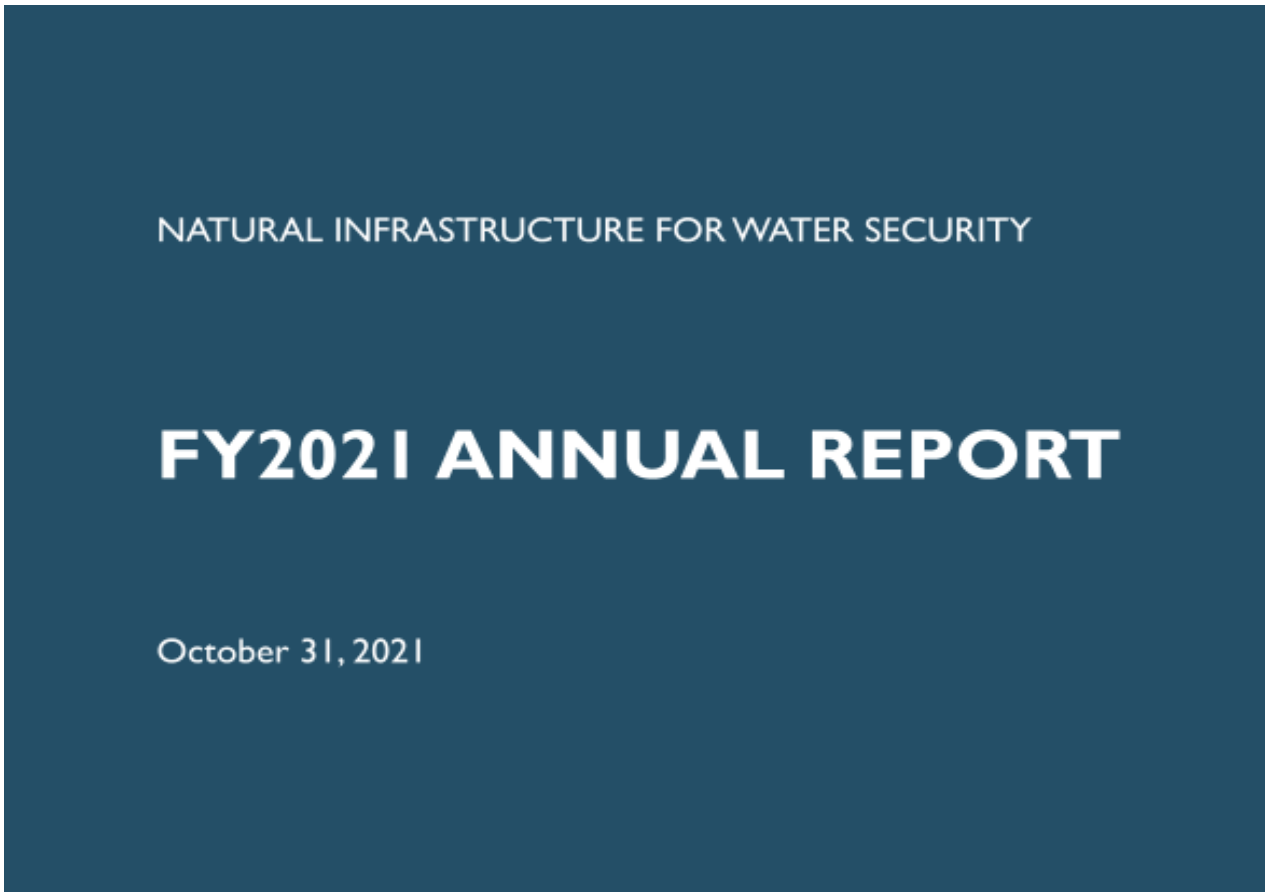


COOPERATIVE AGREEMENT # 72052718CA00002

LIMA, PERU

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This document was prepared by Forest Trends, implementing partner of the Natural Infrastructure for Water Security Project (NIWS), with contributions from our partners, including CONDESAN, the Peruvian Society of Environmental Law (SPDA), EcoDecision, and researchers from Imperial College London. For clarification or follow-up to this report, please contact Fernando Momiy, Chief of Party, at fmomiy@forest-trends.org.

# EXECUTIVE SUMMARY

As the Natural Infrastructure for Water Security project (NIWS) closes our fourth fiscal year, we are inspired to see the signs of lasting, systemic change in favor of water security. Our portfolio of investments in development grew exponentially this year—led by the unprecedented commitment of the Peruvian government through Reconstrucción Con Cambios—and this year alone we secured the initial approvals for over $195 million (M) in new investments in natural water infrastructure. To date, we have mobilized $3.5 M in public and private investments in natural infrastructure for water security, and in March we celebrated the inauguration of the first ecosystem services project ever approved and implemented by Lima's water utility, SEDAPAL. We have contributed to building a common vision for natural infrastructure in Peru, and we have secured approvals of 9 new policies and regulations to date that are bringing the country closer to that vision, including path-breaking improvements to wetland protection and management and the first Gender Policy approved in the water sector. More than 717 professionals in 413 organizations report using the knowledge products, tools, and guides we have developed – and this year, we have developed and refined these tools to make them even more useful to practitioners and decision-makers. We saw outstanding gains in capacity-building through partnerships with public sector and academic partners, resulting in NIWS having strengthened capacities of over 4000 people to date. Over 70 women leaders have strengthened their skills to lead in water management, and a new class of local women leaders began their training in the second round of our innovative Women's Leadership Program in July.

These advances have taken place in an especially volatile and challenging year characterized by extraordinary political instability and the continuing COVID-19 pandemic. This year alone, Peru has had four Presidents, a highly polarized national election, and several changes of cabinet impacting NIWS counterparts. Peru also suffered a devastating second wave of the COVID-19 pandemic in Q2, resulting in current estimates that Peru has experienced the worst per-capita mortality rate due to COVID-19 in the world.[1] This crisis has also impacted our staff, partners, and counterparts, although thankfully our strict COVID-19 protocols have contributed to preventing transmission during NIWS activities and have supported our staff impacted by the virus to recovery. NIWS cautiously resumed field visits and limited meetings at the beginning of this fiscal year and has continued to work with technical counterparts in the national government through the most recent transition, thereby allowing us to continue to advance NIWS objectives even in this challenging context.

**Objective 1: Enabling Environment for Natural Infrastructure Improved**

This year, Peru celebrated the 200th anniversary of its independence and began to articulate, in writing, a common vision for natural infrastructure for water security. In March 2021, the Organization for Economic Cooperation and Development (OECD) published its final report on Water Governance in Peru, culminating a two-year process of the Policy Dialogues on Water Governance process led by the Ministry of Environment (MINAM). NIWS provided technical and logistical support throughout this process, as well as our own technical contributions directly to the OECD, which led to the incorporation of several recommendations that highlight the strategic role of natural infrastructure for water governance and push for significant innovations in water governance and public investment water

[1] Ariel Karlinsky, Dmitry Kobak. Tracking excess mortality across countries during the COVID-19 pandemic with the World Mortality Dataset. eLife, 2021; 10 DOI: 10.7554/eLife.69336

risk management with natural infrastructure. NIWS then continued to support MINAM to prepare a report to be proposed for adoption by Peru's Multisectoral Committee, which would internalize the prioritized OECD recommendations as Peru's own roadmap for improving its water governance. This process was interrupted by the governmental transition, but we expect it to be finalized in FY2022.

NIWS also collaborated with MINAM to build a shared vision to support accelerated and synergistic action to implement nature-based water solutions prioritized in Peru's National Adaptation Plan. This effort began with an analysis of the adaptation measures in Q1-2, followed by a workshop attended by 44 participants from institutions such as ANA, MINAM, MIDAGRI and SERFOR in June, which served to identify shared priorities across sector for scaling nature-based water solutions for climate adaptation.

NIWS also provided comprehensive support for Peruvian policymakers to achieve transformational policy changes that are bringing that vision into reality – including this year's approval by MINAM of a new Supreme Decree to protect wetlands through decentralized, multilevel governance. The regulation was developed, from its inception, with the technical and legal assistance of NIWS, led by SPDA and in close coordination with the multisectoral National Wetlands Committee. It introduces specific prohibitions and sanctions for the most critical threats affecting wetlands, including peat extraction for commercial purposes that NIWS previously documented. It also clarifies the roles and responsibilities of various sectors and agencies (including MINAM, PRODUCE, SERFOR, INAIGEM, SERNANP, ANA, OEFA, OSINFOR, regional and local governments) in wetland management and conservation.

NIWS also supported the Ministry of Housing, Sanitation and Construction (MVCS) to include source water conservation in Peru's National Sanitation Plan. CONDESAN led these efforts by updating the HIRO tool in scope and methodology to meet the needs of this policy-making process. The updated tool and preliminary results were shared and validated with water utilities, watershed councils, and other experts in six NIWS priority watersheds. The tool was then run for 47 water utilities throughout Peru, identifying 5.5 million high-priority hectares for the restoration and conservation of natural infrastructure within 133 watersheds. The proposed policy has been finalized and is awaiting approval by MVCS.

Our communications efforts continued to strengthen political and public awareness of the importance of natural infrastructure and gender equality to water security, strategically supporting priority NIWS objectives. This year, we built on digital strategies strengthened as part of our COVID-19 response, to reach more than 89,000 views through our webinar series, 6.3 million views through the NIWS consortium members' social networks, and a potential audience of 57 million people through written, television, online and radio press. Content was developed with ANA, MIMP, SEDAPAL, Reconstrucción Con Cambios, MINAM, SUNASS, and other key counterparts, including through an innovative new virtual photographic exhibition on Women in Water coinciding with World Water Day and a photo contest on natural infrastructure for disaster risk management launched in Q4. We also collaborated with regional governments, watershed councils, and other local partners, to highlight opportunities for moving finalized projects to implementation with local authorities and the general public in each locality.

We also invested in broader capacities to communicate on natural infrastructure through training 100 journalists and communications professionals. SPDA led two editions of our successful journalist training program, each enriched by world-renowned journalists working across diverse media platforms. NIWS awarded a total of 10 proposals through our Journalist Fund, which have produced award-winning articles on topics such as inequalities in access to water, the role of women in water management, the

importance of wetlands, and MERESE for Lima's water supply. Additionally, we convened the first national workshop of water communications professionals, Voices for Water, in June 2021, bringing together 146 communicators from across Peru. Two communications campaigns proposed during the Voices for Water First National Meeting of communicators for water management were selected for support from NIWS, one of which has already received an award from MINAM.

### Objective 2: Information Management Improved for Decision-Making on Natural Infrastructure

This year, NIWS continued to publish knowledge products on natural infrastructure that clarify for decision-makers the benefits and limits of natural infrastructure for water. With contributions from EcoDecision and Imperial College of London, CONDESAN led the development of two meta-analyses and policy briefs covering: 1) the impacts of *andenes* (platform terraces) and terraces on water and soils, and 2) natural infrastructure for the management of erosion and flood risks in the Andes. The publication launches were among the most popular events hosted by NIWS throughout the year and were coordinated with key national authorities, like ARCC and CENEPRED.

NIWS also added credibility to the evidence for natural infrastructure solutions and approaches to inform decision-making by publishing two articles prepared by our team in prestigious academic journals. In August, the journal *Integrated Environmental Assessment and Management* published an article entitled, *Producing valuable information from hydrologic models of nature-based solutions for water*. In September, the *Science of the Total Environment* journal published an article led by the NIWS team entitled, *Progress in understanding the hydrology of high-elevation Andean grasslands under changing land use.* NIWS is also preparing a new policy brief to share the findings of the latter article.

These knowledge products not only highlight what we know about natural infrastructure impacts but also identify critical gaps in our current knowledge which become priorities for new research. This year, CONDESAN led efforts to consolidate regional research agendas on natural infrastructure for water security, in collaboration with watershed councils in the Chillon-Rimac-Lurin, Quilca-Chili and Chira-Piura watersheds, as well as to lay the groundwork with the ANA's Academic Water Roundtable to coordinate efforts toward a National Research Agenda. Moreover, NIWS consolidated its partnership with ANA to connect these research agendas to a cycle of knowledge creation that will be spurred through a scholarship program. In August, ANA and NIWS launched the scholarship program as part of ANA's 2021 National Water Culture Program; selected proposals will receive financial support from NIWS in FY2022.

NIWS continued efforts this year to advance hydrological monitoring of natural infrastructure interventions, a critical step to fill many of the knowledge gaps we have identified. This year, CONDESAN led the establishment of two new hydrological monitoring sites which will generate data to support the evaluation of the impact of natural infrastructure, in the Lurín and Cañete watersheds – work that was able to take place as the project resumed field activities after the 2020 hiatus due to the pandemic. NIWS also continued to support and strengthen the influential Initiative for Hydrological Monitoring of the Andes (iMHEA) through facilitating the network's virtual annual assembly, coordinating the preparation of a 2021-2030 roadmap for the network, leading the development of three new ecohydrological monitoring protocols, and developing a new data management platform for iMHEA's hydrometeorological data. NIWS also invested in the design of a monitoring & evaluation system for

SEDAPAL's MERESE portfolio, which has been finalized and delivered to the utility for implementation.

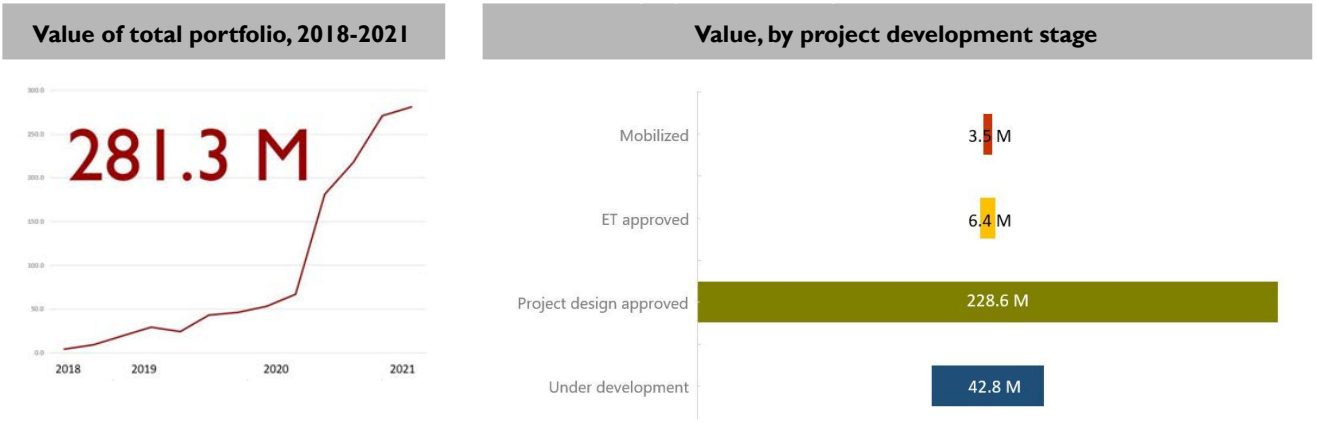
In addition to clarifying and enriching the knowledge base to support effective investments in natural infrastructure, this year NIWS made significant improvements to practical tools that allow project developers and other decision-makers to apply that knowledge. Led by CONDESAN, our flagship tool for the rapid identification of opportunities for natural infrastructure investments, HIRO, was further developed to support our collaboration with MVCS (as described above), as well as to respond to needs identified by MINAM in a new version called HIRO-Ambiente. Additionally, this year CONDESAN began designing the online platform for HIRO, which will allow users to directly access the tool online in its various applications.

NIWS also significantly advanced our CUBHIC methodologies for *ex ante* quantification of water and soil benefits of natural infrastructure interventions, under the leadership of CONDESAN and Imperial College London. The new version, called CUBHIC 2.0, improves on the previous version by further developing equations, improving the ability to evaluate multiple scenarios, incorporating model calibration, and allowing for the estimation of hydrological benefits at the micro-watershed level. The model also incorporates recent developments from the NIWS project, such as the new evapotranspiration dataset (PISCO ET0) developed this year with SENAMHI. CUBHIC 2.0 will be finalized and published in FY2022.

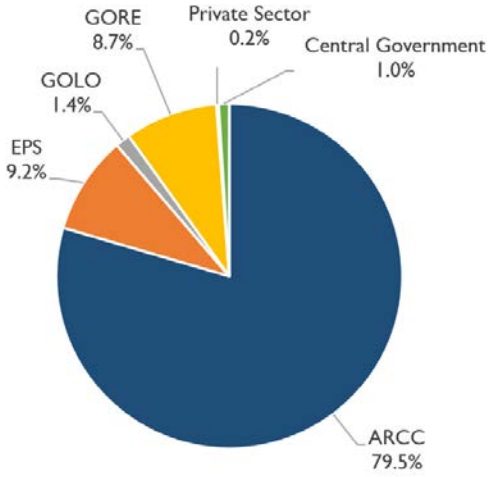
### Objective 3: Natural infrastructure Projects are Designed, Financed, and Implemented in Vulnerable Watersheds

Our portfolio grew exponentially this year, to a total of over $275 million in 52 projects developed with 147 communities in 20 vulnerable Peruvian watersheds. COVID-19 restrictions have inhibited some progress in the mobilization of investments this year, with $2.5 M reaching this target during the fiscal year. Nevertheless, 32 of the 57 projects receiving direct NIWS support achieved new milestones, including $195 million in investments receiving project design approvals ("declared viable"). With these advances and improvements to investment mobilization processes, we are on-track to reach our overall project targets for investment mobilization. See Figure ES-1 for a summary of our complete portfolio.

**Figure ES-1. Current status of investments in development with NIWS support (all values in USD)**



**Share of portfolio by value, source of funding**




**Value by region**


The exponential growth in our overall portfolio value and project design approvals was led by **Reconstrucción Con Cambios**, the temporary Peruvian authority charged with enhancing the resilience of vulnerable coastal watersheds to water and climate extremes. During FY2021, 10 natural infrastructure projects under RCC have received project design approvals (i.e., "viability") as part of the RCC's Integrated Plans to Control Flood and Landslide Risks in vulnerable watersheds. Altogether, these viable projects are valued at more than USD 186 M, with USD 170 M attributable to NIWS technical assistance, training, and strategic accompaniment. This portfolio of projects is unprecedented in the country and the broader region in terms of the magnitude of investment in nature-based water solutions. Together, the portfolio of viable RCC projects is expected to restore over 45,000 hectares of Andean forests and grasslands, create over 3 million day labor jobs, and sequester at least 5 million tons of carbon dioxide while mitigating flood and landslide risks once mobilized.

While NIWS, led by Forest Trends, continues to support development and approvals for remaining RCC investments in the project design stage, we also began this year to accompany approved projects to the next stage. In close coordination with the RCC Authority and the UK Delivery Team, contracted through Peru's Government-to-Government agreement with the United Kingdom to manage the execution of RCC investments, NIWS has been leading the development of a set of methodologies to guide the next and final stage of project development. Methodologies under development include guidance for engaging and training local populations with a gender approach and guidance on defining site-specific interventions and species selection. NIWS is also developing a plan for RCC to meet the demand for plant species for projected reforestation efforts, which NIWS analysis has shown will eclipse current supply in RCC watersheds. These efforts are continuing at full speed in FY2022.

This year's investment mobilization was led by **regional governments**. Most notably, we mobilized a $2.1 M investment in Pusmalca by the regional government of Piura, which will restore over 700 hectares of cloud forests, protect a series of headwater springs, implement an early-alert system for landslides and forest fires as well as a system of surveillance and control to protect the critical area for Piura's water security – all while creating approximately 5000 day labor jobs. Led by CONDESAN,

NIWS also secured final project approvals from the regional government of Lima for the Chancay-Huaral project ($5.3 M) as well as from the regional government of Piura for the El Faique project ($1.2 M). In earlier stages of project development, this year the Macara-Quiroz project ($3.2 M) was declared viable by the regional government of Piura. Several other project designs were advanced in technical development this year.

Additionally, CONDESAN led the development of two pilot application of the IOARR investment modality for natural infrastructure, which was made possible by guidelines approved by MINAM with NIWS support in 2019. The pilots, in Lima and Cusco, will be the first applications of IOARR in natural infrastructure and have already progressed through to completing the ETs in just one year, demonstrating the time savings that this modality offers to acting on needs for natural infrastructure maintenance and restoration.

NIWS investments mobilized in FY2021 also include **private sector** investments advanced through our revamped blended finance strategy implemented this year. In Moquegua, the Tumilaca pilot project ($180,000), financed by Anglo American Quellaveco and redesigned in FY2020 with NIWS support, will restore 20 hectares of forest with native species. Additionally, Forest Trends secured $300,000 in a grant from the Mitsubishi Foundation of the Americas to invest in pilot activities and capacity-building for natural infrastructure in the Moquegua region. The new project, *Building the Blueprint and Capacity for a Scaled, Community-Based Restoration Economy in Moquegua*, will run for 3 years (January 2021 – December 2023), and will be implemented with NIWS' partners in Moquegua. Together, both pilot activities demonstrate our blended finance strategy, as more agile (and smaller) private investments lead slower, and much larger, public investments – generating information, capacities, and momentum to support the larger portfolio along the way. To coordinate the pilot activities with the larger portfolio, NIWS has helped to activate the emerging Collaborative Regional Development Platform in Moquegua, led by the Regional Government of Moquegua, Anglo American Quellaveco, the Mitsubishi Corporation, and the International Finance Corporation.

In March, we celebrated the inauguration of the Carampoma wetland restoration project ($0.9 M) in the headwaters of Lima's Rimac river, marking the historic milestone of the first NIWS-supported project and the first project in **SEDAPAL**'s MERESE portfolio to reach implementation. NIWS technical assistance also resulted in the project design approvals ("viability") of 7 new public investment projects in SEDAPAL's portfolio, together totaling USD 5.4 M. These projects were initiated by NIWS through a set of local NGOs in FY2020, and they are the first full tranche of projects to follow in the footsteps of the Carampoma project. The process of project development and review has created a rich set of lessons and has allowed SEDAPAL and Forest Trends to chart out a clear path for future investment projects developed by the water utility, which NIWS has consolidated into a manual that is currently with SEDAPAL for final review and approval. Additionally, Forest Trends and SEDAPAL have prepared guidance for community relations in MERESE project development, which is also in process of validation and final review.

We also marked the approval and implementation of SEDAPAL's first contract for goods and services to implement MERESE funds, which were used to build a plant nursery in the San Antonio community. While the San Antonio Project has a relatively small budget (USD 10,000), it is important because it is the first project to use this implementation modality, which is far more agile than public investment projects, which has so far been the prevailing MERESE implementation mechanism used by water utilities

across the country. NIWS has also led analysis to evaluate the feasibility of implementing performance-based contracts in the Sedapal MERESE context as well as to transfer MERESE funds to a third party (candidates include PROFONANPE, the regional government of Lima, and AgroRural) in the interest of accelerating implementation. NIWS collaborated with USAID's Public Financial Management for Payments for Environmental Services project in the latter effort and, as a result of this set of analysis, has identified a set of barriers and opportunities that will guide solution development in FY2022.

