benefit | Co-benefit | Co-benefit | Co-benefit | Co-benefit | Co-benefit | Co-benefit | Co-benefit | Co-benefit | Not available | Co-benefit |
| 9 | AgroRural | National | Co-benefit | Co-benefit | Co-benefit | Co-benefit | Co-benefit | Co-benefit | Co-benefit | Co-benefit | Co-benefit | Not available | Co-benefit |

| | |
|---------------|--|
| Target | It was a target |
| Co-benefit | It was not an explicit goal, but it was a co-benefit |
| Not target | It was not a target |
| Not available | Data is not available |

Main limitations

a) Information access

- Data collection may take some time.
- It also depends on NbS implementer's time availability and willingness to collaborate.

b) Information gaps

- Most cases do not have a baseline and do not monitor economic indicators; lack of economic impact evaluations.
- Some cases do not have annual/periodic information; data is not always updated.

c) Information quality

Data triangulation and validation may take some time when it is feasible to conduct them.

Short-term economic recovery potential

Employment generation
Livelihoods
Productivity and income

1. Employment generation

- **National cases** showed a high potential for generating permanent and large amount of **temporary green jobs**. The latter mostly benefit rural/indigenous households.
- e.g. For period 2017-2020, a national case (Sierra Azul) generated **290,415** “jornales” (equivalent to £ 3,715,291).
- **Sub-national and local cases** offer evidence in this regard, although the scope is much smaller.
- Given the large number of local NbS in Peru, the aggregate impact of these interventions on employment could be considerable.



Photo: andina.pe



Photo: AgroNoticias

1. Employment generation

Communal work (“*faenas*”): Miraflores and Canrey

- Some interventions involved community members in work.
- These activities support maintenance and sustainability of the intervention, while strengthening values (e.g, solidarity, common welfare) and the social fabric.

Photo: IdM



Photo: Sernanp

Volunteer work: National case SINANPE

- SINANPE has a volunteer park ranger program to monitor PNAs. In 2020, only 328 volunteers participated (vs. 2019: 909).
- It also calls volunteers from local communities. In 2020, 2,366 local people participated due to increasing migration to PNAs and buffer zones (vs. 2019: 3,750).

2. Livelihoods

- **All local cases** showed significant effects in local livelihoods by strengthening diverse sustainable activities:

Agroforestry, shiringa rubber production, pisciculture and fishing, small-scale poultry farming, crop and livestock farming, eco-tourism

- **Sub-national case PNCAZ** supported **4,269 families** through Quality Life Plans and **2,109 families** through 14 conservation agreements.

- ✓ PNCAZ also supports zero deforestation activities:

Agroforestry, eco-tourism (buffer zone)

- ✓ **559 families** benefit from sustainable fishing and hunting for self-consumption (buffer zone).



2. Livelihoods

- **National case Sinanpe** has supported **6,334** families through contracts and agreements for the sustainable use of natural resources and natural landscape in PNAs (2021).
- **National case Sierra Azul** supported **37,801** rural families through WS&H projects (period 2017-2021).
- **National case Agro Rural** benefitted **247,855** rural families involved in agriculture through its six intervention lines (2020).



3. Productivity

Most local cases showed increasing **yields**, **prices** and **income** as a result of local livelihoods strengthening

- ✓ Miraflores: ↑ Milk yields (before: 2-3 l/cow, now: 7-8 l/cow)
 ↑ Cheese yields

- ✓ Canrey: ↑ Potato yields (before: 1-2 ton/ha, now: 2-4 ton/ha)
 ↑ Milk yields (before: 2-3 l/cow, now: 8-10 l/cow)
 2 agricultural seasons per year (before only 1)

- ✓ Tuntanain: ↑ Family income (agroforestry, shiringa rubber, pisciculture and small-scale poultry)

- ✓ Paraiso: ↑ Number of visits (before: 800, now: 4,500), ↑ Entrance fee (eco-tourism)

- ✓ Apayacu: ↑ Fishing yields (short and medium migration species)
 ↑ Family income (fishing)
 Access to regional markets (e.g, Iquitos), ↑ fish prices



3. Productivity

- **Sub-national case PNCAZ:**

 - ↑ Cocoa yield (before: 47,000 kg/year, now: 118,000 kg/year)

- **National case Sierra Azul:** (early impact assessment)

 - ↑ average production per farmer (wheat, corn, barley, cultivated pastures)

 - ↑ crop yields: maize (↑1.2 ton/ha), barley (↑ 0.72 ton/ha)

 - ↑ average physical stock per farmer of camelids

 - ↑ milk production (in 180 liters/cow per year)

 - No significant effects on farm income

- No data available for the national cases: SINANPE and Agro Rural



Long-term development outcomes

Water and Food Security
Climate change and DRR
Equity and Social Capital

4. Water and Food security



- Cases in which water security was an objective (Miraflores, Canrey, SINANPE, Sierra Azul, Agro Rural) improved water access (quantity and/or quality) for human consumption and agricultural/livestock use .
- Water/food security objectives are, in turn, linked to livelihoods and productivity improvement objectives.

- ✓ **Local cases: Miraflores and Canrey**

Improvements in water access increased pastures availability, favoring agriculture and livestock, thus contributing to increase food availability (i.e., crops, milk, cheese, meat)

- ✓ **Local cases: Tuntanain and Apayacu**

Local capacities strengthening in the sustainable management of resources (fishing, pisciculture, poultry) improved livelihoods and access to protein sources.