This year, NIWS formally launched our online Project Design Toolbox, which features the suite of tools that our team has developed to respond to specific needs identified in each stage of project development. So far, NIWS has developed 10 tools available on the toolbox, and more than 16 additional tools are currently being developed and piloted. A notable new tool added to the toolbox this year is NIWS' *Guide for the Evaluation of Interventions in Natural Infrastructure for Water Security: Effectiveness, Equity and Sustainability Scale*, published in December 2020. The Guide was developed by the NIWS Consortium to support project formulators and evaluators in all stages of project development and management in these three priority dimensions, and in a spirit of continual improvement and adaptive management. A number of additional tools are in final stages of review; in addition to those tools and methodologies discussed in Objective 2 above, these include a Catalogue of Technical Specifications for Natural Infrastructure Measures, guides for evaluating the state of relict forest and paramo ecosystems (developed with MINAM), the Methodological Guide for the Identification, Categorization and Prioritization of Degraded Areas (also developed with MINAM), the Guide to Hydrological Modeling for the Evaluation of Natural Infrastructure, and guidance for selecting appropriate species for natural infrastructure measures.

Finally, this year NIWS also implemented new efforts to strengthen value chains associated with natural water infrastructure in the Mayo watershed (San Martin region), resulting in a capacity-building and marketing plan for local beekeeping associations. NIWS also scoped efforts that will begin in FY2022 to support value chains in ChiRiLu watersheds (Lima region), Arequipa, and Piura. All efforts are being coordinated to complement select investments in the NIWS portfolio.

**Cross-Cutting Themes**

This year, NIWS' capacity-building strategy strengthened the capacities of 2,846 people (42% women), more than doubling the total number of people trained in the first three years of the Project. Led by Forest Trends, our capacity-building strategy was primarily executed through online courses this year – a pandemic adaptation that has allowed us to strengthen and deepen our offerings. We completed 2 courses through the NIWS Virtual Classroom: an introductory course on natural infrastructure and disaster risk management offered to AgroRural staff (78 graduates, 14% women) and a course for RCC project developers and supervisors on the final stages of natural infrastructure investment project design and approval (54 graduates, 37% women). Additionally, we developed and launched a massive and open online course (MOOC) for Sustainable Water Management with the National Public Administration School and SUNASS, which has already engaged over 5,000 professionals from all over the country, with 2614 people (42% women) having successfully completed the MOOC. Finally, this year Forest Trends led the development, launch and facilitation of the Community of Practice (CoP) for project developers, a virtual space for peer-to-peer exchange about natural infrastructure, accessible to graduates of NIWS courses. The CoP was launched during Q3, and there are currently 303 active users (25% women).

This year, Forest Trends updated the project's Monitoring, Evaluation, and Learning Plan in coordination with USAID; the NIWS team also carried out a suite of efforts in support of the MEL Plan. Notably, in Q3 Forest Trends carried out a Use of Information study, based on a survey of over 800 NIWS event participants (40% women). 99% of those surveyed reported at least one NIWS knowledge product was useful, and 85% reported having already used the information.

Forest Trends also led the development of publications to share main project achievements to date with our partners and stakeholders. The Journey to Water Security publication, which catalogues the main achievements of the Project to date, was finalized in Q4 and published in October 2022. A similar summary of achievements in our gender strategy will also be published in early FY2022.

**Gender Strategy**

Our efforts to mainstream gender in Peru's leading water management institutions resulted in the approval of the first Gender Equality Policy in the Peruvian water sector, led by Peru's water utility regulator, SUNASS. While Peru's National Gender Equality Policy, approved in 2019, requires all public institutions to mainstream gender, SUNASS is just the third public institution in Peru to formalize its own institutional policy on gender equality. Moreover, SUNASS' gender policy goes further than the gender declarations included in the other institutional policies by establishing the following specific institutional commitments, ranging from preventing sexual harassment to promoting staff training and equal pay. The policy also emphasizes the use of a gender approach in the design and implementation of the water utilities' MERESE programs. Similar efforts with the ANA have been delayed, partly due to impacts of the political instability that characterized much of this fiscal year.

Forest Trends also continued collaboration with MINAM this year to ensure women's voices are fully considered in climate policy development and implementation, through the consolidation of the National Committee for Women and Climate Change (CONAMUCC), which was established in FY2020 with NIWS support. This year, Forest Trends provided technical assistance to CONAMUCC to support its activities including i) appointing representatives to the National Commission on Climate Change, ii) preparing a work plan for FY2022, and iii) holding a virtual training session on climate change and gender. This support will continue in FY2022.

In addition to these collaborations with national agencies to mainstream gender in water and climate policy, NIWS continued this year to support the development of transformational women leaders who can drive change from the bottom-up. In October 2020, we celebrated the graduation of the first class of 72 women in our Leadership Program for Women in Water Management. Following the close of the first round of the program, Forest Trends captured lessons learned and designed a new round of the program specifically for women leaders at the local level. There was a large demand for this second round of the Program, with 25 women leaders selected out of 399 applicants. The program began in July and will run through February 2022. Recognizing the difficulties in access to computers and the internet, NIWS is providing mobile internet service and laptops for temporary use during the program, as well as focused tutoring and mentoring to support the leaders to make change in their organizations and communities.

Finally, NIWS continued to develop and apply innovative guidance to incorporate a gender approach in natural infrastructure investments. The gender approach is clearly included in the Effectiveness, Equity, and Sustainability guide published in December 2020; additionally, Forest Trends has developed Guidelines for Gender Mainstreaming in the Natural Infrastructure Investment Cycle, which we aim to finalize and publish in FY2022. The NIWS team has begun applying these guidelines with counterparts in our own project portfolio, and is developing an investment project with the regional government of Ayacucho, in collaboration with MIMP, that aims to serve as a reference case for full incorporation of the gender approach in public investments.

**Administration and Adaptive Management**

Forest Trends and our partners continuously refined and updated our COVID-19 policies and protocols this year, in response to changes in context and also new regulatory requirements implemented by the Government of Peru. The COVID-19 Surveillance, Prevention and Control Plan was submitted to the Ministry of Health (MINSA) in October 2020. New travel and meeting protocols were implemented throughout our Consortium and for contractors in April 2021 to ensure appropriate controls accompanying the resumption of field activities. Our COVID-19 protocols were updated throughout the year, with the 5th version most recently submitted to MINSA in October 2021. We held multiple trainings for staff and NIWS partners on these policies and protocols, and we prepared a graphic brochure on COVID-19 risks and prevention measures to share with local communities during field visits. Forest Trends also implemented programming to support staff wellbeing in the context of the pandemic, ranging from ensuring appropriate ergonomics at home to supporting mindfulness, mental health, and effective team communication.

During this Fiscal Year, Forest Trends and our partners also implemented the staffing strategy shift described in our FY2021 Work Plan, which allowed us to dedicate teams to each of our "priority clients," or main sources of funding for natural infrastructure investments we aim to mobilize – regional governments, Reconstrucción Con Cambios, SEDAPAL and other key water utilities, and the private sector directed by our "blended finance" strategy. This shift required a series of new hires, largely implemented in Q1 FY2021. The shift has been successful in allowing NIWS to make significant progress this year toward our project objectives, and as such continues to be reflected in our staffing strategy for next Fiscal Year.

# ACRONYMS

| | |
|---|---|
| AGRORURAL | Agrarian Productive Development Program ("Programa de Desarrollo Productivo Agrario Rural") |
| ANA | National Water Authority |
| APCI | Peruvian Agency for International Cooperation |
| ARCC | Authority for Reconstruction with Changes ("Autoridad para la Reconstrucción con Cambios") |
| BBC | British Broadcasting Company |
| CBLD | Capacity Building |
| CENEPRED | National Center for Estimation, Prevention and Reduction of Disaster Risk |
| ChiRiLu(Ma) | Chillon, Rimac and Lurin and (Alto Mantaro) watershed |
| CNCC | National Commission on Climate Change |
| CONAMUCC | National Committee on Gender and Climate Change |
| CONDESAN | Consortium for the Sustainable Development of the Andean Eco region |
| COP | Community of Practice |
| COVID | Corona Virus Disease |
| CRHC | Watershed Resource Councils ("Consejo de Recursos Hídricos de Cuenca") |
| CUBHIC | Cuantificación de Beneficios Hidrológicos de Intervenciones en Cuencas |
| DIS | Development Information System |
| DRM | Disaster Risk Management |
| EGASE | Environmental Management and Ecosystem Services Management department of SEDAPAL |
| EMAPA | Water and Wastewater Utility ("Empresa Municipal de Servicios de Agua Potable y Alcantarillado") |
| ENAP | National School of Public Administration |
| EPMAPS | Metropolitan Public Water and Sanitation Company of Quito |
| EPS | Water utilities |
| ET | Expediente técnico |

| | |
|---|---|
| FIDA | International Fund for Agricultural Development ("Fondo Internacional de Desarrollo Agrícola") |
| FT | Technical File ("Ficha Técnica") |
| FY | Fiscal Year |
| GIRH | Integrated water resources management |
| GIS | Geographic Information System |
| GOLO | Local government |
| GOP | Government of Peru |
| GORE | Regional government |
| GRD | Disaster Risk Management ("Gestión del Riesgo de Desastres") |
| GRRNyGMA | Regional Natural Resource and Environmental Management ("Gerencia Regional de Recursos Naturales y Gestión del Medio Ambiente") |
| GTIG | Gender Equality Working Group ("Grupo de Trabajo Igualdad de Género") |
| GTM | Mountain Technical Group |
| HIRO | NIWS Rapid-Focus GIS Tool ("Herramienta para Identificación Rápida de Oportunidades") |
| HIRO-GRD | Version of HIRO for disaster risk management |
| HIRO-SEH | Version of HIRO for hydrological ecosystem services |
| HIRO-SH | Platform that integrates geoespacial data linked to natural infrastructure |
| ICL | Imperial College London |
| ICP | Identification, Categorization, and Prioritization of Natural Infrastructure Investments Tool |
| iMHEA | Regional Andean Ecosystem Hydrological Monitoring Initiative |
| INAIGEM | Glaciers and Mountain Ecosystems Research National Institute ("Instituto Nacional de Investigación en Glaciares y Ecosistemas de Montaña") |
| IOARR | Investments in Optimization, Marginal Expansion, Rehabilitation and Repositioning |
| KINEROS | Kinematic Runoff and Erosion Model |
| MERESE | Payment for Ecosystem Services ("Mecanismos de Retribución por Servicios Ecosistémicos") |
| MIDAGRI | Ministry of Agriculture and Irrigation |

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|---|---|
| MINAM | Ministry of Environment |
| MOOC | Massive Open Online Course |
| MOU | Memorandum of Understanding |
| MRSE | See MERESE |
| MVCS | Ministry of Housing Construction and Sanitation |
| NGO | Non-governmental organization |
| NI | Natural infrastructure |
| NIWS | Natural infrastructure for Water Security Project |
| OECD | Organization for Economic Cooperation and Development |
| PBG | Good Governance Platform |
| PEN | Peruvian Nuevo Sol |
| PGRHC | Watershed Resource Management Plan ("Plan de Gestión de Recursos Hídricas en Cuencas") |
| PIP | Public Investment Project |
| PISCO | Peruvian Interpolated data of the SENAMHI's Climatological and hydrological Observations |
| PMI | Multi-Annual Investment Programming process |
| PMO | Optimized Master Plan (of water utilities) |
| PROFONANPE | Peruvian Fund for the Promotion of Natural Protected Areas ("Fondo de Promoción de las Áreas Naturales Protegidas del Perú") |
| PUCP | Pontificia Universidad Católica del Perú |
| RCC | Reconstrucción con Cambios |
| RPP | Radio Programas del Peru (radio station) |
| SDG | Sustainable Development Goals |
| SEDACUSCO | Water utility servicing Cusco ("Servicio de Agua Potable y Alcantarillado de Cusco") |
| SEDAPAL | Water utility servicing Lima ("Servicio de Agua Potable y Alcantarillado de Lima") |

| | |
|---|---|
| SENAMHI | National Hydrology and Meteorology Service ("Servicio Nacional de Meteorología e Hidrología") |
| SEO | Search Engine Optimization |
| SERFOR | National Forest and Wildlife Service |
| SERNANP | National Service of Protected Areas ("Servicio Nacional de Áreas Naturales Protegidas por el Estado") |
| SNIP | National System of Public Investment ("Sistema Nacional de Inversión Pública") |
| SPDA | Peruvian Society of Environmental Law |
| STOTEN | Science of the Total Environment journal |
| SUNASS | National Superintendence of Water and Sanitation Services |
| TOR | Terms of Reference |
| UNALM | Universidad Nacional Agraria La Molina |
| UNSAAC | Universidad Nacional de San Antonio Abad del Cusco |
| USAID | United States Agency for International Development |
| USD | United States Dollar |
| USG | United States Government |
| UTEC | University of Technology and Engineering |

# CONTENTS


NIWS field work is governed by hygiene and safety protocols that include social distancing, the use of masks, disinfection, temperature checks, and dissemination of our anti-COVID booklet, as shown in this photo taken in at a workshop at Lake Sauce, San Martin, Peru. September 2021 (Photography: Forest Trends)

# Objective 1: Enabling Environment for Natural Infrastructure Improved

## IR 1.1: Political and public awareness increased on the effectiveness of NI to secure water supply and increase resilience and the need for NI investments.

### 1.1.1 Implement NIWS branding plan and project communications

In FY2021, our communications efforts built on digital strategies strengthened as part of our COVID-19 response, to great effect. NIWS communications reached more than **6.3 million views** through the NIWS consortium members' social networks and a potential audience of **57 million people** through written, television, online and radio press. This year's communications strategy focused on the following campaigns:

- **Ecosystems: Caring for Them is Caring for Ourselves,** which began in FY2020 and highlighted the importance of natural infrastructure for water security in the context of the pandemic.
- **Women in water management,** which highlighted the important role of women in water management and announced the end of the first version of the Women's Leadership program during Q1, and the launch of the second version during Q4.
- **Wetland protection,** which surrounded the approval of the Supreme Decree for wetland protection and highlighted its pioneering nature, importance and benefits for these fragile ecosystems (Q1 to Q4).
- **Mobilization of natural infrastructure investments** in the NIWS portfolio, which included a national campaign for the implementation of Lima's water utility (SEDAPAL)'s first MERESE project, Milloc (Q2), and regional communication campaigns on the approvals of ETs in Moyobamba and Piura (Q3 and Q4).
- **Capacity building,** including dissemination of NIWS courses and resources: Massive Open Online Course (MOOC) on Sustainable Water Management (Q2), the "Voices of Water" National Convening of Water Communicators (Q3), Training program for journalists: In Search of Sustainability for Water Security (Q3), and the launch of the Community of Practice platform (Q4).
- **Nature Cares for Us,** which highlighted the importance of natural infrastructure for disaster risk management. This campaign was developed in close coordination with the Authority for Reconstrucción con Cambios (ARCC) and carried out during Q3 and Q4.
- **National Water Culture Award,** to accompany the launch of this national award and accompanying research support, in coordination with ANA (Q4).

**Webinar series**

In FY2021, NIWS held 21 webinars, which together were viewed more than 89,000 times (see detail in

Figure 1-1 and Table 1-1). The webinar series served to disseminate NIWS publications, tools, and knowledge products, to showcase leadership and advances by our counterparts, and to generate support for advancing key decisions on natural infrastructure policy and investment. Webinar attendance dropped in the second half of the year, because several of the webinars had more specific audiences (two webinars had specific technical audiences, and another three had regional focuses). Other factors for the decrease in attendance include the gradual return of in-person activities, as well as the presidential election which captured national attention.

**Figure 1-1. NIWS Webinars during FY2021**

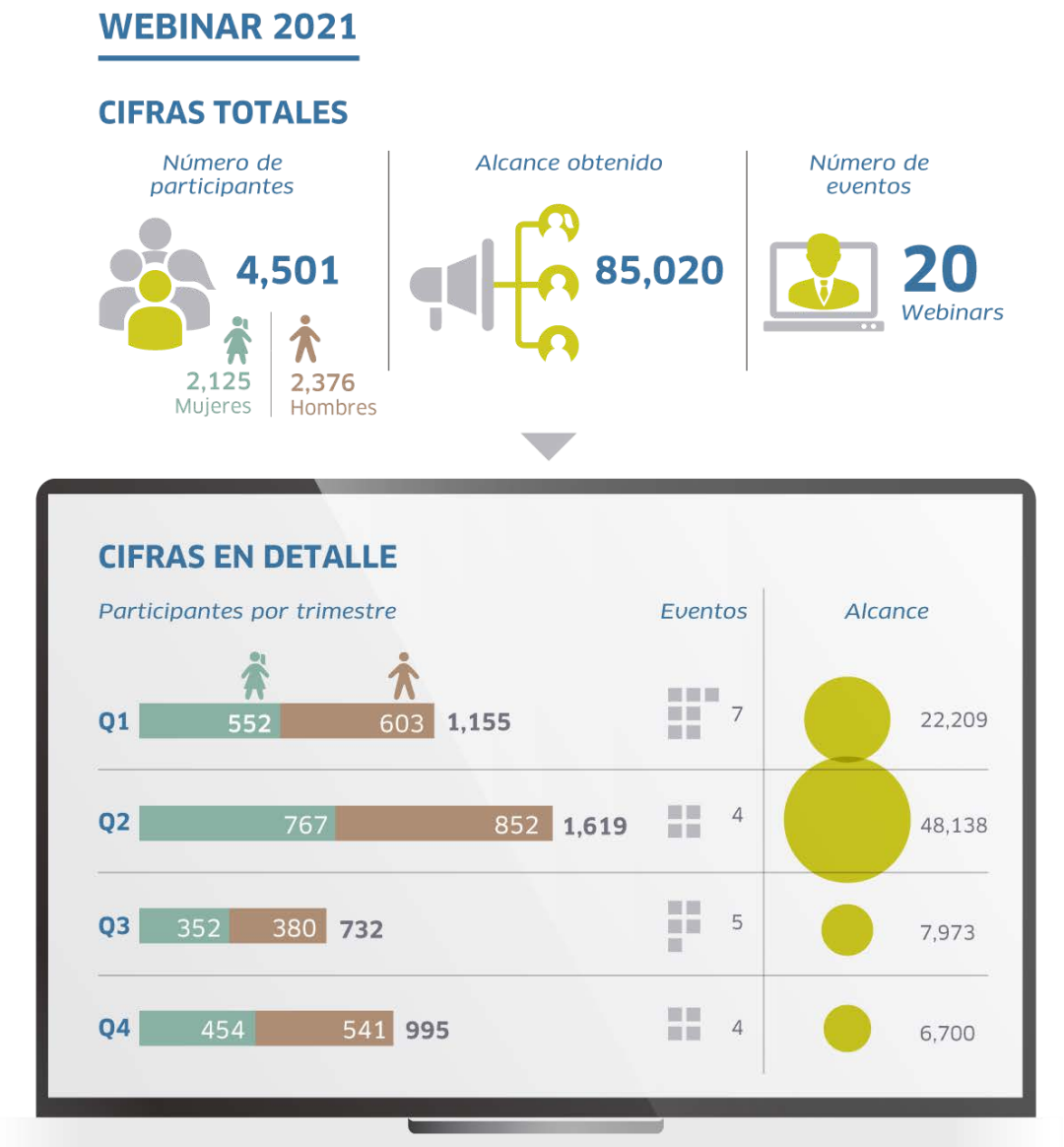


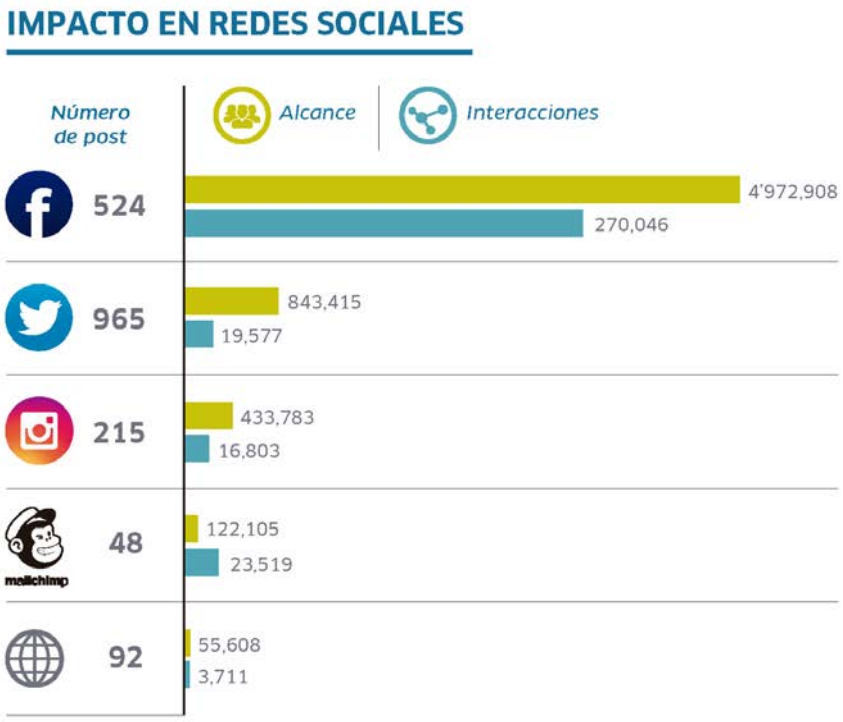
**Table 1-1. Details of NIWS Webinars during FY2021**

| N° | Theme | Date (dd/mm/yyyy) | Women | Men | Total Live Participants | Views of Recording |
|---|---|---|---|---|---|---|
| 1 | Launching of the Community of Practice in Natural Infrastructure | 19/08/2021 | 65 | 87 | 152 | 0 |
| 2 | Moyobamba: the birthplace of the Merese at the forefront in the protection of water ecosystems | 04/08/2021 | 200 | 219 | 419 | 1,600 |
| 3 | Incorporating natural infrastructure for water security in the National Sanitation Plan | 14/07/2021 | 166 | 196 | 362 | 3,600 |
| 4 | Piura: betting on natural infrastructure | 01/07/2021 | 23 | 39 | 62 | 1,500 |
| 5 | Wetlands: Source of Water and Life | 17/06/2021 | 70 | 55 | 125 | 3,900 |
| 6 | Voices for Water: First National Conference for Water Communicators | 14/06/2021 | 53 | 28 | 81 | 1,632 |
| 7 | Dialogue among Implementers: Enabling Conditions for Nature Based Solutions for Water | 15/06/2021 | 11 | 33 | 44 | 0 |
| 8 | Inauguration of the 2021 Journalist Training Program | 28/06/2021 | 25 | 28 | 53 | 741 |
| 9 | Natural Infrastructure for Integrated Disaster Risk Management | 1/06/2021 | 193 | 236 | 429 | 1,700 |
| 10 | Launch of the photographic collection "Women of water" | 22/03/2021 | 74 | 54 | 128 | 23,500 |
| 11 | Launch of the MOOC course "Sustainable water management" | 12/03/2021 | 301 | 368 | 669 | 1,938 |
| 12 | Science and engineering for water management in the Andes | 18/02/2021 | 74 | 79 | 153 | 9,300 |
| 13 | Andenes and Terraces: ancestral knowledge at the service of water and soil conservation | 19/01/2021 | 318 | 351 | 669 | 13,400 |
| 14 | Webinar. Moving towards effective, equitable and sustainable interventions in natural infrastructure | 2/12/2020 | 77 | 93 | 170 | 5,583 |
| 15 | Closing Gender Gaps in Water Management | 4/12/2020 | 78 | 37 | 115 | 2,831 |
| 16 | MOOC Sustainable Water Management at Expoagua Educational Fair | 3/12/2020 | 69 | 66 | 135 | 3,211 |
| 17 | Forest Fires: Management and Impact on Water and Ecosystems | 26/11/2020 | 170 | 224 | 394 | 3,235 |
| 18 | Seminar organized by the US Embassy in Expoagua | 5/11/2020 | 39 | 90 | 129 | 3,259 |
| 19 | Mechanisms for participation of private companies in water and sanitation projects | 29/10/2020 | 42 | 77 | 119 | 4,090 |
| 20 | Closing: First Round of the Women's Leadership Program for Water Management | 7/10/2020 | 77 | 16 | 93 | 0 |

## Social media

NIWS social media presence included over 1,800 posts reaching more than 6.3 million views through the NIWS consortium members' various platforms (see Figure 1-2). Considering data from the whole year, each post received an average of 178 interactions, which is more than the industry average for non-governmental organizations (NGOs).[2] Our average is 230 interactions when considering only Q4, which shows growth throughout the year.

**Figure 1-2. Social media and online engagement on NIWS partner platforms, FY2021**




In December 2020, Forest Trends launched an Instagram account, which in addition to serving as an institutional account has been a conduit for sharing new NIWS content created for this particular platform. The account aims to reach young audiences with information about natural infrastructure and the role of women in water management, in order to ensure that up-and-coming professionals and decision-makers are aware of these issues. The account has achieved 1,834 followers, 223 with a total reach of 525,749 people. NIWS Instagram content is also being disseminated in SPDA's existing account.

## Media outreach

In 2021, NIWS produced **25 press releases**, to disseminate project milestones and our collaborations with various partner institutions, resulting in **285 articles** in national and regional media, which have a potential audience of **57 million** (see Annex 6 for details on media coverage).

[2] 31/03/2015 Social Media Chart: Average interactions per post by industry, https://www.marketingsherpa.com/article/chart/average-interactions-by-industry

### Quarterly newsletter and online content

We published the 10th (October 2020), 11th (December 2020), 12th (March 2021) and 13th (June 2021) editions of the NIWS newsletter. The bulletins were opened more than 9,700 times in all throughout the year.

The NIWS page on the Forest Trends website was updated during Q2 with improvements to the navigation menu and two new sections: Project News and NIWS Newsletters. USAID's climate change adaptation web page also includes information about the NIWS Project, with a direct link to the Forest Trends' page.

In FY2021, more than 1,300 new photos were added to the NIWS Flickr page. The page currently has 4,137 photos and has received approximately 369,000 visits since its creation.

## 1.1.2 Develop and implement communications strategies for raising public awareness, for national policymakers, and in new sectors.

### Training program for journalists and journalist fund

Third edition

During Q1, NIWS successfully completed the third edition of the journalist training program, In Search of Sustainability for Water Security, which ran from October 7 to November 7, 2020.


The program was conducted virtually and trained 38 investigative journalists (13 men and 25 women). The participants represented 31 media outlets, including 10 digital media, 9 newspapers, 6 radio stations and 6 television stations from various regions of the country such as Arequipa, Lima, Cusco, Ancash, Piura, La Libertad, Huánuco, San Martín, Junín, Puno, Ayacucho, Moquegua, Ucayali and Apurímac.

The Program strengthened the capacities of journalists to improve the quality and quantity of articles and investigations related to water risks, through topics such as narrative journalism, digital narrative tools and podcast production. At the end of the program, 28 participants submitted 19 journalistic research proposals and received certification for the course.

The Program was conducted by renowned journalists such as Argentine writer Leila Guerriero, who has received the New Ibero-American Journalism Foundation and Manuel Vázquez Montalbán Journalism awards; Mario Munive, professor and coordinator of the Journalism program at the Pontificia Universidad Católica del Perú; and Andrés Rodríguez, journalist at Radio Programas del Perú.

NIWS selected 4 finalists out of the 19 investigative proposals submitted for funding through our NIWS journalist fund at the conclusion of our training program for journalists. In Q2, the finalists worked on

these publications with the support of the Mohme Foundation and NIWS specialists, and the articles were published through various media outlets. These publications reached a total of 2.26 million people and have raised awareness on inequalities in access to water, the role of women in water management, the importance of wetlands, and MERESE for Lima's water supply (see Table 1-2).

**Table 1-2. Summary of articles published in Q2 with support from the NIWS Journalist Fund.**

| Name | Detail | Author(s) | Outlet | Date Published (dd/mm/yyy) | Reach |
|---|---|---|---|---|---|
| Huaros: Between water management and migration to Lima | This article discusses an effort to preserve one of Lima's main sources of water. The community of Santiago de Huaro in Canta is working on an initiative to protect and preserve wetlands in the Yamecoto basin. | Jackelin Cárdenas | Convoca | 02/02/2021 | 1,578 |
| Wetlands in crisis | This article tells the story of two families facing difficulties accessing water in San Juan de Lurigancho and Carampoma as a framing for advances on SEDAPAL's MERESE program. | Nicol León Arge and Sonia Condori Sánchez | La República | 20/03/2021 | 768,194 |
| Peruvian women advocate to be recognized as the main water managers | This comic strip recognizes the role of women in the management of natural infrastructure in communities across the country. | Mirelis Morales Tovar and Valeria Aguilar | El Comercio | 22/03/2021 | 1,485,850 |
| Urban Wetlands: "A struggle to survive" | This video report exposes the degradation of coastal wetlands and the negative impact of urban development on these ecosystems that is taking place in the absence of effective policy. | Lilian Massiel Rosas Rivera, Karol Salazar Navarro, and Carmen Cobeñas Chávez | Prensa Chalaca | 26/03/2021 | 5,600 |
| | | | | **TOTAL** | **2,261,222** |

Two of the four publications were recognized by ANA's "Caring for Water is Taking Care of Yourself" journalism contest held during Water Week. The "Huaros" article won the Digital format category and the "Water Guardians" comic strip received an Honorable Mention.

Fourth edition

The fourth edition of the training program for journalists, *In Search of Sustainability for Water Security,* was held virtually with the aim of expanding the number of journalists and regional media that have the capacity to cover issues related to water resources management, natural infrastructure, and decision-making on these issues, as well as promoting journalists as relevant actors in investigation and research for water security projects.

The program ran between June 28th and July 26th, led by SPDA, and was divided into two modules:

- The journalistic module consisted of sessions on narrative journalism, podcasts and digital journalism, which were led by internationally renowned professionals such as: Sergio Ramírez, Nicaraguan writer and winner of the 2017 Cervantes Prize; Tomás Pérez, journalist and director of the Argentine magazine and podcast Anfibia; Katy Lema, journalist and Search Engine Optimization (SEO) analyst for the Spanish newspaper El País; and Roberto Herrscher, narrative journalist, reporter, and journalism professor from Argentina.

- The technical module addressed specialized topics on water security and natural infrastructure, led by NIWS specialists. The participants learned about the current state of the natural infrastructure in the country, as well as its benefits, success stories, and challenges faced by the next government.

Participants included 54 journalists and journalism students (28 men and 26 women) from different regions of the country, selected from a total of 258 applicants. 39 of the 54 participants passed the course (22 women and 17 men).

NIWS also provides a fund to support journalistic investigations, also led by SPDA, in order to improve the visibility and positioning of natural infrastructure and water security in the public sphere. At the end of the course, participants presented 10 proposals for investigative journalism—6 of which were selected for funding:

1. "Streams of Life," a 10 episode podcast with stories from communities and public institutions regarding the implementation and execution of natural infrastructure projects in Tumbes, La Libertad, Cajamarca, Ayacucho, Lima and Junín. The series will be published on *Radio Programas del Peru*'s digital platform.
2. "The Fight for Water in Peru," a comic strip to be published in the *La República* newspaper. The comic addresses access to water and ecosystem services, deepening the conservation about the environment and solutions for climate change adaptation and disaster risk management.
3. "Piura: The Importance of Reservoirs for Water Security and Flood Prevention", a podcast and multimedia special that will be broadcast on *Cutivalú* radio. This proposal addresses the difficulties faced by residents in the Piura river basin due to a lack of water management projects. The podcast will highlight the importance of natural infrastructure as part of the solution to address El Niño flood risks.
4. "Fundo Laura: Problems in the Place that Provides 60% of Arequipa's Water", an article to be published in the *Diario Correo Arequipa* newspaper. The article reports on Fundo Laura, located in the community of San Antonio de Chuca, which contains 37 springs that supply water to Arequipa, but lacks adequate maintenance and basic services for residents.
5. "A Life Fund for Arequipa" is a podcast and comic that will be published on *Kipu Visual*'s social media platforms and a news channel in Arequipa. They will cover sedimentation in the Aguada Blanca reservoir, one of the main sources of drinking water supply for the population of Arequipa, and a potential solution through the reforestation of *tolares* plants in the community of Tambo Cañahuas (Yanahuara) which can be achieved through Payment for Ecosystem Services Mechanisms (MERESE).
6. "Ancestral Water Management Practices" is a three part podcast covering stories about natural infrastructure with a focus on ancestral practices including i) the communal management of the *andenes* (platform terraces) of Tarmatambo in Junín, ii) the Los Jueces del Agua de Corongo practice in Áncash, which has been declared a natural cultural heritage and includes practices for sowing and harvesting water, and iii) wetlands management in the rural district of Chungui, Ayacucho.

The design and preparation of these proposals began in Q4, and their publication is scheduled for early FY2022. An alliance with RPP radio is being coordinated to disseminate the "Streams of Life" podcast on its platform and social media channels.

**Voices for Water: First National Water Communicators Conference**

From June 14th to 16th, NIWS held the first National Water Communicators Conference, Voices for Water, which brought together 146 water communicators with the aim of generating a shared vision around natural infrastructure for water security in a space for knowledge exchange. The event was divided into two segments: i) nine presentations open to the public, which were broadcast live on SPDA's Facebook and covered by NIWS platforms and ii) three workshops held exclusively for selected participants.


584 applications to participate in the workshops were received, from which 99 communicators were selected to participate (69 women and 30 men). Of those selected, 80 confirmed their participation (56 women and 24 men), 40 actually participated (28 women and 12 men), and 23 completed the workshop and passed (17 women and 6 men). The conference reached 9,498 live participants and 189,627 total views. In addition, 3 million people were reached through the associated communication campaign which included 35 notes published in the press.

Two communications campaigns proposed during the *Voices for Water* First National Meeting of communicators for water management were selected for support from NIWS. The two campaigns address water management and natural infrastructure initiatives that are raising awareness and promoting action by key actors, authorities, specialists, media and communities in their regions. These campaigns, each focusing on a very specific audience, are currently being implemented:

- The **"Music is a universal language: wetland awareness campaign"** by Irina Neglia began on August 11th and will end in Q1 FY2022. The objective of the campaign is to raise awareness about the importance of the wetlands in the rural community of Cordillera Blanca in Áncash, and secure commitment from GORE Áncash on a wetland protection proposal. The campaign consists of two key components:
    - Workshops with the Cordillera Negra community held on August 11th, 18th and 25th, during which Ms. Neglia and a team of specialists from the Glaciers and Mountain Ecosystems Research National Institute (INAIGEM) addressed the importance of wetland conservation and management for the community's water security.
    - Three *techno-huayno* songs about wetland management in Quechua Ancashino (the primary language of the community) written by Ms. Neglia. She performed the songs during the workshops, and played them throughout the town on speakers. Video clips of the songs are being recorded and will be shared in Q1 FY2022.

The campaign has inspired the community to request support from the regional authorities of Ancash for wetland protection. The campaign was highlighted in a national TV report by Frecuencia

Latina, an article by the Andean News Agency, and two other regional outlets.

- The **"Voices from the wetlands"** campaign led by communicators from ANA targets high school students with hopes to increase their value of wetlands as key ecosystems for the storage and regulation of water resources and get them to recognize the importance of communities and good management practices for wetland conservation. The group is recording two short videos starring local actors from the Santiago de Carampoma community in the Huarochirí district, which will address the importance of the wetlands. These videos are scheduled to be released in October.

In addition, in response to a request by the National Water Authority (ANA), in October and November 2020 NIWS held the "Organizing High Impact Webinars" workshop for 110 communicators and educators from ANA's Water Culture Unit, which are decentralized across the country. The objective of the workshop was to share NIWS' insights in the design and execution of effective webinars, capitalizing on the experience generated in recent months.

### 1.1.3 Develop and deploy communications campaigns for upstream communities

**Moyobamba Regional Communication Campaign**

NIWS implemented a regional communication campaign in Moyobamba, which began in Q3 and highlighted the approval of the Expediente Tecnico (ET) of a natural infrastructure project in the region (Project: *Recovery of water regulation ecosystem services in the Rumiyacu micro-basins, Mishquiyacu and Almendra*). The goal was to raise support from political leaders and residents for the execution of the project. As part of this regional campaign, Forest Trends, CONDESAN, and local partners organized a webinar in Q4 titled *Moyobamba - Cradle of MERESE - At the forefront of protecting water ecosystems*. 182 people tuned into the live broadcast of the event and an additional 1,600 people watched the recording afterwards. The event was attended by the General Manager of EPS Moyobamba; the coordinator of the local SUNASS office for the National Water regulator (SUNASS), Javier Noriega; the coordinator of the MERESE Management Committee in Moyobamba, Josefa Mesía; and Teresa Leyva from the beneficiary community. Overall, the regional campaign reached over 300,000 people on the consortium's social networks and over 600,000 people through 16 articles published in local and regional press.

**Figure 1-3. Publishing of Q4 from the Moyobamba regional communication campaign**


## Pusmalca (Piura) Regional Communication Campaign

In Q3, CONDESAN and local partners launched a similar campaign in Piura for the approval of the ET for a local natural infrastructure project (Project: *Recovery of water regulation ecosystem services of the right bank of the Pusmalca micro-basin*). During Q4, CONDESAN led a regional webinar called *Piura: Betting on natural infrastructure - Progress and experience in the implementation of Natural Infrastructure (NI) projects for Water Security*, which highlighted advances in the region and the leadership of the Regional Government in the implementation of natural infrastructure projects. 62 people participated in the live broadcast of the event and an additional 1,500 people watched the recording afterwards. Overall, the regional campaign reached over 385,200 people through the consortium's social networks and over 2,243,200 people through 19 articles published in local and regional press.

**Figure 1-4. Infographic on the Piura project published in Q4**


In December 2020, material produced by NIWS was included as part of the Ministry of Education's national "I learn at home" program," which was developed as an educational tool during the pandemic

and is broadcast by the National Television of Peru across all regions of the country. The infographic NIWS produced for the "The Water Route in Piura: From the páramos to your house" campaign was incorporated into educational material for high school students (Figure 5). The infographic can be seen in this link (minute 4:45). Based on this content, teachers created an associated Activity Guide which includes a list of tasks for students and a bibliographic reference to an NIWS article titled "The Ministry of Agriculture and Irrigation promotes the conservation of the páramos in Piura," the NIWS article has received more than 15,000 visits to date. As part of the suggested tasks, students and teachers have also created their own videos which include the NIWS material.

**"Community care: Let's protect ourselves from COVID-19"**

To support the resumption of fieldwork and NIWS Consortium members' COVID-19 protocols, in the first part of the year NIWS prepared a brochure entitled, "Community care: Let's protect ourselves from COVID-19." The brochure includes official public health recommendations for preventing and responding to COVID-19 spread in rural communities, demonstrates NIWS' commitment to community health, and summarizes NIWS COVID-19 protocols that will be implemented during fieldwork. The design includes independent sheets that can be used as posters to be printed and disseminated in the communities. Two versions were prepared with NIWS partners in mind, one for campesino coastal and another for traditional Andean communities, and have begun to be disseminated to local NIWS partners.

### 1.1.4 Strategically communicate benefits of natural infrastructure to priority audiences

**Water Week 2021**

NIWS co-organized a series of efforts with ANA for Water Week, a large national campaign that accompanies World Water Day, celebrated every March 22nd. One of the standout efforts in this campaign was a virtual photography exhibition, "Women of Water," which used an innovative technology to showcase pictures demonstrating the critical role that women play in the management and use of water across diverse settings in Peru. The online exhibition gives viewers the feeling of being at an in-person gallery, through a 3D reel and a 360° virtual tour, available at www.mujeresdelagua.com. NIWS and ANA organized the inauguration of the virtual gallery on March 22nd, which was streamed on ANA's Facebook page. 128 people tuned into the live broadcast, the recording was later viewed 3,600 times. Total press coverage for the exhibition reached 3.7 million people.

The other activity organized for Water Week with ANA was the "Caring for Water is Caring for Yourself" exhibition, which featured informative panels about forests, mountains and wetlands in three Lima municipalities (Lince, Miraflores and Lima Cercado). Afterwards, the municipalities of Lince and Lima Cercado asked ANA for permission to keep the panels displayed at strategic points within each district.

NIWS also participated in the International Forum "The Value of Water, Sustainable Development and National Well-being", which was the central event of the week and addressed the economic, environmental and social value of water. National and international experts highlighted the fundamental role of natural infrastructure for sustainable water management. The forum achieved more than 20,000 views during the three days of live transmission on ANA's Facebook page. NIWS participated in two of the forum's three sessions: Marta Echavarría, director of Ecodecisión, was a moderator for the economic valuation panel and NIWS Director Fernando Momiy participated in the environmental

valuation panel.

In addition to the activities co-organized with ANA, NIWS organized three additional activities for Water Week:

1. An exhibition titled "3 Artists, 1 message: Water lives in the Ecosystems" featuring original artwork by renowned Peruvian painters Fito Espinosa, Natalya Lizárraga and Rember Yahuarcani. The pieces were published in El Comercio and across social media networks on World Water Day (March 22nd). The total press coverage reached 2.4 million people.
2. A social media initiative in line with ANA's "Caring for Water" campaign was added to our current "Ecosystems: Caring for them is Caring for ourselves" campaign. The initiative called on graphic artists to develop designs featuring forests, wetlands, amunas, andenes and terraces, emphasizing the ecosystems services they provide, the risks they face, and the urgency for conserving and protecting them. The featured graphics reached a total of 523,946 people.
3. A press campaign, which included coverage of the Water Week activities and an op-ed authored by NIWS Director Fernando Momiy published in La República newspaper titled "Water: Are we committed, or are we engaged?". The coverage was coordinated with local campaigns in Piura and San Martín.

**American Geophysical Union Fall Meeting**

In the first half of December 2020, NIWS participated in the AGU (American Geophysical Union) Fall Meeting. The virtual event provided a space for the international exchange of scientific information from the Earth and Space sciences.

NIWS scientific advisors, Imperial College London, organized a session on December 15th on "Natural Infrastructure for Water Security," with Dr Kate Brauman as a co-convener. Eight oral presentations and eight poster presentations were delivered during the NIWS session, highlighting studies providing evidence on the role of natural infrastructure for water security and identifying knowledge gaps. The studies encompass in situ monitoring, innovative modeling approaches, systematic reviews, meta-analyses, and hydro-socio-economic assessments on the impacts of natural infrastructure; all of which help to identify the sustainable, profitable and scalable benefits of improving water resource management and promote investments in natural infrastructure. Gender balance was achieved in both sessions having 50% male and 50% female presenting authors. A summary of the event was published in the NIWS project blog of Forest Trends.

**Expo Agua Peru**

Expo Agua Peru is an annual event that serves as the largest gathering of experts, policymakers, planners, and companies working on a range of water-related issues in Peru. The event was held from October 2020 to March 2021, and it was inaugurated on October 1st with the participation of the main institutions that manage the country's water resources. NIWS joined the ExpoAgua organizing committee and, in that role, organized and participated in more than 10 virtual events (technical talks, conferences, exhibitions) as part of the ExpoAgua program. NIWS events in ExpoAgua were organized with government partners and will include content relating to Andean science and technology for water, advances in wetland protection and restoration, and presentation of Gender Action Plans by ANA and SUNASS.

NIWS also designed two virtual stands: one stand in the United States Pavilion, which featured messages

for mobilizing investments in natural infrastructure and promoting scientific research, and another stand in the Expo Agua Educational Fair promoted by SUNASS, which emphasized the development and capacity building actions implemented by NIWS.

### 1.1.5 Strategically communicate benefits of natural infrastructure to priority audiences

**Women in water management**

During the Q1, NIWS published two videos from the Women of Water series produced in 2020. The videos were disseminated on social media and promoted through channels that address gender equality, leadership and gender differences. The protagonists of these two videos are leaders and champions of MERESE in Moyobamba: Josefa Mesia Vásquez and Mery Terrones.

During the Q2, NIWS published an original Pictoline comicstrip "The Power of Woman" online for the International Day for the Elimination of Violence against Women. The graphic highlights the gender-based violence suffered by women and their limited participation in decision making; and in the Q3, NIWS published the pictoline comic strip: What is life like for rural women during the COVID-19 pandemic? that highlights the problems rural women face regarding water and health during the pandemic. The graphic was prepared using secondary information and interviews with four water leaders regarding the overload of tasks and other impacts on the lives of rural women caused by the pandemic. The comic strip was shared through NIWS social networks on March 30th and has reached a total of 26,318 people.

**Wetlands protection campaign**

During 2021, NIWS began implementation of a wetlands-focused campaign aimed at increasing public awareness and popular demand for a new regulatory proposal, prepared by NIWS, for decentralized, multi-sectoral wetlands management.

In Q1, NIWS interviewed the Minister of Environment, Gabriel Quijandría, about the regulatory proposal and the importance of wetlands called,"What does the proposed regulation for wetland protection include?" and produced the Press Release and infographic "Protecting wetlands: what are wetlands and what is the proposed regulation to protect them?". This infographic was also adapted to social networks. NIWS also produced the Infographic and animated video "Wetlands: Millennial ecosystems that provide water", which present a diagram of a wetland and its internal functions. This information is aimed at decision-makers, students, researchers and the general public interested in ecosystem issues.

During the Q3, NIWS continued the campaign on the adoption of the wetlands regulation that highlighted its pioneering nature, importance and benefits for fragile ecosystems. The campaign included a multimedia page called Our Wetlands, hosted on SPDA's Actualidad Ambiental website.

The associated digital campaign garnered more than 622,314 views on social media. The press campaign included 41 articles published in major media reaching 2,707,772 people, and the webinar reached 3,800 people.

**Dia del Campesino Comic Strip**

A pictoline comic strip was created and published in celebration of Rural People's Day (Dia del Campesino), which showcases the use of ancestral knowledge, like the storing and harvesting of water in the Andes, to manage water in rural communities. An animated version and an Instagram version were also created. The three versions were shared across NIWS social media platforms on June 24th and received 114,794 views.

**Figure 1-5. Water Sowing and Harvesting Pictoline for Rural People's Day**


## BBC Coverage of NIWS

On May 18th, the British Broadcasting Company (BBC)'s Future Planet section covered NIWS' work to revive ancestral practices and scale nature-based solutions to address the water crisis in an article titled *"Why Peru is reviving a pre-Incan technology for water"*, which was also shared on social media. The article was based on the journalist's field visits to sites in Lima, Cusco, and San Martin organized by NIWS in 2019. BBC published a Spanish version of the article in June, which was widely shared by other international media channels in Chile and Argentina with a potential reach of more than 300 million people.

**Figure 1-6. International coverage of NIWS research on ancestral water practices**


**Milloc Video and TV Report**

NIWS continued to execute the communication campaign started in Q2 surrounding SEDAPAL's first MERESE project, in the Milloc wetlands. This quarter, NIWS produced a video of the project's inauguration that compiles testimonies from authorities from the water sector and community members. The video was posted on NIWS social media platforms on April 28th and received more than 1,876 views.

NIWS also coordinated a televised report with TV Peru, which was broadcast on June 20th as part of their Green Alert (Alerta Verde) series. The report, which features NIWS' Director Fernando Momiy, highlights the importance of this SEDAPAL project that will provide the urgently needed recovery of the Carampoma wetlands, a fragile ecosystem endangered by illegal peat extraction and contamination. This report reached 957,000 people.