- ✓ **National case: Sierra Azul**

More than 37,000 families benefitted by WS&H projects during period 2021-2021.

5. Climate Change Adaptation

- Adaptation to climate change was a goal for almost all cases
- Most cases focused on reducing vulnerability by:
 - a) Increasing **water and food security**
(e.g, Miraflores, Canrey, Paraiso, Sierra Azul, Agro Rural)
 - b) Increasing **productivity and income**
(e.g, Tuntanain, Apayacu, PNCAZ)
 - c) Reducing **sensitivity of ecosystems**
(e.g, SINANPE, PNCAZ, Miraflores, Paraiso)



5. Climate Change Adaptation

d) **Strengthening of local organization** for adaptation
(e.g, Miraflores, Canrey, Tuntanain, Paraiso, Apayacu, SINANPE)

e) **Strengthening local knowledge** about **climate variability and climate change**

(e.g, Miraflores, Canrey, Paraiso, Tuntanain).

e) **Recovering indigenous/ancestral technologies and developing hybrid technologies** (Miraflores, Canrey): low cost, local materials, local identities.



5. Climate Change Mitigation and DRR

- **Mitigation** was a goal for 3 cases (Paraíso, PNCAZ y SINANPE). PNCAZ and SINANPE contributed to reducing emissions from certified deforestation and forest degradation through REDD+ projects in NPAs.

Three out of ten REDD+ projects in Peru are located in NPAs: The verified emissions reductions from them are more than 36.6 million tons of CO₂ equivalent (tCO₂e). Since 2008, they avoided the deforestation of more than 95,000 hectares.

- **DRR:** NbS contribute to increasing the health and condition of ecosystems and, therefore, to reducing risks associated with deteriorated ecosystems (e.g., landslides, rockslides, fires).

SINANPE has a forest fire risk management strategy: 120 forest fires were controlled by park ranger firefighters in 2020.

AgroRural has a Disaster Risk Management intervention line: In 2020, 86,000 producers received support for preventive actions and response to natural disasters.



Photo: Sernanp



Photo: IdM

6. Equity and Social Capital

- Findings on local cases highlights the importance of **local participation** throughout the various stages of the NbS intervention, as well as **knowledge transfer** and **local capacities and organization strengthening**.
- All NbS local implementers worked to strengthen leadership and local ownership of the intervention: these are key elements for the sustainability (continuity) of the intervention.
- Another key finding for all local cases is the development of financial sustainability through strategies to attract public and private funds from national and international sources.





Pandemic impacts

Pandemic impacts on population and NbS

Impacts were identified at **two levels**:

1) **At the population level:**

- Health impacts (due to Covid-19)
- Livelihoods negatively affected in various sectors: agriculture, tourism, among others
- Migration from cities to rural areas, resulting in social conflicts
- Unemployment; decreasing opportunities for temporary employment

Pandemic impacts on population and NbS

2) At the intervention level:

- In the beginning, there was a temporary stoppage of activities due to social isolation measures.
- This made difficult to maintain green-gray infrastructure of some NbS (Miraflores, Canrey).
- **National cases:**
 - Temporary stoppage reduced capacity to generate temporary employment (i.e, Sierra Azul, Agro Rural).
 - In contrast, permanent employment remained; this is relevant due to the volume of people hired (SINANPE, Agro Rural).
 - Slight increase in deforestation rates due to limitations in patrolling and monitoring (PNCAZ and SINANPE).

Pandemic impacts: NbS cushioning effects

- Cases that strengthened both social fabric and livelihoods showed evidence to cushion pandemic impact: food security for residents and migrants, social organization, decision making processes.
- National case SINANPE helped not only in keeping a large number of green jobs (i.e, park rangers), but also providing support through aid programs that reached vulnerable indigenous communities.
- Other national cases (i.e, Sierra Azul, Agro Rural) kept generating temporary green jobs despite of the pandemic.
- Although tourism in PNAs was highly affected, the domestic demand for nature and ecotourism is now growing. This will generate opportunities for increasing local income.

Conclusions and key messages

Nature sustains our economies and societies

- Ecosystem services worldwide are estimated **\$125 billion** annually, supporting sectors such as agriculture, fishing, forestry, and tourism that employ **1.2 billion people** (IUCN 2021).
- A recent report (IUCN 2021) estimates that **more than half of global GDP** is moderately or heavily dependent on nature and its services.
- In Peru, the biological diversity in PNAs generates each year **more than USD 1,000 million to the national economy**, through non-timber forest products, water supply and scenic beauty, among others (MINAM, 2010)

Conclusions

At local scale

- Positive impacts of NbS on rural livelihoods
- Similarly, on water and food security and climate change adaptation
- Most cases have also attracted national and international funds to continue NbS activities.

At national scale

- Large amount of temporary green jobs
- Support to vulnerable communities located in remote areas
- Provision of critical ecosystem services for the country

In general

- NbS contributed cushioning pandemic impacts as well as to building a resilient recovery.
- They also prepare communities to face other crisis and challenges ahead: climate change, water and food security, among others.



Key messages

- Post-pandemic recovery plans that invest in nature and green jobs, sustainable finance, efficient management of natural resources, and sustainable production and consumption will accelerate the transition to a healthy and resilient future.



Key for sustainability and upscaling:

- Participation and local ownership
- Strengthening of local capacities and social organizations
- Knowledge dialogue and adapt indigenous technologies





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