**"Natures cares for us" Campaign**

During Q3, in close coordination with ARCC, Forest Trends designed the *Nature Cares for Us* communications campaign to disseminate the benefits of the RCC Integrated Plans and NI projects for residents and position NI as a strategy for DRM. This campaign has two phases: from May to August 2021, and October 2021 to March 2022.

As part of the first phase, Forest Trends launched the *Nature cares for us* Photography Contest in Q4, in alliance with the ARCC and the National Center for Estimation, Prevention and Reduction of Disaster Risk (CENEPRED). The contest received 350 participating photos by 99 photographers from 18 departments, including 165 professional and 185 amateur submissions.

Additionally, a press release covered the declaration of viability of four natural infrastructure projects that will restore more than 17,000 hectares of ecosystems in Lima, Ancash and Lambayeque, which will be executed by ARCC. The first phase of the campaign has reached over 648,900 through social media and over 8,380,500 people through 63 press articles published resulting from 4 press releases from NIWS. Forest Trends will implement the second phase of the campaign during the next quarter, which

will include announcing the awards for the photography contest on the International Day for Disaster Risk Reduction (October 13th).

**Blog posts**

During FY201, NIWS published 6 blog posts to complement associated activities and publications:

- "A new journalism for times of crisis" This blog post summarizes the discussion presented in the webinar launching the "Guide for the Evaluation of Natural Infrastructure Interventions for Water Security: Scale of Effectiveness, Equity and Sustainability". The blog post was published on October 20th 2020,
- "A roadmap for investments in natural infrastructure" This blog post summarized the discussion from the webinar presentation of the roadmap for natural infrastructure investments. The blog post was published on October 22th 2020,
- "Natural Infrastructure projects can be transformative… and not only for water!" This blog post summarized the discussion of the webinar "Challenges of environmental journalism in the face of emergency and water security". The blog post was published on December 18th 2020,
- "Conserving wetlands to defend life: institutional advances for their protection". This blog post, which was published on February 2nd 2021 for World Wetlands Day, highlights the need to create the necessary institutional conditions for the protection of the wetlands in Peru. It has been viewed 21,995 times.
- "Andenes y Terrazas: Andean engineering for water and soils". This blog post summarizes the discussion presented in the *Andenes* webinar. The blog post was published on February 16th 2021 and has been viewed 2,028 times.
- "In high style: Natural infrastructure gains momentum in Peru, 4000 meters above sea level". This blog post, which was published on March 25th 2021, highlights the opening ceremony for the first ecosystem project financed with MERESE funds from SEDAPAL, located in the watershed that supplies water to Lima and Callao. The blog post was published on March 25th, in English and Spanish, and has been viewed 5,252 times.

# IR 1.2: High level roadmap to optimize use of natural infrastructure in Peru developed

## 1.2.1 Convene and charter Advisory Board

**Technical Platform**

In FY2021, the technical platform continued to serve as a space to exchange ideas and strengthen initiatives related to natural infrastructure for water security among government partners including MINAM, ANA, SUNASS, MVCS, MIDAGRI, and MIMP—as well as the NIWS team, USAID, and Canada. This year, Forest Trends worked with technical platform partners to increase their leadership in this space, through sharing their progress such as: i) SUNASS and ANA presenting their progress in mainstreaming the gender approach in their institutions; ii) SEDAPAL presenting lessons learned from

the execution of its first MERESE project; iii) ARCC presenting lessons learned from incorporating NI in Disaster Risk Management (DRM) and iv) the Ministry of Environment (MINAM) presenting proposals to modify the national MERESE Law for feedback (see Table 1-3 for a summary of the meetings).

**Table 1-3. Summary of NIWS Technical Platform Meetings held in FY2021**

| # | Theme | Detail | Date dd/mm/yyyy | Women | Men | Total |
|---|---|---|---|---|---|---|
| 1 | Natural infrastructure for disaster risk management | **ARCC** presented lessons learned in the formulation of natural infrastructure projects in the framework of comprehensive plans and progress in implementation. | 15/06/2021 | 15 | 14 | 29 |
| 2 | First MERESE project implemented by SEDAPAL | **SEDAPAL** presented lessons learned from the implementation process of the first project with MERESE funds in Milloc - Carampoma. | 12/04/2021 | 21 | 20 | 41 |
| 3 | Modification of MERESE regulations | **MINAM** presented the proposal for the "Modification of the Regulations to Law No. 0215, MERESE Law. In this space MINAM received contributions to the proposal from the members of the technical platform. | 08/03/2021 | 15 | 10 | 25 |
| 4 | Gender mainstreaming | **SUNASS** and **ANA** presented the progress made in their gender mainstreaming processes. Opportunities for gender mainstreaming in other institutions were collected. | 08/02/2021 | 11 | 8 | 19 |
| 5 | Prioritized natural infrastructure investment portfolio | The **Regional Government of Ayacucho** presented one of the projects they have been formulating with technical assistance from NIWS and MIMP. And the Project presented the prioritized investment portfolio for regional governments and SEDAPAL. | 20/11/2020 | 11 | 12 | 21 |
| 6 | NIWS Work Plan | **NIWS** presented the priorities for 2021 and opportunities for collaborative work were collected. | 5/10/2020 | 11 | 9 | 20 |

### 1.2.2 Prepare, launch and disseminate State of NI Report

This year, Forest Trends carried out an extensive review with MINAM of the scope, definitions, methodology, analysis and findings of our report, *State of Financing for Natural Infrastructure for Water Security in Peru.* Initial comments were received on the August 2020 draft in January 2021, and after the full review was completed, Forest Trends assessed that the report would need to be updated to include another year of data in order for it to be current when published. That data has now been included; the study is complete and will be launched next quarter.

### 1.2.3 Develop, publish and launch Common Vision on Natural infrastructure report

In March 2021, the OECD published its report on water governance in Peru, concluding the two-year process of the Water Governance and Policy Dialogues, led by OECD and MINAM.

Led by efforts of SPDA and Forest Trends, NIWS provided technical contributions, legal analysis, and logistical-strategic support from the launch of the Dialogues and through to the final revisions of the draft report. As a result of this support, MINAM's leadership in the process, and the OECD's own

analysis, the final report prominently features natural infrastructure as a critical tool for water security and includes a series of recommendations based on NIWS' experience and analysis regarding how to ensure that natural water infrastructure is effectively, equitably, and sustainably protected and maintained. Among all, the following general recommendations stand out:

- The use of payments for ecosystem services should be increased to protect headwaters
- The RCC Plans should require a percentage of nature-based actions to be implemented with gray infrastructure projects.
- The Watershed Resource Management Plans (PGRHC) should require the integration of natural infrastructure into gray infrastructure projects.
- An analysis of water risks in the watersheds should be performed to ensure that MERESE funds are used appropriately and to support decision-making for the design and implementation of natural infrastructure within prioritized watersheds.
- The evaluation and documentation of the hydrological benefits of natural infrastructure interventions should be initiated.

MINAM has requested additional support from NIWS to prepare for the implementation of the recommendations in the report, which requires coordination among stakeholders across all levels of government. Peru has formed a multisectoral commission responsible for preparing a roadmap to implement the recommendations. NIWS is supporting the commission's preparation of a final report that establishes prioritized recommendations in the OECD report. This effort has been delayed by the transition in administration, but MINAM indicates that the work to prepare the multisectoral commission's report is continuing and should be concluded in the coming months.

In parallel, NIWS and MINAM have developed a series of communicational materials on the OECD recommendations, which have been finalized and will be disseminated in coordination with the multisectoral commission's report.

# IR 1.3 GOP Planning Instruments Incorporate Natural Infrastructure

## 1.3.1. Build capacity of planners and national counterparts to incorporate Natural Infrastructure into formal planning instruments

### Develop conceptual framework for NI investments for GRD with MINAM

This year, Forest Trends collaborated with MINAM to develop a new simplified technical file (ficha técnica simplificada) for ecosystem services projects related to soil erosion control. The simplified technical file will provide a specialized format for erosion control projects, similar to the one that currently exists for projects that target hydrological regulation, and accelerate their design and implementation. During Q4, NIWS responded to MINAM's comments on the document; the final version is currently under review.

### MOOC: Sustainable Water Management

The Sustainable Water Management MOOC was designed through a collaboration between Forest Trends and SUNASS, and it was launched on the National School for Public Administration (ENAP) platform during Q2. This course was developed with the objective of creating a critical mass of authorities, public officials and civil society representatives informed about natural infrastructure and its role in sustainable water management. The MOOC format allows continuous participation from people from all over the country.

The Sustainable Water Management MOOC has far surpassed expectations. While we had expected 3,000 people to enroll this year, as of September 30th, there are 7,123 enrolled in the course (3,398 women and 3,725 men), of which 2,924 people have taken their final evaluation (41% of those enrolled) and 2,614 people passed (1,097 women and 1,517 men; 89% of those who took the test). The retention and pass rate is, in fact, better than ENAP's average, highlighting the value of this partnership.

**Laura Rivadeneyra**

Head of the Academic Training Program, ENAP

MOOC: Sustainable Water Management opening

*"In our previous MOOCs, only 20% of students managed to finish their course and take the final evaluation. It has caught our attention that with this MOOC, 42% of participants completed the course, of which 98% have taken the evaluation, and of those 89% have passed. This performs far better than our school's average."*

Due to the high demand for the course, the original dates have been extended and the course will run through the end of November. Although the course does not have a live instructor, ENAP has provided resources to maintain an academic assistant. ENAP has also implemented a continuous assessment system for certification, which allows students who complete the course to take the final certification exam immediately. There is a lower dropout rate with this continuous evaluation system. Next quarter, Forest Trends and ENAP will continue to monitor and support participation in the course.

**Figure 1-7. Participant Data from the Sustainable Water Management MOOC**


## Strengthening the Technical Secretaries of the CRHC

ANA invited NIWS to teach part of their capacity building program to strengthen the technical capacities of the Technical Secretaries of the CRHC to improve their management of water resources. NIWS specialists led the following events under Module 1 Unit 3 of the program, which focused on natural infrastructure in water resource management:

- Workshop 1: Natural Infrastructure and its relationship with ecosystem services - A conceptual and normative framework, by Forest Trends and SPDA
- Webinar: Tools available for the rapid identification of opportunities in Natural Infrastructure - HIRO, by CONDESAN
- Workshop 2: Management and gaps of investments in natural infrastructure and progress of the NIWS project, by CONDESAN and Forest Trends

The sessions were held between September 6th and 16th. 31 participants (7 women and 24 men) from the Technical Secretaries, Administrative Water Authority (AAA) and Local Water Authority (ALA) finished the unit, which included developing proposals for NI for their respective watershed resource management plans (PGRHC). 100% of the participants indicated that sessions were useful for their work. This content can be replicated in other trainings in the future, and ANA has requested the design and implementation of additional courses for this audience.

### 1.3.2 Support incorporation of natural infrastructure into priority planning instruments at national level

#### Support incorporation of performance-based natural infrastructure into the National Adaptation Plan

As part of the National Climate Change Strategy, Peru's National Adaptation Plan (released for public comments in December 2020 and formally approved in June 2021) includes a series of adaptation measures that incorporate natural infrastructure approaches to address water risks. This year, Forest Trends and SPDA identified an opportunity to accelerate implementation of these measures by treating them as a package, rather than looking at each of them in their respective sectoral silos. Beginning in Q1 Forest Trends and SPDA began coordinating with MINAM to develop an approach to support and promote the implementation of the adaptation measures under a multisectoral vision.

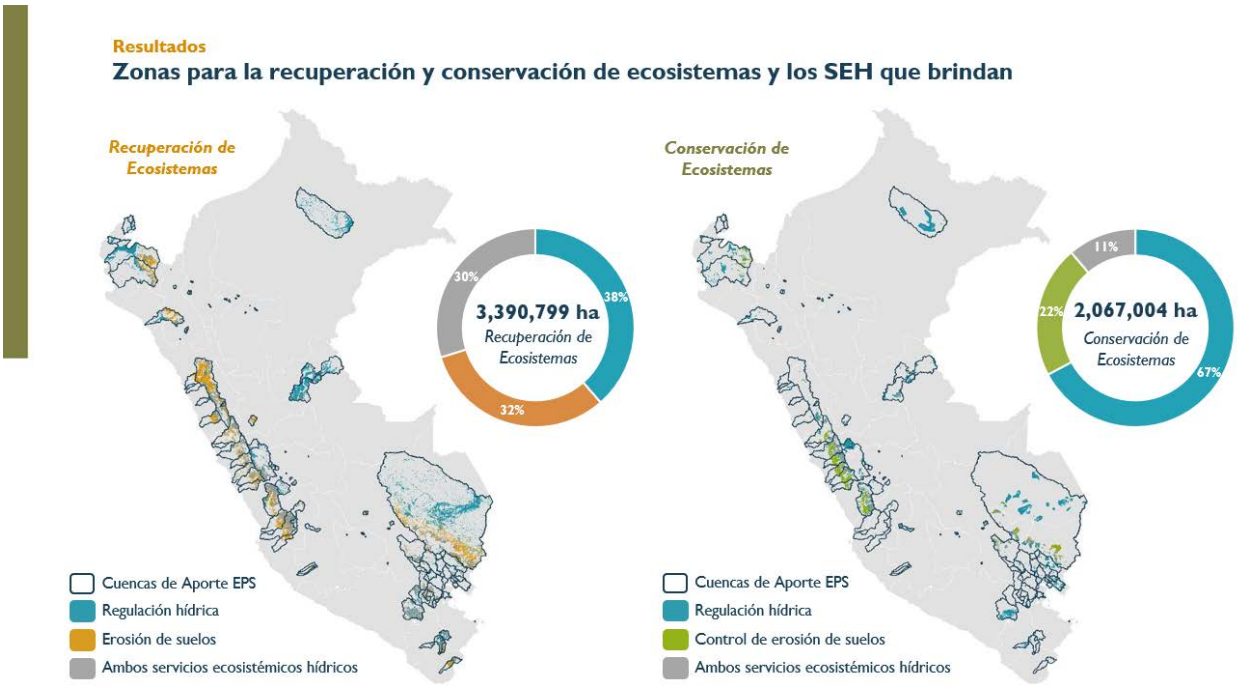
During the first two quarters, Forest Trends and SPDA identified and articulated the need for a classification of the nature-based solutions (NbS) for water that are included as adaptation measures in the Nationally Determined Contributions and in the draft National Adaptation Plan: 13 of the 31 water resource adaptation measures prioritized in the National Adaptation Plan are considered NbS.

As part of the process of updating the National Climate Change Strategy through 2050, MINAM is promoting a discussion on the challenges facing the implementation of climate change solutions. On June 15th, NIWS (led by SPDA and Forest Trends) and MINAM organized a dialogue to identify requirements for creating well-designed NbS. The workshop helped to socialize the idea of considering the nature-based water solutions as a package and resulted in a prioritization of enabling conditions to address across sectors in this field.

#### Support incorporating NI gap in National Sanitation Plan

Since FY2020, Forest Trends and CONDESAN have worked with the Ministry of Housing, Sanitation and Construction (MVCS) to include source water conservation in Peru's updated National Sanitation Plan. This year, CONDESAN led these efforts by updating the HIRO tool in scope and methodology to meet the needs of this policy-making process. In Q1-2, the updated tool and preliminary results were shared with EPS, watershed councils, and other experts in six NIWS priority watersheds, who provided feedback to improve and validate the methodology. In Q3, CONDESAN presented the results of applying HIRO to identify priority areas for the conservation of source waters for utilities across the country to MVCS and ANA, and submitted a final report to MVCS for further comments. The report identifies 5.5 million high-priority hectares for the restoration and conservation of natural infrastructure within 133 watersheds that contribute to 47 EPS throughout the country (See Figure 1-8; for more details see 2.2.1). In addition to the National Sanitation Plan, these results can also be used directly by EPS to develop new projects for the recovery and conservation of watershed services.

**Figure 1-8. Identified areas using HIRO for the recovery and conservation of hydrologic ecosystems and ecosystem services for the National Sanitation Plan**




In Q4, NIWS and MVCS organized a webinar on the *Incorporation of Natural Infrastructure in the National Sanitation Plan*, during which the aforementioned HIRO results were presented in anticipation of the formal approval of the plan. 362 people tuned into the live broadcast and an additional 3,600 people watched the recording of the event afterward. Panelists included Javier Hernández, Vice Minister of Construction and Sanitation; Max Carbajal, Director of Sanitation of the MVCS; and Magdalena Guimac, Specialist in Water Resources and Awareness at ANA.

Once approved by MVCS, it is expected that the National Sanitation Plan for 2021-2025 will include, for the first time, a target for the restoration and conservation of source water ecosystems that supply water to EPS throughout Peru.

### Support normative processes related to MERESE

During FY2021, MINAM began the process of updating the regulations for the 2014 MERESE Law. NIWS provided technical contributions based on lessons learned during the design and implementation of MERESE in the sanitation sector. SPDA and Forest Trends prepared a series of suggestions to MINAM during the preliminary revision of the regulations and the revision of specific proposals in April 2021.

NIWS submitted comments formally and presented them to MINAM during one of the Technical Platform meetings. The comments reflect concerns from NIWS and MERESE implementers that the regulations could create more barriers rather than simplifying pathways for MERESE implementation. Unfortunately, it appears that MINAM is not going to make substantial changes to its regulatory proposal

based on these suggestions. Nonetheless, NIWS will continue to work with MINAM and MERESE implementers to clarify changes and communicate concerns as part of the public review process, and try to find a way forward that results in greater acceptance and more efficient implementation of MERESE in the country.

### Supreme Decree "General provisions for multisectoral and decentralized management of wetlands"

On May 5th 2021, MINAM approved Supreme Decree No. 006-2021-MINAM, which establishes provisions for decentralized and multisectoral management of wetlands under the National Wetlands Committee. This achievement is the result of two years of legal, technical and communications support provided by SPDA, with technical and strategic support from CONDESAN, Imperial College London, and Forest Trends, as part of a participatory process that involved various State institutions and civil society organizations such as ANA, the Ministry of Agriculture and Irrigation (MIDAGRI), Ministry of Production (PRODUCE), INAIGEM, the Research Institute of the Peruvian Amazon (IIAP), and the National Forestry and Wildlife Service (SERFOR). The Supreme Decree represents a key development in Peru's legal framework for natural infrastructure because:

- It is the first detailed regulation on wetlands in the country; it is mandatory for all sectors to follow, both public and private.
- It addresses critical threats affecting wetlands, including peat extraction for commercial purposes, which NIWS has documented in Carampoma, and which is now expressly prohibited, with specific and enforceable sanctions, under this regulation.
- It clarifies the roles and responsibilities of various sectors and agencies (including MINAM, PRODUCE, SERFOR, INAIGEM, SERNANP, ANA, OEFA, OSINFOR, regional and local governments) in the management and conservation of wetlands.

The approval of the regulation was highlighted by a communications campaign, described further in Section 1.1.5 (See *Wetlands*).

### Develop a Roadmap for the Implementation of the National Gender and Climate Change Action Plan

The National Committee on Women and Climate Change (CONAMUCC) has been established with representatives from 36 organizations that have made commitments to climate action and gender equality. CONAMUCC will address the impact of climate change on gender inequality and present ideas to the National Commission on Climate Change (CNCC). The main challenge is the construction of a national gender agenda that articulates the needs and proposals of women in the face of climate change at the local and regional level.

Forest Trends is supporting this process with capacity building to strengthen CONAMUCC and its participation in the CNCC. In Q4, Forest Trends provided technical assistance to CONAMUCC to support its activities including i) appointing representatives to the National Commission on Climate Change, ii) preparing a work plan for FY2022, and iii) holding a virtual training session on climate change and gender. NIWS support for these actions included the moderation and facilitation of meetings and events. These activities will continue in FY2022.

### 1.3.3. Support incorporation of Natural Infrastructure into public investment, focusing on Invierte.pe gaps and Presupuestos por Resultados.

**Support GOREs to program investment and pre-investment for NI**

This year, CONDESAN provided technical assistance to strengthen capacities for the design, mobilization and management of natural infrastructure investments within GOREs Piura, Arequipa and Moquegua. In Q4, three workshops were carried out with the GOREs to assess their understanding of natural infrastructure and related capacity building. Based on feedback from these workshops and internal analysis, a results chain was designed for capacity building to improve the management of natural infrastructure investments, which proposes four areas of work: i) Political-technical advocacy, ii) Technical assistance, iii) Training, and iv) Strategic communication. The process recognizes needs across the project development and execution cycle while emphasizing the critical link of dedicating resources for project pre-investment—the area where NIWS' technical-financial assistance has focused in our work with regional governments to mobilize investments.

During FY2022, NIWS will continue to strengthen the capabilities of the GOREs to manage NI investments throughout the project development cycle, and will provide technical assistance so that they allocate funds for future NI investments and the required pre-investment studies.

**Support legal and regulatory reforms to promote and accelerate investment in NI**

At the beginning of FY2021, SPDA drafted a regulation to promote investments in *andenes* (platform terraces), which was formalized through a draft regulation presented by Congressman Daniel Olivares for the *Law of Productive Andenes*. The regulation would prioritize investments in the rehabilitation and restoration of andenes, focusing on water and food security, and would also explicitly allow EPS to invest in andenes using MERESE funds. Unfortunately, the details of this proposal were not included in the final document approved by the Peruvian Congress.

In Q2, SPDA presented the proposal to MIDAGRI's Agrarian Productive Development Program (AgroRural) for consideration. If approved by Agrorural, it will go to MIDAGRI for review. The delay in response from AgroRural could be related to recent changes in authorities and reorganization in AgroRural.

### 1.3.4. Facilitate coordinated natural infrastructure implementation for water security at the landscape level through approval of Natural Infrastructure in GIRH plans, EPS PMOs, and local/regional development plans

**NIWS' contributions to territorial planning instruments**

This year CONDESAN has contributed to territorial planning by providing technical assistance to the PGRHC and the Concerted Regional Development Plans of the project's areas of intervention. The following summarizes updates for each of the watersheds:

- ChiRiLu watershed: PGRHC design. The CRHC Technical Secretariat informed NIWS of the start of the PGRHC formulation process, for which the project provided three specialists. We are currently awaiting for the participatory workshops to be convened.
- Vilcanota-Urubamba watershed: PGRHC design. CONDESAN has been providing technical

input for the meetings of the technical groups under CRHC. CONDESAN made a presentation of the HIRO tool, complemented with information about the investments in natural infrastructure identified for the watershed. In addition, NIWS has provided technical inputs for the diagnostic phase called "The current watershed", the alternatives analysis called "The ideal watershed", and the development of the selected alternative, "The planned watershed".

- Mayo watershed: PGRHC design. CONDESAN has presented the HIRO results, complemented with information about the investments identified for the watershed, showing the portfolio of EPS projects and the presentation of the initiatives under development with EPS Moyobamba and EPS EMAPA San Martin.
- Chira-Piura watershed: PGRHC update. CONDESAN has been providing support as a facilitator for the virtualization of the process to update the PGRHC update. Soon, NIWS will submit the results of the HIRO tool to the CRHC, complemented with information about the investments identified for the watershed, emphasizing those initiatives supported by NIWS in response to local needs.
- Quilca-Chili watershed: PGRHC update. Next quarter, CONDESAN will submit the HIRO results to the CRHC, in addition to information about the investments identified for the watershed, emphasizing those initiatives supported by NIWS in response to local needs.

In addition to these updates, CONDESAN has also led collaboration with the CRHC to incorporate a research agenda on natural infrastructure in the PGRHC of the Chillon-Rimac-Lurin-Mantaro (ChiRiLuMa), Quilca-Chili and Chira-Piura watersheds (for more information, see Section 2.1.1) .

**Support incorporation of NI into Reconstruccion Con Cambios Integrated Plans to Control Flood Risks**

During FY2021, 10 natural infrastructure projects under RCC have been declared "viable" as part of the RCC's Integrated Plans to Control Flood and Landslide Risks in vulnerable watersheds. Altogether, these viable projects are valued at more than USD 186 M. This portfolio of projects is unprecedented in the country—the portfolio includes natural infrastructure for disaster risk management and has a guaranteed budget for its execution. Nine of these projects were developed with technical assistance provided by Forest Trends during 2020 and the first quarter of 2021, and the NI and DRM Investment Development course that took place between November 2020 and January 2021: Zaña (USD 16.6 M), Tumbes (USD 2 M), Casma (USD 26 M), Matagente (USD 17.1 M), Chicama (USD 13.7 M), Cañete (USD 21.9 M), Huarmey (USD 8.5 M), Mala (USD 46.4 M) and Olmos (USD 33.9M). While the tenth project, Lacramarca (USD 16 M), did not receive direct technical assistance, it is also progressing under the overall process led by ARCC and MIDAGRI with support from NIWS and is expected to include NIWS-supported methodologies in its final stages.

Another natural infrastructure project in Virú is expected to be declared viable next quarter. Forest Trends will also continue to support the development of natural infrastructure projects in at least two other watersheds (Piura, Chancay-Lambayeque, and potentially Rimac).

**Figure 1-9. Current state of natural infrastructure investments in the RCC watersheds that are receiving NIWS technical assistance (September 2021)**


The *Nature Cares for Us* communications campaign and photography contest (described in Section 1.1.5) aims to disseminate the benefits of the RCC Integrated Plans and NI projects for residents and position NI as a strategy for DRM.

### 1.3.5 Build institutional capacity, with a focus on local and watershed level institutions, to increase women's participation in decision-making on natural infrastructure and water resources

**Provide institutional strengthening support to watershed councils and ANA, including for mainstreaming gender**

Institutional strengthening of watershed councils

This year, SPDA prepared a diagnosis of the institutional, legal and structural gaps within the Watershed Resources Councils (CRHC) in order to identify solutions to the challenges of implementing their watershed resource plans (PGRHC). As part of the diagnosis, SPDA evaluated opportunities to link PGRHC with formal planning instruments in order to reinforce their binding nature and promote their implementation. The diagnosis was used to prepare draft guidelines to strengthen the PGRHC for ANA to consider publishing as a resolution.

During Q3, the guidelines were presented to ANA's Project for the Modernization for Water Resources Management for review. In Q4, ANA responded that while establishing the PGRHC as legally binding documents is a priority, the proposal was not in line with what they had in mind; they plan to

strengthen the PGRHC through implementing practical actions rather than changing legal structures. Forest Trends will analyze alternatives to strengthen the PGRHC during FY2022.

Mainstreaming gender in ANA

Forest Trends began the process of mainstreaming a gender approach within ANA in FY2020. Throughout FY2021, ANA has been reviewing the proposed Institutional Gender Diagnosis and Gender Mainstreaming Plan submitted by Forest Trends, but has yet to approve either document. Recently ANA has renewed their commitment to finalizing, approving, and implementing this plan. More details on this process can be found in Section 4.2.

**Provide institutional strengthening support to EPS, with an emphasis on SEDAPAL, and SUNASS, including for mainstreaming gender**

Institutional strengthening for MERESE implementation - SEDAPAL

Throughout FY2021, Forest Trends has provided continuous technical assistance to SEDAPAL's Environmental and Ecosystem Services Management Unit (EGASE) and other areas including their Executing Unit, Project and Construction Management Division, Projects Team, Procurement team and other officials, in parallel with the development of public MERESE Projects (see section 3.2.1).

In order to consolidate this technical assistance, Forest Trends has prepared a manual for the development and evaluation of natural infrastructure projects under SEDAPAL's MERESE program. The objective is to identify guidelines and procedures within SEDAPAL for the development of natural infrastructure projects to expedite the development of Public Investment Projects (PIPs) towards their viability. The manual is currently being reviewed by SEDAPAL; once approved, this manual will be incorporated into SEDAPAL's procedures for mobilization of MERESE investments. The development of the manual has also generated a range of lessons learned and guidance that can be useful to advancing MERESE in other institutions throughout the country.

Mainstreaming gender in SUNASS

In parallel to the gender process with ANA, Forest Trends has also been implementing a gender mainstreaming process in SUNASS since FY2020. SUNASS has demonstrated leadership in this area, and this year even approved a Gender Policy—making it one of only three institutions in Peru with an institutional gender policy. More details on this process can be found in Section 4.2.


Community workshop of a monitoring system that will support local decision making on natural infrastructure and water security in San Andres de Tupicocha, Lima, Perú, January 2021 (Photography: CONDESAN)

# Objective 2: Information Management Improved for Decision Making on Natural infrastructure

## IR 2.1 Information generation for decision-making on natural infrastructure improved

### 2.1.1. Establish technical working group on Natural Infrastructure and shared research agenda

**Convene a technical group of leading research and knowledge management institutions to prioritize green infrastructure research**

This year the National Institute of Glaciers and Mountain Ecosystems Research (INAIGEM) established the Mountain Technical Group (GTM) and held its first three meetings. The GTM provides an important opportunity to coordinate efforts between public entities, NGOs, and international groups, and align common objectives. CONDESAN, who represents NIWS in the GTM, attended all three meetings during which the group approved its internal regulations; discussed a proposal for its Glaciers and High Mountain Ecosystems Policy; discussed and approved the annual work plan for 2022; discussed potential collaboration with international initiatives like the Food and Agriculture Organization (FAO)'s Alliance for Mountains and its Andean Mountain Initiative; and established a committee to coordinate celebrations for the International Day of Mountains on Dec 11th. The fourth meeting will be held in Q1 FY2021 to further discuss the Glaciers Policy.

**Develop and publish Natural Infrastructure Research Agenda**

In FY2021, CONDESAN developed three natural infrastructure research agendas for the Chillon-Rimac-Lurin-Mantaro (ChiRiLuMa), Quilca-Chili and Chira-Piura watersheds, as part of the efforts to support ANA's Academic Water Roundtable in establishing a National Research Agenda. The agendas were developed by balancing the informational needs of decision makers, research priorities from the academic sector, and actual problems in each watershed. The three agendas were coordinated with the technical secretaries of each CRHC for their incorporation into their watershed resource plans (PGRHC). The agendas were consolidated into an internal document, which will be revised and presented to the CRHCs and Academic Water Roundtable next quarter. CONDESAN will continue to develop regional agendas in the Vilcanota-Urubamba, Tambo-Moquegua, and Mayo watersheds during FY2022.

### 2.1.2 Systematize relevant hydrometeorological datasets and socio-economic datasets and process for use in NIWS analyses

NIWS is working to build high-value datasets to support investment prioritization and hydrological modeling in Peru. This year, CONDESAN continued to lead this effort through the development of an analysis on vegetation cover, a national evaporation dataset, and a national wetland inventory. This data strengthens the estimation of hydrological benefits of natural infrastructure measures at all levels (planning, project development, and watershed management).

**Multitemporal analysis of vegetation cover**

In Q1, CONDESAN and the consulting team finished an analysis of land use and change in the Vilcanota-Urubamba watershed, which completed NIWS' efforts to develop a database of land use in the six NIWS priority basins. This information has since been used as input to design ecohydrological investigations in the ChiRiLuMa watershed, and to improve the HIRO tools (versions GRD and SEH—see Section 2.2.1).

**Map existing data sources to meet information needs**

CONDESAN worked together with the national hydrometeorological service, SENAMHI, to develop national reference data on evapotranspiration (PISCO ET0). NIWS contracted the services of a consultant to develop the data, which has been validated and strengthened by sensitivity and uncertainty analyses. A corresponding scientific article has already been written in English and Spanish, and will be submitted to *Scientific Data*, a peer-reviewed, open-access journal published by *Nature* next quarter. The evapotranspiration data has been incorporated into the newest version of the CUBHIC tool (CUBHIC 2.0—see 2.2.4).

**Prepare wetland inventories in priority watersheds**

CONDESAN also led NIWS' partnership with INAIGEM to develop the first National Wetlands Inventory, which will provide improved GIS information of wetlands in Peru and serve in updating the National Ecosystem Map. NIWS contracted a consultant who developed a methodology for the inventory and validated it in the field with various actors within the six NIWS priority basins, all under CONDESAN's and INAIGEM's supervision. The validated methodology has been presented to INAIGEM. The inventory will be developed at a national level and validated by the National Wetlands Committee in FY2022.

### 2.1.3 Strengthen, expand, and facilitate hydrological and socio-economic monitoring network

**Assess monitoring equipment needs in existing iMHEA monitoring sites in priority watersheds (ChiRiLu & Piura), and install new hydrological monitoring equipment in learning sites**

Imperial College London and CONDESAN teams have continued to coordinate and develop novel research designs and evaluation methods for the ecohydrological monitoring of natural infrastructure interventions. This year, NIWS established two new hydrological monitoring sites which will generate data to support the evaluation of the impact of natural infrastructure, in the Lurín and Cañete watersheds.

San Andres de Tupicocha monitoring system (Lurin watershed)

NIWS has established a monitoring site in the rural community of San Andrés de Tupicocha in the Lurin watershed of Lima. In Q1, the team visited the field and identified two areas for evaluation: the Chanchana forest and the Sansare Reserve. The team also visited the micro-basins that provide water to the community and surveyed existing amunas.

In Q2, Forest Trends signed an MOU with the community to formalize the monitoring site, allowing monitoring and research efforts to begin. CONDESAN's technical team developed an integrated monitoring plan based on the ChiRiLuMa research agenda, which includes ecohydrological and socioeconomic components. The monitoring plan and proposed site locations were presented to the community for approval and validation in Q4. After the community approval, NIWS purchased the monitoring equipment and started to install equipment to measure rain, evaporation and evapotranspiration in the area.

This effort is a model for community involvement in the validation and installation of a system that will support local decision making on natural infrastructure and water security. The data generated will be analyzed and processed through student research projects (up to 5 theses have been identified to receive direct NIWS support), consultants and NIWS staff efforts. Two of the consultancies were started this year: the first consultant is studying the impact of vegetative cover on erosion, and the second is studying the impact of puna grasslands on soil and water regulation. Terms of Reference (TOR) for three more have been prepared and will be released in Q1 FY2022.

**Figure 2-1. Community Validation workshop in San Andres de Tupicocha. July 2021.**

Cañete monitoring system (Incubator)

NIWS is also establishing a hydrological monitoring system in the upper Cañete river basin, an effort that was submitted to the NIWS Incubator by MINAM's Environmental Economics and Finance Direction, in coordination with their MERESE-FIDA project. The implementation of this system has been completed through inter-institutional collaboration and active participation from the local population. Building on the monitoring design previously developed by NIWS with the MERESE-FIDA project and local stakeholders, the system was implemented this year, with MINAM leading the construction of weirs to measure in-stream flow and NIWS leading the purchasing and supervision of other monitoring equipment, including rain gauges and sensors. In Q1, the team visited the field to validate the monitoring points in the design, and provide technical support for the implementation. The monitoring equipment was purchased in Q2, and installed in Q3 and Q4 with support from the MERESE-FIDA and the National Service of Protected Area (SERNANP) teams.

NIWS is developing a training workshop on operation and maintenance (O&M) for the MERESE-FIDA and SERNANP project teams who will be responsible for the systems, which will take place in FY2022.

**Figure 2-2. Installation of a sensor on a flow weir in Cañete**

## iMHEA Assemblies

The second part of the virtual sessions of the Regional Andean Ecosystem Hydrological Monitoring Initiative (iMHEA) 2020 Assembly were held this fiscal year. After the fourth and final event, CONDESAN documented the process in the "iMHEA 2020 Assembly: A Decade of Participatory

Hydrological Monitoring in Andean Ecosystems" report, which summarizes the discussions from the four events and outlines recommendations for future work. The three meetings held in FY2021 are summarized below:

- October 15th, 2020: The iMHEA partners discussed the new hydrological monitoring protocols that NIWS is developing for iMHEA, and reviewed priority research questions and progress in the development of the protocols.
- November 12th, 2020: The third session focused on the iMHEA research agenda, identifying priority issues for the agenda through working groups. The iMHEA partners also discussed how to guarantee fair access and responsible use of the information generated by monitoring sites. The group started to develop the iMHEA roadmap, and discussed progress on the monitoring protocols.
- January 28th, 2021: The main objectives of the last session were to discuss a strategic route for the next decade of iMHEA, make progress on the Hydrological Monitoring Methodological Guide, and discuss proposals for iMHEA's Annual Assembly 2021. CONDESAN presented a report on the current status of the iMHEA network, its partners, and monitoring sites; and the monitoring protocol for hydrophysical properties of soil for feedback. Throughout the meeting, information was collected for the development of the 2021-2030 roadmap and iMHEA Research Agenda.

**Strengthen the iMHEA network institutionally as a network and community of practice, providing technical support to member research efforts**

In FY2021, CONDESAN strengthened the iMHEA network through participating in its leadership. iMHEA's new regional coordinator, Luis Acosta, formed a new Directive Board for iMHEA: three of its six other members are associated with NIWS including Dr. Wouter Buyatert, Dr. Boris Ochoa-Tocachi, and Javier Antiporta—who will serve as iMHEA's Regional Technical Assistant. In Q3, the board met to discuss the need to prioritize the next iMHEA assembly and update the iMHEA Methodological Guide for Hydrological Monitoring of Andean Ecosystems. In Q4, CONDESAN met with the iMHEA regional coordinator to define a work plan for collaboration between NIWS and iMHEA for FY2022, which includes improving technical and scientific capacities, generating hydrometeorological information and knowledge in Andean watersheds, and strengthening the iMHEA network as an institution. These activities will strengthen the iMHEA network, as the NIWS project comes to the end of its term. NIWS will begin to prepare ToR for the implementation of these activities in FY2022 Q1.

NIWS also supported iMHEA by developing the iMHEA methodological guide and corresponding monitoring protocols (discussed below), and a data management platform for iMHEA's hydrometeorological data (Section 2.2.3).

**Produce and disseminate monitoring protocols**

The iMHEA Hydrological Monitoring Guide is the foundational resource for the iMHEA network and will guide the regional initiative for the next decade (2021-2030). This year, CONDESAN and Imperial College London have been supporting iMHEA to update and expand the Guide, through the inclusion of new monitoring protocols. These protocols define methodologies to evaluate the impact of NI interventions on water quality and quantity outcomes. The protocols are largely being developed

through consulting contracts, with the close technical supervision of NIWS, MINAM, SUNASS, and iMHEA leaders. We expect the hydrological monitoring protocols to be published not only by iMHEA but also by MINAM and SUNASS, and to be included in the set of official tools for public investments promoted by these entities.

There are three protocols currently under development by NIWS. Final drafts have been completed for two of them: 1) hydrophysical properties of soil and 2) precipitation and flow. These drafts have been approved by iMHEA, MINAM, and SUNASS, and have been submitted to the NIWS communications team for final graphical edits and publication. These two were delayed due to poor quality encountered in the first contract executed to develop the protocols in Q1; the contract had to be terminated and put out to bid again. A third protocol on ecohydrological monitoring of tropical andean ecosystems is currently being developed and is also expected to be published in FY2022.

### 2.1.4 Facilitate active learning, knowledge management and capacity-building with natural infrastructure agenda partners

#### Prepare meta-analyses of current state of knowledge

This year, NIWS continued to publish policy briefs and scientific articles on natural infrastructure that bring critical knowledge on the benefits and limits of natural infrastructure for water to decision-makers. In January, NIWS published a meta-analysis and policy brief on the impacts of *andenes* (platform terraces) and terraces on water and soils entitled, *Impacts of Andenes and Terraces on Water and Soil: What Do We Know?*. The study, developed by NIWS with leading national experts in these technologies, Dr. Bram Willems and Dr. Douglas Walsh, presents a literature review of terraces as ancestral and community practices of water and soil conservation, with particular focus on Peru. The brief has generated significant interest, especially since its publication coincided with a recent law that declared the rehabilitation and conservation of *andenes* a national interest (Law N° 31077). Its launch webinar attracted the greatest number of participants in the NIWS webinar series throughout the year and is the 2nd most viewed webinar for the year.

In June, NIWS published a systematic review and policy brief on natural infrastructure and disaster risk management entitled, *Natural Infrastructure for the management of erosion and flood risks in the Andes: What do we know?*. The study, developed by NIWS in collaboration with world-leading researchers from the University of Louvain, presents a literature review of the impacts of natural infrastructure on erosion, landslides, and flooding in the Andes. It was launched in a webinar co-organized by the leading disaster risk management authorities in Peru, ARCC and CENEPRED, in the third most-attended NIWS webinar of the year, permitting the publication to directly reach decision-makers actively incorporating natural infrastructure into disaster risk management approaches.

In August, NIWS published a scientific article in the academic journal *Integrated Environmental Assessment and Management* entitled, *Producing valuable information from hydrologic models of nature-based solutions for water*. The article draws together lessons from a number of practical efforts

to support evidence-based decision-making, including an effort led by NIWS with the National Water Authority and the World Bank in the Chancay-Lambayeque watershed. The paper helps to identify common problematic assumptions that impact the process of information development, communication and use between analysts, advocates, and implementers in an effort to improve future approaches. This paper was prepared with the participation of CONDESAN, Forest Trends and Imperial College London, in collaboration with researchers of the University of Minnesota and the University of Hawaii. It was published in a special, open-access series of the journal aimed at connecting science with the United Nations Sustainable Development Goals (SDGs).

In September, NIWS published a scientific article on the hydrology of Andean grasslands in the *Science of the Total Environment* (STOTEN) Journal entitled, *Progress in understanding the hydrology of high-elevation Andean grasslands under changing land use*. The study highlights an urgent need to carry out greater monitoring efforts in *puna* grasslands, which are less understood than *paramo* grasslands. While there is more information about *paramo* grasslands, these ecosystems are almost non-existent in Peru. The study also concludes it likely takes at least 5 years to find evidence of restoring hydrological functions in these ecosystems. Authors include Dr. Giovanni Mosquera of the University of Cuenca, who was contracted by NIWS to lead this research, Dr. Peggy Stern of EcoDecision, Dr. Vivien Bonnesoeur and Dr. Francisco Roman of CONDESAN, and Dr. Boris Ochoa-Tocachi of Imperial College London. The article has been well-received by colleagues, scientists and practitioners, and NIWS is now preparing the public-facing publications, including a new policy brief, based on the research. The publications in respected international journals give credibility to the research being carried out by NIWS.

Table 2-1 summarizes the research published by NIWS during FY2021.

**Table 2-1. FY2021 Policy Briefs and Scientific Publications**

| Title | Date Published | Type | Collaboration |
|---|---|---|---|
| Impacts of Andenes and Terraces on Water and Soil: What Do We Know? | 19 January 2021 | Policy Brief | Water Competency Center (Bram Willems) and Douglas Walsh |
| Natural Infrastructure for the management of erosion and flood risks in the Andes: What do we know? [3] | 1 June 2021 | Policy Brief | University of Louvain |
| Producing valuable information from hydrologic models of nature-based solutions for water | 16 August 2021 | Scientific Article, *Integrated Environmental Assessment and Management* Journal | University of Minnesota (Kate Brauman) |
| Progress in understanding the hydrology of high-elevation Andean grasslands under changing land use[4] | 4 September 2021 | Scientific Article, *STOTEN* Journal | University of Cuenca (Giovanny Mosquera), Ecodecisión |

Dr. Ochoa-Tocachi is also supervising a scientific article based on 2019 research by Imperial College London (ICL) graduate student Maria Monge on the ecosystem services of natural and artificial

[3] Corresponding scientific article was rejected by WIREs Water magazine in Q3, but has been re-submitted to *SOILS* journal in Q4.

[4] Corresponding policy brief will be developed in FY2022

high-altitude wetlands (bofedales) and the impact of human management on these ecosystems. The article will be finalized in Q1 FY2022 and submitted to the STOTEN journal.

**Develop criteria and processes for implementing demand-driven mechanism of address knowledge gaps**

NIWS Scholarship Program

NIWS scholarships provide a financing mechanism to address research gaps identified in the NI research agendas, support young scientists in natural infrastructure, and help close gender gaps in the field. This year, CONDESAN led coordination with ANA to nest the scholarships under ANA's 2021 National Water Culture Award (*Premio Nacional Cultura del Agua*). This positioning of NIWS scholarships under a national institution consolidates the training of new professionals in NI and water security and increases the chances research efforts continue after the life of the project.

**Roberto Salazar**

Head of National Water Authority

National Water Culture Award opening


The scholarships were officially announced on August 26th, 2021 as part of a special "H2O research" category offering awards for 13 new research projects ($5,000 each) and 10 published studies ($1,000 each). NIWS contributed to developing the virtual platform to host the contest, as well as drafting the contest guidelines to guide applications towards research needs in the field and prioritize research about gender issues and led by women researchers. NIWS will also fund the awards. In September, NIWS organized 4 webinars with ANA to disseminate the opportunity to apply for the program.

Applications will be accepted until October 19th and the final awards will be announced in early FY2022. CONDESAN will also serve on the selection committee and supervise the awarded researchers.

International alliances for innovative research

NIWS participated in the Iberoamerican Workshop on Water Harvesting Systems organized by AECID (Spanish Agency for International Development Cooperation) in April. NIWS presented several experiences and studies including systematic reviews on infiltration trenches, forestation, and terraces.

CONDESAN and ICL also supported several proposals prepared by leading researchers to carry out innovative research on natural infrastructure in Peru. The proposals were submitted to fund the researchers and their students—they were not designed to fund NIWS Consortium institutions. The proposals are still seeking successful funding opportunities:

- Sediment modeling in tropical Andean watersheds using turbidity data from water utility plants in Peru, by Professor Beverley Wemple at the University of Vermont (USA).
- Evaluation, monitoring and isotopic modeling of Andean watersheds, by Alicia Correa from the University of Giessen, Germany with iMHEA. Dr. Correa has been involved in the iMHEA network since her time at the University of Cuenca.
- Evaluation, monitoring and isotopic modeling of Andean watersheds, by Dr. Christian Guzmán from the University of Massachusetts, USA who spoke to NIWS team members at the American Geophysical Union (AGU) Conference in 2019.

**Implement demand-driven mechanism to support research that contributes to prioritized knowledge gap**

The NIWS scholarship program supports research in natural infrastructure, water resources and management. As discussed in Section 2.1.1, the 2021 NIWS scholarship program has been institutionalized under ANA's National Water Culture Award. In parallel, NIWS has been supporting 4 thesis projects awarded through last year's pilot scholarship program. The first thesis has been completed, receiving final approval from the University's review board: Ida Vilca's (UNALM) thesis on the influence of vegetative cover on water regulation in Ayacucho. The results show a significant and positive impact of the vegetation cover of grasslands and wetlands on the annual water regulation in the Apacheta basin, an important water source for the city of Ayacucho.

Two others are close behind. Sandro Arias and Engelbert Barreto's draft theses have been approved by their academic supervisors and NIWS. Sandro Arias' (UNSAAC) thesis measures runoff in the Millpu Micro-watershed of Lake Piuray (Chinchero-Cusco-Peru). Engelbert Barreto's (PUCP) thesis studies the socio-economic and institutional factors that influence the adoption of ancestral water management practices. The fourth thesis will be finished in FY2022: Samanta Onocuica's (UNALM) thesis on the characterization of eco-hydrological units and their level of degradation and erosion in San Andres de Tupicocha. This year she finished mapping the eco-hydrological units and completed her fieldwork. Overall her research was delayed as she had to change sites due to social conditions in the rural community of Huamantanga, which caused her to switch locations to San Andrés de Tupicocha. In the future, NIWS can make use of all of these research efforts by disseminating the results and using them for training and project development.

**Prepare guidance on ecosystem evaluation and restoration**

NIWS has been working with MINAM to develop guides for their series on native ecosystem evaluation. Previously, MINAM published guides on dry forests, *yunga* forests, and wetlands. This year, NIWS has worked with MINAM to develop two new guides for relict forest and *páramo* grasslands. These guides serve as a reference for project development, specifically for the assessment of the state of ecosystems (conserved/degraded) through fieldwork during the initial diagnostic for a project and the identification of restoration and conservation activities. The evaluation indicators within the guides can be used to monitor the recovery of ecosystems and their services during the evaluation and monitoring stages of a project. These guides will serve NIWS project developers, and the collaboration between the two entities ensures the guides also serve a wider audience outside NIWS.

The technical content for the two guides has been finalized, reviewed, and validated with experts. They are now ready for final layout edits from the communications team, before publication by MINAM. Next year, NIWS and MINAM will follow up on the use of these guides and work together to develop a new guide for andean shrubland (*matorral)* ecosystems.

# IR 2.2: Information sharing to support decision-making on GI improved

## 2.2.1 Build and deploy tools and capacities for rapid assessments on NI priorities within performance-based frameworks, including systems integration for access to basic data critical for rapid assessments.

### HIRO Rapid-Focus Tools for Natural Infrastructure Interventions

Throughout FY2021, CONDESAN and Imperial College London have continued to improve the HIRO tool for the identification of natural infrastructure opportunities—through the development of the HIRO-SEH hydrological ecosystem services tool and corresponding methodological guide, the HIRO online platform, and the HIRO-Ambiente disaster risk management platform with MINAM. Together, these tools help to address knowledge gaps in natural infrastructure. Specifically, the success and interest in HIRO-SEH has opened up multiple possibilities for further improvement and integration.

HIRO for Hydrological Ecosystem Services (HIRO-SEH)

HIRO-SEH supports the identification of natural infrastructure for project development, planning, and watershed management; this version differs from the previous HIRO-GRD tool for disaster risk management because it focuses on hydrological ecosystem services (water regulation and erosion control). This year, NIWS collaborated with the Ministry of Housing, Construction and Sanitation (MVCS) to use HIRO-SEH to update the National Sanitation Plan for 2021-2025. In Q1, NIWS used HIRO-SEH to identify areas for the conservation of water resources for 48 EPS and 130 contributing watersheds. NIWS also validated the tool and results through a series of 14 virtual workshops with stakeholders from the EPS and CRHC of the six NIWS priority basins. Comments from this process were subsequently incorporated to improve the HIRO-SEH tool. In Q2, NIWS redid the modeling using the updated version of the tool. In total, 5.4 million ha were identified for the conservation of water resources in the sanitation sector, of which 38% are earmarked for ecosystem conservation and 62% are areas in need of ecosystem recovery. The new results represent a more refined result with higher levels of confidence and have been incorporated in a final report for MVCS to consider in the updated National Sanitation Plan (see Section 1.3.2). HIRO-SEH results were also used in ETs for interventions by EPS Emapa San Martín, EPS Moyobamba, and EPS Grau, as well as in reference documents for the selection of plant species for natural infrastructure.

In Q3, a first draft of the corresponding HIRO-SEH methodological guide was completed and reviewed by CONDESAN. In addition to providing a step-by-step process, the guide also presents results from applying HIRO-SEH across Peru, identifying areas with high potential to provide hydrological ecosystem services (approximately 29 million ha for water regulation and 15 million ha for erosion control) as well

as areas with existing conditions of extreme soil erosion (20 million ha). The analysis also identifies potential areas for the restoration (8.2 million ha) and conservation (6.7 million ha) of zones of hydrologic value at the national level.

HIRO Online Platform

CONDESAN has also been developing an online HIRO platform, which will make HIRO results freely available to the public including academics, students, decision makers, and project developers. The platform will give users an initial idea on which areas are suited for the different types of NI interventions. A consultant began development of the online platform in July. So far, they have made a mock-up of the website and started the programming efforts.

HIRO-GRD and HIRO-Ambiente

CONDESAN is also leading NIWS' efforts with MINAM to develop HIRO-Ambiente, an online resource for the evaluation of NI interventions as part of disaster risk management. HIRO-Ambiente integrates the use of two existing tools: NIWS' HIRO-GRD and MINAM's Rapid Identification of Action Measures (IRMA) tool which identify areas to implement NI for disaster risk management at different scales of analysis. This has been an important opportunity for HIRO-GRD to be improved by MINAM's technical team, adapted for national applications (compared to previously just RCC's prioritized basins), and institutionalized throughout the national environment sector with greater visibility, influence and use. In Q3, NIWS met with MINAM and SENAMHI to discuss the efforts. MINAM presented their suggestions on updates to improve the HIRO-GRD model. In Q4, CONDESAN incorporated the suggested updates, met with MINAM to discuss automation at the national level, finalized the model, and hired a consultant to implement it online. During FY2022, the consultant will finalize the online implementation of HIRO-Ambiente and NIWS will promote its use and results at the national level.

**Develop and publish guide: Using Hydrological Models to Design Natural Infrastructure in Peru**

This year, CONDESAN and Imperial College London spent significant effort in developing the Hydrological Modeling Guide for the Evaluation of Natural Infrastructure, a fundamental document for NIWS. As the field of NI modeling has not yet been highly developed, this guide will stand out as the go-to modeling reference for this subject. The target audience includes a broad range of professionals, public and private institutions who implement or invest in natural infrastructure interventions, as well as students and academics who conduct hydrological modeling as part of their research. Even though the document has not yet been published, it is already being used to standardize the estimation of hydrological benefits by NIWS. The delays to the initial schedule are due to the length and complexity of the document, as well as the many parties involved in its development, review, and translation.

The Spanish version of the document has been finalized, and the English version is currently being copyedited. The bilingual diffusion of the content will enable a wider diffusion and greater impact. The guide will be published in FY2022, accompanied by a webinar and training courses.

**Prepare recommendations on methodologies and models to estimate the green infrastructure gap and to evaluate green infrastructure projects, in terms of relevant Public Investment indicators**

This year, CONDESAN led development of two reference documents to support the selection of plant species for natural infrastructure projects that involve vegetative cover, with support of a consultant hired by NIWS and contributions by EcoDecision. The first is a species list to help users identify appropriate plants for hydrological ecosystem services. The second is a database of public nurseries that supply plants for water regulation and soil erosion control, within the NIWS priority watersheds.

These products are already being used by CONDESAN and Forest Trends to support project development with GOREs and RCC, and to develop a methodology for the selection of plant species for disaster risk management within RCC. They can also serve as inputs to develop the technical specifications for revegetation and reforestation projects for the catalogue of natural infrastructure measures. Next quarter, the species list and nursery inventory will be published online for wider use. CONDESAN will also prepare a scientific article based on the species list, which describes the relationship between the morphological characteristics of plants and the hydrological ecosystem services they provide.

**Quantify benefits of NI portfolios**

CONDESAN and Imperial College London completed hydrological modeling for the Quilca-Chili and Tambo-Moquegua watersheds, as part of the larger effort to develop strategic case studies for these areas by the Blended Finance team (described further in Section 3.1.4). The modeling helps to better understand future scenarios and support decision-making in water resources. The team modeled four scenarios: baseline (current), business-as-usual, pessimistic, and optimistic. During FY2022, these results could also be used to include natural infrastructure in the local water resource management plans (PGRHC). As part of the modeling effort, the team:

- documented the importance of analyzing modeling results based on desired hydrological objectives specific to each project.
- improved the hydrological modelling methodology, particularly in the calibration and validation of the modelling outputs, and the definition of land cover and soil-type categories and databases to improve natural infrastructure representation.
- developed a flowchart to guide the hydro-economic evaluation of natural infrastructure projects, which shows interactions and feedback in the design process for natural infrastructure investments.

This year, the modeling team also spent significant effort in estimating the impact of natural infrastructure on flow rates and erosion within 6 RCC watersheds (Cañete, Mala, Huarmey, Rímac and Chicama) using the KINEROS2 hydrological model. These results were presented to RCC and served to inform the decision-making process, but will not be published. Although a policy brief was almost complete, having gone through several review processes and revision, the final reviewers did not have sufficient confidence in the methodology to publish the final conclusions, which were very optimistic compared to other natural infrastructure estimates.

**Quantify benefits of NI projects**

CONDESAN is developing a database for internal use to track data from all of the NI projects promoted through NIWS. Given the large number of investments promoted through NIWS (approximately 70 projects), the development of this database has required a lot of work, time and coordination between the various groups involved. Along with other technical and investment information, the database will contain estimated hydrological benefits for each project, which are required for their project profile and *Expediente Tecnico (ET).* CONDESAN has estimated benefits for 13 projects in more mature stages of project development using a new version of CUBHIC (CUBHIC 2.0—see Section 2.2.4), as we show in Annex 10.

### 2.2.2 Train portfolio designers, project developers on appropriate use of existing models and tools for quantifying the benefits of Natural Infrastructure, including explicit consideration of risks and uncertainties

**Virtual workshop on tools to support decision-making on NI**

In Q2, NIWS collaborated with the Water Competency Center to organize the "Science and Engineering for Water Management in the Andes" seminar as part of ExpoAgua. NIWS presented state of the art scientific evidence on the hydrological benefits of nature-based solutions, including the project's recently published study on amunas in Huamantanga and systematic reviews on forests, infiltration trenches, andenes (terraces); and solutions proposed to strengthen project development from public investment in the Andean region.

In Q3, CONDESAN's Dr. Francisco Roman gave a presentation on the dissemination of scientific knowledge for decision making, as part of the Voces por Agua event for communicators organized by NIWS). The presentation discussed the communicational needs that arise from research processes carried out by NIWS, using specific NIWS tools and publications as examples. This provided an important opportunity to disseminate these products among the press and other communicators, as well as engage and maintain their interest in NIWS' work.

In Q4, CONDESAN presented the HIRO tool in a webinar, as part of ANA's Capacity Building Program (See Section 1.3.1). This presentation opened up possibilities for HIRO to be used to develop and update local watershed resource plans (PGRHC). After the webinar, the Caplina-Locumba Watershed Resource Council (CRHC) in Tacna reached out to NIWS requesting information on the HIRO results in their watershed. CONDESAN will follow up with them about opportunities to use HIRO to identify NI for their PGRHC.

### 2.2.3 Support systems integration and capacity-building for accessing data for qualitative and quantitative assessments of natural infrastructure

**Support systems integration and capacity-building for accessing data for qualitative and quantitative assessments of Natural Infrastructure**

NIWS is developing a data management platform for the iMHEA network to manage its hydrometeorological data and provide online access to monitoring data. This system, which has been highly anticipated for many years, is now needed more than ever as iMHEA and NIWS are expanding the variables and sites that are being monitored. This year, NIWS contracted a software developer, supervised by Imperial College London, who adapted existing software developed by the Water Fund of Quito (FONAG) and the Water Utility of Quito (EPMAPS). The system was finalized in Q4 and will be hosted on a server at Imperial College London for use throughout FY2022. Once fully functional, NIWS will use the system to access data for the evaluation and modeling of interventions in natural infrastructure.

### 2.2.4.Build new models and methods to address assessment needs; adjust existing models to reflect learning from monitoring network and natural infrastructure agenda

**Propose specific changes and improvements to CUBHIC**

A new version of the CUBHIC tool for the estimation of hydrological benefits of natural infrastructure projects has been developed by Imperial College London and CONDESAN. CUBHIC 2.0 is an important improvement over the previous version, both in the depth of content (e.g., equations have been further developed) and form (e.g. scenarios and model calibration). CUBHIC 2.0 allows for the estimation of hydrological benefits at the micro-watershed level, not just by intervention. The model also incorporates recent developments from the NIWS project, such as the new evapotranspiration dataset developed with SENAMHI, discussed in Section 2.1.2. It is capable of producing outputs in terms of a hydrograph covering a full water year, greatly increasing potential uses.

CUBHIC 2.0 models have been developed for the five types of interventions available in the previous version of CUBHIC (forest conservation or restoration, grassland conservation or restoration, wetland conservation or restoration, infiltration trenches, and qochas) as well as for a new type, amunas. An additional CUBHIC module on evapotranspiration, specifically, has also been developed to accompany the set. CUBHIC 2.0 was presented internally to the NIWS team in Q4. In FY2022, NIWS will socialize the new methods with key partners like the ANA, develop technical primers to accompany each model, and develop a communications strategy to present CUBHIC 2.0 to potential users.

**Develop regionalization model for NI impact estimation**

Dr. Ochoa-Tocachi co-supervised an ICL graduate student's work updating iMHEA's regionalization model. A statistical model was developed to estimate the impacts of different human practices (cultivation, grazing, afforestation, conservation) on water flows. Using iMHEA's data, unit hydrographs

were derived for 24 paired catchments across 9 sites within the iMHEA network. The analysis showed that catchments with intensive land-use tend to have more drastic hydrological responses than their natural counterparts. The thesis has been finalized and is available for use.

### 2.2.5 Build a network/cadre of new women leaders and champions for NI through

**Women in NI Leadership Program**

This year, NIWS concluded the first round of our Women's Leadership Program in Water Management, celebrating the closing in October with the representation of the MInistry of Women and Vulnerable Populations, USAID, Canada, and 72 women leaders whose capacities were strengthened through the Program. Forest Trends leads this effort and, following the conclusion of the first round of the Program, captured key lessons from its implementation and designed the second round, which has focused on local women leaders. The second round started in July 2021 and will run through February 2022. More details can be found in Section 4.2.

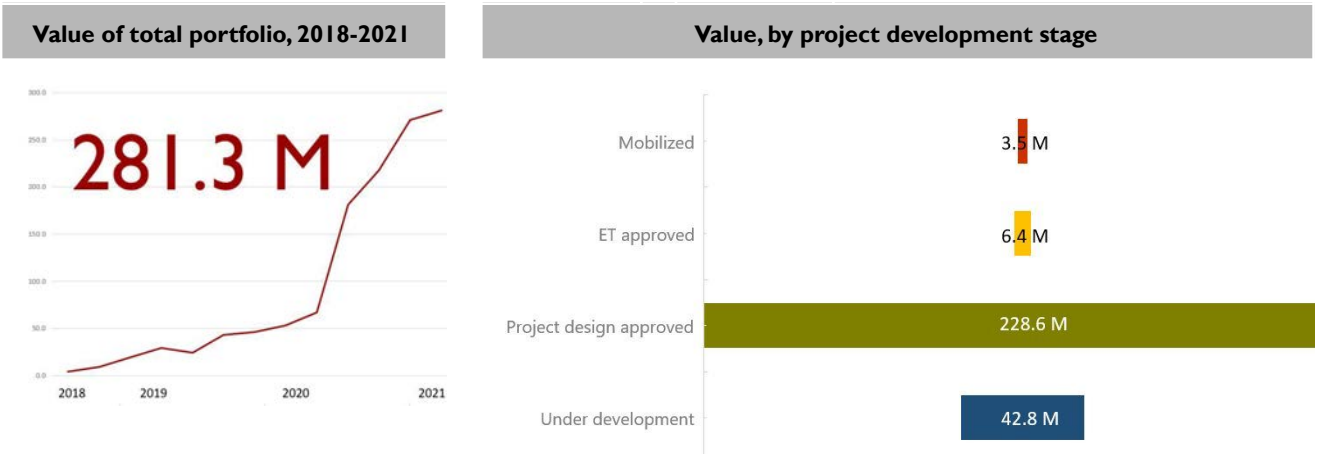
Local women leaders in the Andean Amazonian region of San Martin, receiving training on forest conservation, beekeeping and apiary health management. September 2021 (Photography: Forest Trends)

# Objective 3: Natural Infrastructure Projects are Designed, Financed, and Implemented in Vulnerable Watersheds

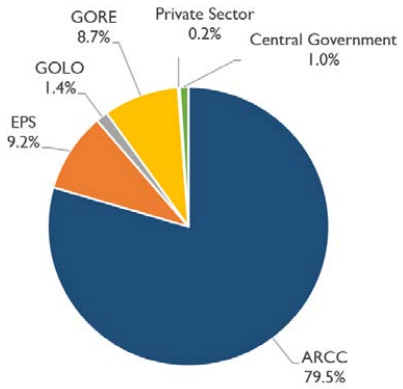
This year NIWS mobilized USD 2.5 million in new public and private investments in natural water infrastructure, an achievement that is encouraging for the entire consortium and our partners, especially given the challenging context of the pandemic and the demand for public funds to respond to the emergency. Additionally, NIWS-supported investments worth over USD 195 M were declared "viable," bringing them to the final stages of project development and approvals.

The total portfolio of natural infrastructure investments developed with NIWS support is now valued at USD 281.3 M (see Figure 3-1). We continue to provide strategic support to our priority clients for the development and mobilization of these investments, as well as capacity building for their management and the development of new investments.

**Figure 3-1. Current status of investments in development with NIWS support (all values in USD)**



| Share of portfolio by value, source of funding | Value by region |
|---|---|





# IR 3.1 Portfolio of Natural Infrastructure Projects Designed

### 3.1.1 Rapid stock-take, needs assessment, and refinement of priority watershed milestones and identification of learning sites with local counterparts.

This activity has been completed; no further efforts will be implemented in FY2021.

### 3.1.2 Design and implement M&E programs in learning site in priority watersheds

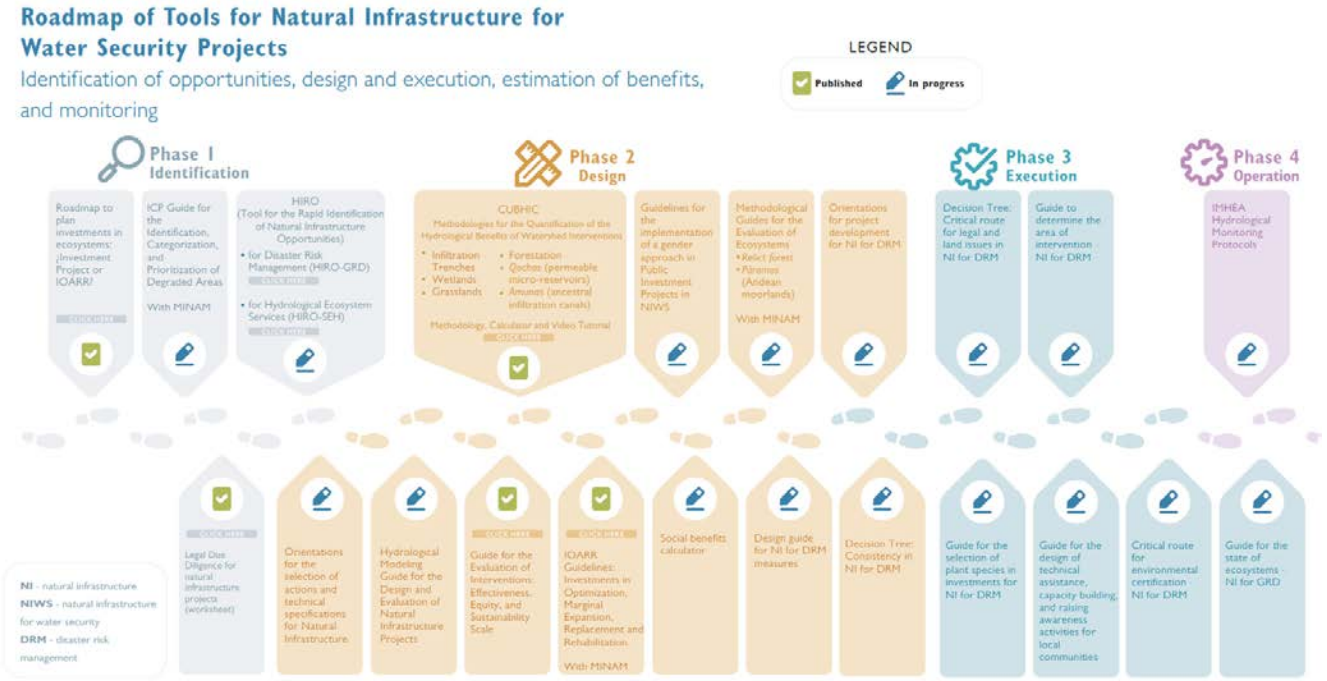
This activity is now being described under Activity 2.1.3 in order to concentrate our discussion of hydrological monitoring activities.

### 3.1.3 Consolidate Project Design Toolbox and deploy broad capacity-building for project designers and evaluators in priority watersheds

**Consolidate, publish and maintain Project Design Toolbox in web-accessible, user- friendly database**

This year, Forest Trends launched the Project Design Toolbox, an online platform that showcases tools and guidance relevant to natural infrastructure for project developers and evaluators in Peru (https://www.forest-trends.org/caja-de-herramientas/), which includes original tools developed by NIWS as well as additional resources created by other institutions. The toolbox is used as reference in our natural infrastructure courses, webinars, and the Community of Practice. So far, NIWS has developed 10 tools available on the toolbox, and more than 16 additional tools are currently being developed and piloted. The tools are shown in Figure 3-2.

**Figure 3-2: Original tools for Natural Infrastructure and Water Security projects, by project development phase**




## Develop and implement community of practice for project designers, including learning sites and other MERESE/NI leaders

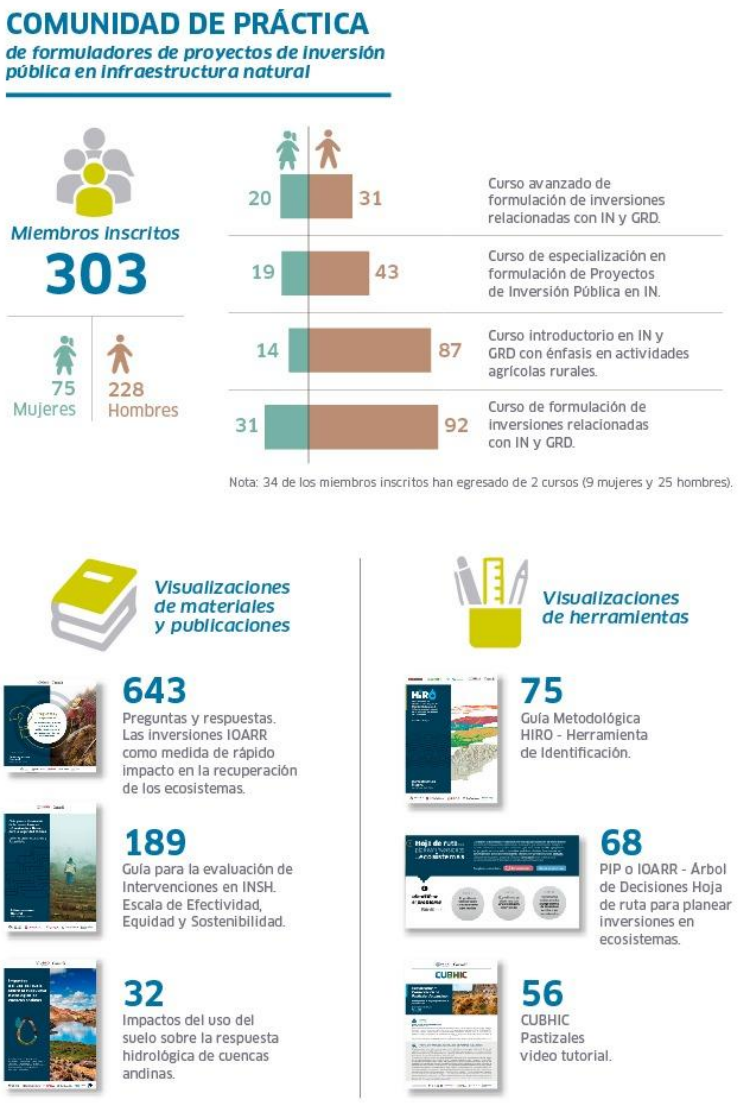
This year, Forest Trends developed and launched the Community of Practice (CoP), a virtual space for online collaboration about natural infrastructure. This initiative arose from a collective need to develop specialized knowledge and shared expertise on this new topic, as well as a demonstrated interest from past participants in NIWS' courses to continue learning about successful case studies. The objective is to make information on natural infrastructure projects easily accessible and facilitate exchange of knowledge among the community. The platform consolidates all the information produced by the project and is accessible to graduates of NIWS courses. The CoP aims to generate momentum for improving the quality and quantity of projects with interventions in natural infrastructure for water security.

The platform went live during Q3. Currently, there are 303 active users (228 men and 75 women). Participation in the community of practice is male-dominated because project formulators are mostly men. To address this, NIWS reactivated a Facebook group with similar content, which is open not only to project formulators, but other professionals who participated in the different courses and has more equal participation (47 women and 53 men). The Facebook group, originally created after the first NIWS training in December 2019, is moderated by the Forest Trends capacity building team. The Facebook group has had more direct participation than the CoP so far, and is an opportunity to engage users towards the CoP. NIWS is also reviewing the capacity-building strategy more broadly to identify additional measures that could be implemented to recruit and retain participation from more women in

project development.

During the COP's first webinar in Q4, the platform was introduced and Imperial College London presented evidence on the benefits of the natural infrastructure for water security. The webinar was attended by 152 people (87 men and 65 women) including 90% Peruvians and 10% foreigners from Bolivia, Brazil, Colombia, Ecuador, the United States, Guatemala and Uruguay. The Q&A session from the webinar has been compiled into a document "Q&A: Natural Infrastructure: What do we know?" which is currently being reviewed for publication on the platform.

**Fig 3-3. Data from the Community of Practice platform (as of Q4)**



**Guide for the Evaluation of Interventions in Natural Infrastructure for Water Security: Effectiveness, Equity and Sustainability (EES) Scale**

On December 2, 2020, Forest Trends launched the Guide for the Evaluation of Interventions in Natural Infrastructure for Water Security: Effectiveness, Equity and Sustainability Scale. The Guide was developed by the NIWS Consortium to support project formulators and evaluators in all stages of project development and management. The objective of the guide is to serve as a practical, comprehensive and innovative tool that allows the measurement and evaluation of interventions in natural infrastructure across three dimensions: effectiveness, equity and sustainability. Each dimension has sub-categories that are evaluated on the following scale: Not considered, Basic, Intermediate, Good and Transformative.

**Develop and Publish a Catalogue of Natural Infrastructure Measures**

Technical specifications are crucial for any construction project—they streamline efficient design and implementation and improve scheduling, costs and final results. This year, Forest Trends and CONDESAN began preparation of the *Catalogue of Natural Infrastructure Measures*, a set of technical specifications for natural infrastructure for water security projects. Forest Trends developed 10 technical specifications for natural infrastructure measures for flood and landslides, which will contribute to the implementation of RCC investments in natural infrastructure. NIWS also hired a team supervised by CONDESAN to finalize the catalogue for ecosystem services for water supply and erosion control—this effort is in the final stages and will conclude next quarter. While this line of work was originally envisioned to be carried out with MINAM, at the beginning of Q2 MINAM informed NIWS that this activity was not a priority for them. Once completed, the catalogue will be shared with MINAM, ARCC, GOREs, SEDAPAL and other counterparts.

**Prepare recommendations on methodologies and models to estimate the green infrastructure gap and to evaluate green infrastructure projects, in terms of relevant Public Investment indicators**

NIWS completed the study "Selection of Appropriate Species for Restoring Ecosystem Services related to Water", producing a species list to be used as new reference material for the design of natural infrastructure projects that involve vegetative cover, like reforestation. The species list is organized by ecosystem services (water regulation or erosion control), altitude/ecosystem, and slope aspect, which involved identifying 13 types of ecosystems of hydrologic importance in Peru, creating a preliminary list of plant species in each ecosystem, and ranking them by criteria (origin, ecosystem services, ecological and socioeconomic, and propagation). The consultant also created a database of nurseries within the NIWS priority watersheds that provide access to plant material for improving water regulation and soil erosion control. This document is being used in the design of actions for the formulation of projects with the GORE and RCC. In the case of RCC, work is also being done on a methodological guide for the selection of species within the framework of the DRM.

### ICP - Identification, Categorization, and Prioritization of Degraded Ecosystems

This quarter, CONDESAN supported the revision and improvement of the Methodological Guide for the Identification, Categorization and Prioritization (ICP) of Degraded Areas, which was coordinated with MINAM. The ICP guide helps users identify areas where interventions in natural infrastructure can be implemented. The technical content, editing, and graphical design work have already been completed; the document is currently being reviewed by MINAM's Editorial Committee.

## 3.1.4 Develop a multi-sector, performance-based framework and baseline for Natural Infrastructure in priority watersheds

### SEDAPAL Monitoring & Evaluation System

This year, a considerable effort was dedicated to the development of a watershed monitoring and evaluation system for SEDAPAL's MERESE portfolio. A consulting team led the work with technical supervision by CONDESAN, ICL, Forest Trends, and SEDAPAL. We have developed a workflow and methodological approach for the design; designed the biophysical and hydrological components; developed an impact assessment for the system; and established monitoring procedures. The final design was presented and reviewed by SEDAPAL. SEDAPAL has committed to following-through to implement the system, although this will likely proceed accompanying each new project as approved, as SEDAPAL's limited team working on its MERESE portfolio has prioritized focusing on priorities of community relations and project mobilization.

### Vilcanota-Urubamba

This year, Forest Trends established a Work Plan with Cusco's water utility (SEDACUSCO) which includes three lines of work in the Piuray-Ccorimarca watershed:

- **Capacity building for SEDACUSCO and the local community,** as beneficiaries and providers of ecosystem services respectively. NIWS developed a case study of the impacts of natural infrastructure interventions in Piuray Ccorimarca, which has been submitted to SEDACUSCO to support the design of natural infrastructure interventions in the watershed.
- **Technical assistance to design a monitoring system for community wellbeing**. NIWS is designing a Social Monitoring System to evaluate the social impacts of SEDACUSCO's activities in Piuray-Ccorimarca. The concept has been defined, and the system will be completed next quarter. This work will improve local awareness of the direct benefits of MERESE to communities, with the aim of improving relations between SEDACUSCO and the communities involved in implementing the MERESE portfolio in the Piuray watershed. It is based on a conceptual framework developed with SEDACUSCO using the Open Standards methodology in the first part of this fiscal year to identify causes of tensions in the relationship between the water utility and local communities.
- **Technical assistance to prepare an Intervention Plan.** A rapid analysis of MERESE-H with SUNASS identified a lack of specific criteria related to water quality, which is necessary to understand ecosystems with dams or reservoirs. In response, NIWS prepared TOR to analyze the relationship between water quality and MERESE-H actions in Piuray. This document will be a

great input for the elaboration of the Intervention Plan. We should be able to implement it during the first half of FY 2022.

Recent changes in SEDACUSCO's staffing, COVID impacts in the region, and changes in the leadership of the Piuray-Ccorimarca Watershed Management Committee have inhibited progress in these lines of work this year; however, we have been coordinating with these actors, as well as the Municipality of Chinchero, SUNASS, and INAIGEM to resume collaboration on these activities next quarter.

**Tambo-Moquegua**

This year, Forest Trends and CONDESAN made progress on institutional arrangements and technical analysis for a scaled portfolio of natural infrastructure investments in the Tambo-Moquegua watershed, while also mobilizing private funds to support targeted piloting and capacity-building activities as catalysts for the portfolio. Forest Trends signed an MOU with the Regional Government of Moquegua and established NIWS as a technical advisor in the emerging Collaborative Regional Development Platform (Section 3.2.4).

The proposed idea to develop 'Strategic Cases' in the Tambo-Moquegua and Quilca Chili watersheds has instead evolved into 'Hydro-Economic Analyses', which better represents the estimation of the hydrological and economic benefits of natural infrastructure portfolios in these watersheds. The objective of these analyses is to promote collaboration between public and private institutions to scale investments in natural infrastructure.

For Tambo-Moquegua, Forest Trends and CONDESAN coordinated with GORE Moquegua's Sub-Division of Natural Resources to present the scope of the analysis to the Regional Environmental Commission (CAR), including its objectives, structure, and approach. Forest Trends, CONDESAN, and Imperial College London have collaborated on the methodological development and preliminary modelling of hydrological benefits, monetized value of benefits, and estimating the costs of interventions; and a presentation of the preliminary portfolio of natural infrastructure projects, with hopes it will be included in the upcoming Regional Development Plan by GORE Moqegua.

**Quilca - Chili**

Forest Trends, CONDESAN, and Imperial College London are also preparing a Hydro-Economic Analysis in Quilca-Chili, which will provide information about natural infrastructure investments that address water issues of concern in Arequipa. This work is being carried out in close coordination with the Quilca-Chili Water Resources Council. Once complete, the analysis will support decision making on natural infrastructure, specifically by providing input for key stakeholders as they update the Watershed Resource Management Plan (PGRHC).

So far, the analysis includes the monetization of hydrological benefits for Arequipa´s Water Utility (SEDAPAR), which helps to make the case for a NI portafolio at the watershed level. The modeling efforts and coordination with counterparts are still ongoing.

### 3.1.5 Leverage local capacity and technical tools to produce a "bottom-up" pipeline of performance-based projects

NIWS has continued to manage a pipeline of natural infrastructure projects that respond to both the

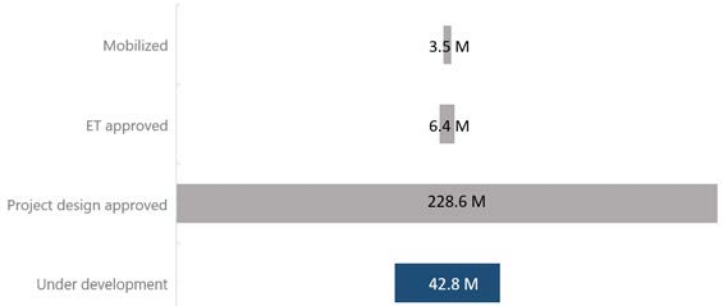
interests of investors and the needs in vulnerable watersheds. NIWS is currently supporting the development of 22 projects in the earliest design stage (pre-"viability"), representing an estimated total of USD 42.8 million (see Table 3-1). Progress for these projects are described in the following sections:

- Section 1.3.4. Project development by RCC
- Section 3.1.5. Project development by SEDAPAL and GORE
- Section 3.2.1. Project development by all other implementation mechanisms (IOARRs, direct contracts, private sector); and all investment mobilization in more mature stages of project development

**Table 3-1. Pipeline of projects under development with NIWS support.**

This table includes projects in the stage of design development, before they are approved in public investment (declared "viable"). Table 3-2 in Section 3.2.1 reports on projects in more mature stages of development.

**Value of investments with NIWS support, by project development stage (USD)**




**Pipeline of projects under development**

| Abbreviated project name | Watershed | Payer | Estimated value (USD) |
|---|---|---|---|
| Virú | Virú | ARCC | 18.5 M |
| Cuenca Tambo | Tambo-Moquegua | GORE Moquegua | 4. M |
| Quilca-Chili Regulada | Quilca-Chili | SEDAPAR | 3.3 M |
| San Juan de Tarucani | Quilca-Chili | SERNANP | 2.8 M |
| Quilca-Chili No Regulada | Quilca-Chili | SEDAPAR | 1.5 M |
| Piura | Chira-Piura | ARCC | 1.5 M |
| El Sauce | Mayo | GORE San Martín | 1.4 M |
| Marca IV | ChiRiLuMa | SEDAPAL | 1.3 M |
| Bosques de Zarate | ChiRiLuMa | SEDAPAL | 1. M |
| Curihuay | ChiRiLuMa | SEDAPAL | 1. M |
| Yamecoto | ChiRiLuMa | SEDAPAL | 0.9 M |
| Huayca | ChiRiLuMa | SEDAPAL | 0.8 M |
| Chancay | Chancay | ARCC | 0.8 M |
| Sangrar | ChiRiLuMa | SEDAPAL | 0.7 M |
| Urcuyacu | Mayo | Proyecto Especial Alto Mayo | 0.7 M |
| Marcacocha | ChiRiLuMa | SEDAPAL | 0.5 M |
| Yantac | ChiRiLuMa | SEDAPAL | 0.5 M |
| IOARR Machu Picchu | Vilcanota-Urubamba | GORE Cusco | 0.5 M |
| Jicamarca | ChiRiLuMa | SEDAPAL | 0.5 M |
| Chaqocha | Vilcanota-Urubamba | EPS SEDACUSCO | 0.3 M |
| Masaypata | ChiRiLuMa | SEDAPAL | 0.3 M |
| Carumas | Tambo-Moquegua | Anglo American | 0.1 M |

**Develop and implement strategy for scaled-up pipeline of projects for implementing SEDAPAL MERESE program**

This year Forest Trends led NIWS' technical assistance to SEDAPAL's MERESE portfolio, which resulted in great achievements: i) the implementation of SEDAPAL's first MERESE project, the USD 0.9 M Milloc Project and ii) the approval and implementation of the San Antonio Project. While the San Antonio Project has a relatively small budget (USD 10,000), it is important because it is the first project to use Contracts for Goods and Services, a new financing mechanism which we hope to scale and replicate in the future as it is much more efficient and agile compared to public investment projects. NIWS technical assistance also resulted in the viability of 7 new public investment projects in SEDAPAL's portfolio, together totalling USD 5.4 M: Pucullo, Huitama, Aycagranga, Ararac, Intercuenca Laraos, Poccrococha and Quipacancha.

Forest Trends provided technical assistance to SEDAPAL for various stages of project development:

- Four detailed project plans (ETs) totaling USD 5.4 million: Curicocha, Cashapampa, Llamacocha and Huamantanga.
- Two project designs totaling USD 1.7 million which have been fully developed and are in final review by SEDAPAL for viability: Yamecoto and Huayca.
- Eight project designs totaling USD 5.8 million in development: Masaypata, Marca IV, Jicamarca, Bosques de Zárate, Yantac, Marcacocha, Curihuay, and Sangrar.

Forest Trends also provided technical assistance for the incorporation of archaeological considerations in the development of investment projects. NIWS completed archaeological evaluations for 14 projects from SEDAPAL's portfolio, and drafted considerations related to archaeology for the ToR for the development of their ETs. Led by SPDA, NIWS also prepared a roadmap and list of recommendations to clarify the administrative procedures required by the Ministry of Culture (MINCUL) for archaeological certifications, which will help keep projects on schedule and minimize extra costs.

PIP Tambo-Moquegua (GORE Moquegua)

In Q1, GORE Moquegua decided to overhaul this project in response to suggestions by NIWS. NIWS, through CONDESAN, developed a new project design with supporting annexes, which will be submitted to GORE Moquegua for approval. NIWS will continue to provide technical assistance and follow-up for the viability process, after which NIWS and GORE Moquegua will define terms for the preparation of the Technical File (ET). The location of the interventions within this project had previously been defined based on field assessments supported by HIRO.

### 3.1.6. Unlock funds for effective, gender-equitable NI investments through targeted support through Incubator

**Implement demand-driven support to unlock effective, gender-equitable NI investments through Incubator**

Capacity Building for Water User Boards

Forest Trends and ANA have been coordinating a program to strengthen water user organizations' role in watershed conservation, approved under the second round of the NIWS Incubator. One of the

initiative's key objectives is to improve water user organizations' understanding of the importance of ecosystems (such as Andean forests and wetlands) and ecosystem services at the watershed level. In Q4, Forest Trends and ANA developed the structure and content for the course with specific considerations for the demands of the water user boards in mind.

The design for the program is currently under review by ANA and NIWS. Once approved, ANA will fund the implementation of the program. In order for the program to be successful, ANA will have to provide training for the facilitators and ensure the program is scheduled with the water user boards in mind.

PIP Huamanga

NIWS, led by CONDESAN with support from Forest Trends, is designing the Expediente Tecnico for PIP Huamanga, an important project that integrates watershed management and a gender perspective. This project was selected for support under the NIWS Incubator after being proposed by MIMP. This process was delayed as the initial bids did not meet quality standards and was relaunched, but is currently underway. The design is being developed and the ET should be completed next quarter. NIWS has secured important funding commitments from GORE Ayacucho for this project, including approximately USD 20,000 of co-financing for the preparation of complementary studies required for the ET, and the allocation of the project budget in the GORE's Multiannual Investment Programming (PMI) for 2022-2024.

A gender approach has been incorporated into the development of the ET for this project, which contains detailed information about the local communities disaggregated by sex. This information will serve as important reference for other investment projects on how to collect primary information on key aspects of gender inequality such as the use of time, ancestral knowledge, expectations for men and women in project activities; secondary information disaggregated by sex; information about the participation of women and men in workshops; and the recognition of the women's domestic workload. The ET also contains a stipulation that women and men should receive equal payment for the reforestation activities.

The information gathered for the ET also identified social considerations like the need for the team responsible for execution of the project to speak Quechua, the native language within the local communities, as well as consider payments for the use of land.

# IR 3.2: Diverse and gender-equitable financial mechanisms and incentives (public and private) for investment in Natural Infrastructure mobilized

### 3.2.1 Assure early implementation of MERESE tariffs through SNIP, Invierte.Pe, and direct contracts (new mechanism)

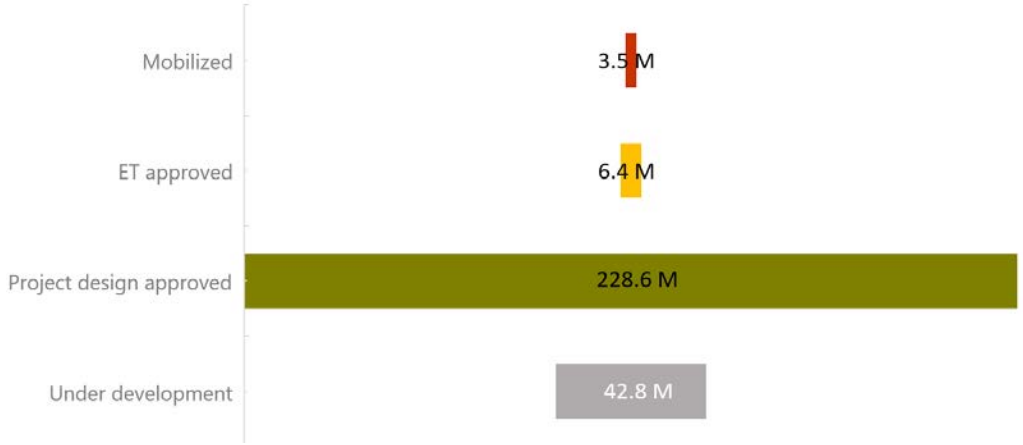
**Provide technical assistance by public investment specialist to address bottlenecks in PIP approvals in priority watersheds**

This year, NIWS provided technical assistance to mobilize over USD 238 million of mature investments (see Table 3-2). These projects have all at least secured payers, completed a full project design, and secured approval (in public investment, "viability") for the full project design. To advance to implementation, they need additional support to ensure they obtain final approvals from their payers and local communities, as well as to develop a detailed work plan (in public investment, "Expediente Técnico") for implementation.

The public investment mobilized this year was the PIP Pusmalca (GORE Piura): The Expediente Técnico was approved in Q3, the project budget was allocated by GORE Piura in Q4. The implementation is currently scheduled to start in 2022. More details after Table 3-3.

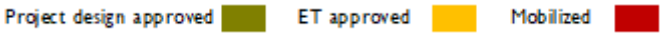
**Table 3-2. Projects receiving direct NIWS technical and financial support to advance towards implementation**

**Value of investments with NIWS support, by project development stage (USD)**




**ET approved (USD)**

| Abbreviated project name | Watershed | Payer | Value (USD) |
|---|---|---|---|
| Chancay-Huaral | Chancay-Huaral | GORE Lima | 5.3 M |
| Pusmalca | Chira-Piura | GORE Piura | 2.1 M |
| Moyobamba | Mayo | EPS Moyobamba | 1.1 M |
| Milloc | ChiRiLuMa | SEDAPAL | 0.9 M |
| Mitsubishi | Tambo-Moquegua | Mitsubishi Foundation | 0.3 M |
| Tumilaca | Tambo-Moquegua | Anglo American | 0.2 M |
| Bienes y Servicios - San Antonio | ChiRiLuMa | SEDAPAL | 0.01 M |




**Project design approved (USD)**

| Abbreviated project name | Watershed | Payer | Value (USD) |
|---|---|---|---|
| Mala | Mala | ARCC | 46.4 M |
| Olmos | Olmos | ARCC | 34. M |
| Casma | Casma | ARCC | 26.1 M |
| Cañete | Cañete | ARCC | 21.9 M |
| Matagente | Matagente - Ica | ARCC | 17.1 M |
| Zaña | Zaña | ARCC | 16.7 M |
| Lacramarca | Lacramarca | ARCC | 16.5 M |
| Chicama | Chicama | ARCC | 13.7 M |
| Huarmey | Huarmey | ARCC | 8.5 M |
| Distrito Carumas | Tambo-Moquegua | Municipalidad Distrital de Carumas | 3.9 M |
| Huamanga | Ayacucho | GORE Ayacucho | 3.8 M |
| Macará-Quiroz | Chira-Piura | GORE Piura | 3.2 M |
| Huamantanga | ChiRiLuMa | SEDAPAL | 3.1 M |
| Tumbes | Tumbes | ARCC | 2.1 M |
| Pichu Pichu | Quilca-Chili | GORE Arequipa | 1.6 M |
| El Faique | Chira-Piura | GORE Piura | 1.2 M |
| Cachiyacu | Mayo | EMAPA San Martín | 1.1 M |
| Poccrococha | ChiRiLuMa | SEDAPAL | 0.9 M |
| Intercuenca Laraos | ChiRiLuMa | SEDAPAL | 0.8 M |
| Huitama | ChiRiLuMa | SEDAPAL | 0.8 M |
| Quipacancha | ChiRiLuMa | SEDAPAL | 0.8 M |
| Aycagranga | ChiRiLuMa | SEDAPAL | 0.8 M |
| Pucullo | ChiRiLuMa | SEDAPAL | 0.7 M |
| Ararac | ChiRiLuMa | SEDAPAL | 0.7 M |
| Curicocha | ChiRiLuMa | SEDAPAL | 0.6 M |
| IOARR Tupicocha | ChiRiLuMa | GORE Lima | 0.6 M |
| Cashapampa | ChiRiLuMa | SEDAPAL | 0.6 M |
| Llamacocha | ChiRiLuMa | SEDAPAL | 0.5 M |

Although COVID-19 restrictions have inhibited some progress in the mobilization of investments this year, 32 of the 57 projects receiving direct NIWS support achieved new milestones. These 32 projects are shown in Table 3-3.

### Table 3-3. Projects receiving direct NIWS support that achieved new milestones in FY2021

| | Abbreviated project name | Payer | Q4-2020 Status | Q4-2021 Status | Total Investment (USD) |
|---|---|---|---|---|---|
| 1 | Ararac | SEDAPAL | Profile or FT in development (or with comments) | Profile or FT declared viable (approved) | 659,500 |
| 2 | Aycagranga | SEDAPAL | Profile or FT in development (or with comments) | Profile or FT declared viable (approved) | 760,000 |
| 3 | Bienes y Servicios - San Antonio | SEDAPAL | - | From: Idea<br>To: ET approved, mobilized | 10,000 |
| 4 | Cachiyacu | EMAPA San Martín | Profile or FT declared viable (approved) | ET developed | 1,122,000 |

| | | | | | |
|---|---|---|---|---|---|
| 5 | Cañete | ARCC | Idea | Profile or FT declared viable (approved) | 21,924,800 |
| 6 | Cashapampa | SEDAPAL | - | From: Profile or FT declared viable (approved)<br>To: ET in development (or with comments) | 576,100 |
| 7 | Casma | ARCC | Idea | Profile or FT declared viable (approved) | 26,091,300 |
| 8 | Chancay-Huaral | GORE Lima | ET developed | ET approved | 5,341,900 |
| 9 | Chicama | ARCC | Idea | Profile or FT declared viable (approved) | 13,713,400 |
| 10 | Curicocha | SEDAPAL | - | From: Profile or FT declared viable (approved)<br>To: ET in development (or with comments) | 611,300 |
| 11 | El Faique | GORE Piura | ET in development (or with comments) | ET approved | 1,227,600 |
| 12 | Huamanga | GORE Ayacucho | Profile or FT declared viable (approved) | ET in development (or with comments) | 3,805,300 |
| 13 | Huamantanga | SEDAPAL | Profile or FT declared viable (approved) | ET in development (or with comments) | 3,137,400 |
| 14 | Huarmey | ARCC | Idea | Profile or FT declared viable (approved) | 8,523,400 |
| 15 | Huitama | SEDAPAL | Profile or FT in development (or with comments) | Profile or FT declared viable (approved) | 785,800 |
| 16 | Intercuenca Laraos | SEDAPAL | Profile or FT developed | Profile or FT declared viable (approved) | 847,200 |
| 17 | IOARR Tupicocha | GORE Lima | Idea | Profile or FT declared viable (approved) | 583,300 |
| 18 | Llamacocha | SEDAPAL | - | From: Profile or FT declared viable (approved)<br>To: ET in development (or with comments) | 471,800 |
| 19 | Macará-Quiroz | GORE Piura | Profile or FT developed | Profile or FT declared viable (approved) | 3,210,400 |
| 20 | Mala | ARCC | Idea | Profile or FT declared viable (approved) | 46,445,400 |
| 21 | Matagente | ARCC | Idea | Profile or FT declared viable (approved) | 17,134,800 |
| 22 | Mitsubishi | Mitsubishi Foundation | ET in development (or with comments) | ET approved, mobilized | 300,000 |
| 23 | Moyobamba | EPS Moyobamba | ET in development (or with comments) | ET approved | 1,077,600 |
| 24 | Olmos | ARCC | Idea | Profile or FT declared viable (approved) | 33,951,400 |
| 25 | Pichu Pichu | GORE Arequipa | ET in development (or with comments) | ET developed | 1,598,600 |
| 26 | Poccrococha | SEDAPAL | Profile or FT declared viable (approved) | Profile or FT declared viable (approved) | 864,900 |
| 27 | Pucullo | SEDAPAL | Profile or FT declared viable (approved) | Profile or FT declared viable (approved) | 665,600 |
| 28 | Pusmalca | GORE Piura | ET developed | ET approved, mobilized | 2,103,200 |
| 29 | Quipacancha | SEDAPAL | Profile or FT declared viable (approved) | Profile or FT declared viable (approved) | 768,800 |
| 30 | Tumbes | ARCC | Idea | Profile or FT declared viable (approved) | 2,079,900 |

| | | | | | |
|---|---|---|---|---|---|
| 31 | Tumilaca | Anglo American | ET in development (or with comments) | ET approved, mobilized | 180,000 |
| 32 | Zaña | ARCC | Idea | Profile or FT declared viable (approved) | 16,650,100 |
| | | | | **Total** | **217,222,800** |

The projects mentioned above include the following interventions in natural infrastructure: reforestation with native species, gully control, exclusion of livestock, construction of terraces, revegetation with native species, construction of infiltration ditches, restoration of platforms, and training and technical assistance to authorities and local residents for the management of ecosystems for disaster risk management.

**Support Mobilization and Implementation of PIPs - Regional Governments**

PIP Pusmalca (GORE Piura)

This year NIWS mobilized USD 2.1 M for reforestation in Pusmalca by GORE Piura, which will restore over 700 hectares of cloud forest, protect a series of headwater springs, and implement surveillance systems to protect critical areas for Piura's water security. The implementation of the project is expected to create over 5,000 day labor jobs for rural communities. This activity is led by CONDESAN.

PIP El Faique (GORE Piura)

Due to quality concerns, NIWS and GORE Piura dismissed the previous consultant in charge of developing the Expediente Técnico for this project and put the contract back out to bid. NIWS hired a new consulting team and after almost six months of work, the preparation of the ET has been completed. Next quarter, we will follow up with GORE Piura to make sure the budget is allocated so that the funds can be mobilized. This activity is led by CONDESAN.


PIP Macara-Quiroz (GORE Piura)

This project, led by CONDESAN, was declared viable in Q3 by GORE Piura with a budget of USD 3.2 M. In July, NIWS hired a consulting team to prepare the Expediente Técnico, which is particularly complex due to the large area. The project covers 1,600 hectares spanning 6 communities, which requires coordination between each of their respective local governments. The ET is already in an advanced stage of development, and it should be completed next quarter.

PIP Pichu Pichu (GORE Arequipa)

This USD 1.6 million project, to be financed by GORE Arequipa, aims to improve the ecosystem service of water regulation in the intervention area, primarily through reforestation with native species and training for local residents. CONDESAN completed a draft of this ET, which was reviewed by the project development unit of the Regional Environmental Authority of GORE Arequipa. CONDESAN has

addressed their comments and submitted the final version to GORE Arequipa supervisors for approval.

PIP Chancay-Huaral (GORE Lima)

Since the approval of the Expediente Técnico at the end of last year, NIWS, through CONDESAN and Forest Trends, has been looking for collaborations with GORE Lima for its budget allocation. Tax breaks for public works (Obras por Impuestos) are being evaluated as a likely option. Building on the Obras por Impuestos strategy developed by Forest Trends this year (see Section 3.2.2), the Chancay-Huaral project was presented to a private company, URBI Intercorp, which has expressed interest in financing the project's implementation through Obras por Impuestos. The ET is currently under review by the company.

**Support Mobilization and Implementation of PIPs - Water Utilities**

PIP Milloc (SEDAPAL)

This USD 0.9 M project was mobilized last year. During FY 2021, the work plans were updated to fit COVID-19 protocols, and the project was officially inaugurated on World Water Day on March 22nd, 2021. SEDAPAL kicked off the project in a ceremony attended by the Minister of Housing, Construction and Sanitation, Solangel Fernández; the Minister of the Environment, Gabriel Quijandría; the Minister of Agrarian Development and Irrigation Pedro Tenorio; the Vice Minister of Construction and Sanitation, Javier Hernández; and the authorities of the Santiago de Carampoma district.

This is the first NIWS supported project that has reached implementation on the ground. Approximately one-third of the project's budget will go to jobs for the local population. The project plans to restore 103 hectares of high Andean wetlands and grasslands, while strengthening sustainable practices in the local economy and protecting wetlands from illegal extraction.

Preparation of ToR for ET (various - SEDAPAL)

Forest Trends designed seven ToR for the development of Expedientes Técnicos which have been approved by SEDAPAL: five projects described in Section 3.1.5. (Aycagranga, Poccrococha, Quipacancha, Huitama, Yamecoto), as well as two projects declared viable (Ararac and Pucullo). NIWS also supported SEDAPAL in responding to questions made by applicants bidding for the preparation of Expedientes Técnicos for several projects. For these projects, SEDAPAL will itself lead the contracting and financing of this final stage of project mobilization, with NIWS' technical assistance and accompaniment.

PIP Moyobamba (EPS Moyobamba)

The Expediente Tecnico for this project was approved in Q2. NIWS supported the EPS Moyobamba in finalizing the ET, obtaining the Certificate of Absence of Archaeological Remains (CIRA) required for its approval, and accompanying efforts to obtain co-financing by drafting a letter requesting MINAM to supplement the 800 thousand soles (USD 0.2 M) the EPS has collected through tariffs—which has since been denied. Instead, NIWS is now promoting a co-execution agreement between EPS Moyobamba and the Municipality of Moyobamba to allocate this budget in order to ensure its implementation.

PIP Cachiyacu (EMAPA San Martín)

The elaboration of the Cachiyacu Expediente Técnico resumed this year, after delays due to the poor quality of work by the previous consultant and COVID-19 cases impacting several local counterparts. CONDESAN has completed and submitted the ET to EMAPA San Martín for evaluation and approval. Unfortunately, due to the pandemic the state allowed the EPS to invest its MERESE funds in other activities to increase public spending and reactivate the local economy, so NIWS and the EPS are looking for allies to fund the project.

**Develop guidance on public investment in natural infrastructure through "investments of optimization, marginal expansion, relocation and rehabilitation" (IOARR)**

IOARRs are public investments that aim to optimize, amplify, restore or rehabilitate existing infrastructure. Because an IOARR does not build new infrastructure, the design and justification required for the investment is marginal compared to a traditional public investment project, which is by far the dominant vehicle for mobilizing investment in natural infrastructure in Peru.

Initially, the IOARR guidelines did not apply to natural infrastructure. NIWS helped MINAM include natural infrastructure in the IOARR guidelines, which were approved by a Ministerial Resolution in December 2019. They help streamline investments for the protection and restoration of natural infrastructure. To test the usefulness of these guidelines, and set an example for scaling them, NIWS has designed two IOARRs for natural water infrastructure, together with key partners. This year, NIWS developed these pilot applications, bringing the projects from idea to complete ET within just one year —unprecedented speed compared to public investment projects.

IOARR Machu Picchu

At the beginning of this year, NIWS, through CONDESAN, hired a consulting team to develop pre-investment studies and an Expediente Técnico for this project (*Rehabilitation of Ecosystems affected by forest fires in the Historic Sanctuary of Machu Picchu*). NIWS also supported the signing of the tripartite agreement with SERNANP and GORE Cusco, which registered GORE Cusco as the project owner and secured the project's budget in GORE Cusco's PMI. The ET has been completed and submitted to GORE Cusco's Natural Resources and Environment Department for approval.

IOARR Tupicocha

At the beginning of this year, NIWS hired a consulting team supervised by CONDESAN to develop pre-investment studies and an Expediente Técnico for this project (*Repair of water infrastructure in amuna; construction of gully control works in the wet puna grassland ecosystem and Andean scrubland in the district of San Andrés de Tupicocha, province of Huarochirí, department of Lima*). This area was selected because it complements another NIWS initiative to implement a monitoring system in the same area. The pre-investment study has been completed and was deemed viable by GORE Lima. The ET has been completed and submitted to GORE Lima for review. The project development team is currently following up with the community regarding their internal sustainability policies, and coordinating with the Municipal District of Tupicocha for the final presentation of the ET.

**Support development and implementation of pilot MERESE through direct contracts**

NIWS and SEDAPAL have been exploring the following alternative mechanisms to accelerate the execution of SEDAPAL's MERESE funds: i) contracts for goods and services, ii) results-based contracts for ecosystem service compensation, and iii) the transfer of funds to a third party (see next subheading). The contract modalities discussed below will improve the execution of SEDAPAL's MERESE fund, while also giving back to communities for carrying out activities related to the conservation, recovery and sustainable use of important ecosystems for water security in their territories. This activity is led by Forest Trends with significant contributions from SPDA.

Contracts for Goods and Services

The contracts for goods and services mechanism was specifically designed for the Operation and Maintenance of existing assets that belong to a community, but are financed by the water utility. This is one of the most direct routes to use the MERESE budget, advance the MERESE program objectives, and potentially to generate benefits for local communities. This year, NIWS supported SEDAPAL to design and implement the first contract for goods and services under their MERESE program. The contract was for the maintenance of a nursery in the rural community of San Antonio, which executed approximately USD 10,000 through a private contractor who worked with local community members to provide labor for the project. This contract represents an important milestone of implementing a new mechanism which is scarcely used by water utilities in their MERESE programs and had never been used by SEDAPAL.

NIWS also completed five additional goods and service proposals under SEDAPAL's MERESE program. These have been developed considering SEDAPAL's priorities for natural infrastructure and will follow its procedures for reviews, approvals, and implementation.

Performance-Based Contracts

This year, NIWS explored the possibilities and identified key barriers for the use of performance-based contracts in the MERESE context. Performance-based contracts would offer a key alternative to currently-used implementation mechanisms for MERESE funds—namely Public Investment Projects and contracts for goods and services—by compensating landowners directly for the maintenance of critical natural infrastructure, as opposed to the input activities or practices expected to result in desired outcomes. The results-based payment helps to ensure incentives are aligned between upstream landowners and downstream payers and offers a positive incentive for ensuring compliance over time. It can also directly compensate opportunity costs associated with maintaining natural infrastructure, whereas practice-based contracts and investments can only really reach local communities through payments for services (e.g., labor) or investments in capacity-building and alternative production, which may not bring immediate, tangible benefits – even as changes in practices to avoid undesired land use might bring immediate, tangible impacts to the community.

Despite all these benefits of performance-based contracts, there is no easy or obvious path for using them in the Peruvian MERESE context. In Q1, NIWS contracted a consortium led by Bespoke Mitigation Partners, a firm with significant experience in performance-based contracting in the US context, who partnered with Peruvian and other regional experts. With the supervision and contributions of Forest Trends, SDPA, and CONDESAN, Bespoke led the development of a model performance-based contract that could achieve desired results as designed in the Huamantanga PIP, in SEDAPAL's MERESE portfolio.

Once a more detailed legal-regulatory analysis was carried out, however, it was assessed that this path would be unviable in the current environment, because of several factors that inhibit the direct contracting of upstream communities, as well as the establishment of contract terms over a long enough period of time to be relevant for achieving observable results, among other factors.

NIWS analysis subsequent to this effort also identified the lack of a clear, practical methodology for quantifying opportunity costs associated with natural infrastructure investments as a critical bottleneck to adequately designing potential performance-based contracts.

Upon further review in the context of NIWS' FY2022 Annual Planning, our team concluded that it may be possible to find a short-term workaround many of the barriers originally identified to performance-based contracts. In fact, many of these barriers are already being addressed in the work Forest Trends has been leading with SEDAPAL to execute MERESE funds through goods and services contracts agreed directly with upstream communities. Therefore, we have included in our FY2022 Work Plan additional efforts to design a short-term pilot of a performance-based contract that could work in the current regulatory framework while also developing the necessary analysis and regulatory proposals to support a legal change that would allow for performance-based payments in the MERESE context. These efforts will build directly upon the analysis and model designs prepared by Bespoke and the range of NIWS partners in FY2021.

**Mobilize investment for natural infrastructure through public trust fund**

During the first part of FY2021, NIWS, led by SPDA with contributions from Forest Trends, completed a legal analysis for the transfer of MERESE funds from SEDAPAL to the Peruvian Fund for the Promotion of Natural Protected Areas (PROFONANPE) for administration and implementation. SPDA also evaluated the possibility of implementing a more flexible financing arrangement for PROFONANPE for public projects that manage and remediate environmental liabilities. This analysis found that the more flexible path is indeed viable for MERESE funds, should PROFONANPE and SEDAPAL choose to pursue it. While the process is complex for a number of institutional and political reasons, the viability of this pathway for MERESE funds to be managed outside of the bureaucracy and restrictions of Invierte.pe is an enormous advance, offering an important opportunity for SEDAPAL and all actors involved in its MERESE program.

We are exploring these potential pathways in collaboration with the USAID-FAST project, which is providing technical assistance to improve public financial management of payments for ecosystem services funds. In Q2, NIWS provided input to the project's work plan to evaluate options for more efficiently administering and implementing SEDAPAL's MERESE funds.

<u>Other alternatives for MERESE implementation through a third party</u>

NIWS explored several options for direct contacts. NIWS worked with SEDAPAL to sign a direct contract with GORE Lima to invest USD 700,000 in the maintenance of natural infrastructure in the headwaters of the ChiRiLuMa watershed. However, this process was suspended due to regulatory barriers related to the transfer of funds between public entities in accordance with the SUNASS MRSE Directive.

NIWS also explored a direct contract between SEDAPAL and the Municipality District of Lahuaytambo for the co-financing of a dam expansion and related natural infrastructure interventions (Project:

*Improvement and expansion of the irrigation water service in the Apu Pellojoto sector in the Pariapongo Community, Lahuaytambo district, Huarochirí, Lima)*. NIWS has made progress in the coordination between the municipality and SEDAPAL, as well as presenting a technical report to EGASE to support an agreement between the two entities. We hope to secure an agreement during FY2022. In addition, direct contracting with communities is also being explored. NIWS consulted with the Supervisory Agency for State Contracts (OSCE) to prepare and submit a technical report on this alternative—we are currently waiting for SEDAPAL's response.

### 3.2.2 Develop and operationalize new mechanisms for channeling Natural Infrastructure funds (e.g. private sector, ProInversion) and coordination across sectors (e.g. trusts)

#### Develop business case and mobilize private sector funds for natural infrastructure investment

This year, Forest Trends secured a USD 300,000 grant from the Mitsubishi Foundation of the Americas to invest in a community-based restoration project in Moquegua, aligned with NIWS objectives. The new project, *Building the Blueprint and Capacity for a Scaled, Community-Based Restoration Economy in Moquegua, Peru*, will run for 3 years (January 2021 – December 2023), and will be implemented in coordination with Forest Trends' partners under NIWS, including the Regional Government of Moquegua and Anglo American Quellaveco. The new project will complement NIWS activities with these partners by investing in pilot projects at the local level that will result in:

1. Blueprint for inclusive, sustainable restoration of priority ecosystems, validated in local conditions and with regional government for implementation at scale
2. Capacities built in over 50 local community members to participate in and benefit from the restoration economy, including nursery operations and sustainable NI-linked value chains (e.g., medicinal plants)
3. Over 50 local community members benefit economically from the restoration economy
4. Plant nursery installed, with capacity to restore 30 ha/year
5. Innovative public-private development model captured and shared in key fora

These capacities and blueprint will serve to accelerate and sustain implementation of over $10M in public investment in NI restoration that NIWS is helping to develop and mobilize throughout the watershed. This grant contributes to funds mobilized under the Project.

Additionally, this year NIWS mobilized private investment in the Tumilaca pilot project, funded by Anglo American Quellaveco, also in Moquegua. This pilot, which was fully redesigned in FY2020 with NIWS support, is mobilized and about to begin implementation. Anglo American Quellaveco pened the call for bids for its execution in Q3 and selected a provider in Q4. The execution will start next quarter. The approved USD 180,000 budget will be used to implement a nursery and reforest 20 hectares with native species.

#### Mobilize funds for natural infrastructure through Reconstrucción Con Cambios

This year, 10 project designs for natural infrastructure investments in Reconstrucción Con Cambios (RCC) portfolio were declared "viable," representing almost USD 186 M of investments in 10 of RCC's 17 priority watersheds (for details, see Section 1.3.4). Four more project designs developed with NIWS' support are being evaluated by MIDAGRI for similar approvals, and two more are in development and

will be evaluated by RCC. Additionally, NIWS, led by Forest Trends, is providing technical assistance to ARCC to support the inclusion of natural infrastructure as part of primarily gray infrastructure riparian defense systems. NIWS support for RCC is primarily based on courses, specialized studies, and the use of NIWS tools for project development.

Last quarter, Forest Trends began meeting weekly with the UK Delivery Team and ARCC as part of efforts to develop a set of methodologies and quality control standards that will be included in the Terms of Reference for contracting consultants to develop Definitive Studies (the RCC equivalent of *Expediente Tecnicos*) for the investments. NIWS is leading the development and pilots of these methodologies—including:

- Guidance for designing technical assistance, training and raising awareness activities for natural infrastructure projects with a gender approach;
- Guidance for defining specific locations and interventions based on fieldwork and local consultations;
- A plan to meet the demand for plant species needed for reforestation and revegetation efforts, in order to implement scaled investments in natural infrastructure across all RCC watersheds.

These efforts will continue next quarter.

NIWS also supported the procurement process for the selection of consulting firms to develop Definitive Studies in the Zaña and Tumbes watersheds. The first call for consulting firms was cancelled out due to a lack of qualified applicants, despite the international call for proposals. Forest Trends is therefore working with ARCC, the UK Delivery Team, and partners to cultivate more interest from international consulting firms that would be eligible to apply for the opportunity, and to connect them with Peruvian firms with experience in natural infrastructure.

**Support the execution of NI projects through tax breaks for public works (OxI)**

In FY2021, Forest Trends developed a strategy for mobilizing investments in natural infrastructure through Peru's innovative tax breaks for public works program, *Obras por Impuestos*. Obras por Impuestos allows private companies to execute public investments in exchange for reduced taxes. It is a relatively new mechanism that has not yet been used for any natural infrastructure project. Forest Trends led an assessment of the opportunities and success factors for utilizing this mechanism and began a collaboration with MINAM to identify portfolios with projects that could be promoted for the OxI mechanisms. Forest Trends also began to cultivate a partnership with Intercorp, one of the largest corporations in Peru, to mobilize natural infrastructure investments through Obras por Impuestos.

In FY2022 we will follow-through on the opportunities identified in FY2021, first focusing on the Chancay-Huaral PIP developed with the regional government of Lima and the watershed council of Chancay-Huaral through the NIWS Incubator. NIWS is also exploring this avenue for mobilizing several viable PIPs in SEDAPAL's MERESE portfolio – an opportunity that is more complicated institutionally as it requires the approval of SUNASS and the Ministry of Housing, Construction and Sanitation (MVCS).

### 3.2.3 Engage and mobilize lenders and financial investors to provide pre-investment capital for natural infrastructure project design.

**Pilot cross-sector partnerships to cover pre-investment finance needs**

NIWS is supporting the development of PIP Carumas in Moquegua. The Municipality District of Carumas initially requested support for executing the project, however, upon finding out that MD Carumas did not have sufficient funds for the project, Forest Trends encouraged them to hand over the execution to GORE Moquegua which has a better chance of securing financing. Both parties accepted and initiated the corresponding transfer. Forest Trends also secured a commitment from Anglo American to co-finance the pre-investment studies for the project. These commitments from Anglo American and GORE Moquegua will be formalized in an agreement in FY2022.

### 3.2.4 Design and facilitate implementation of financing mechanisms, governance platforms, and coordination bodies addressing key gaps

**Moquegua Collaborative Regional Development Platform**

Forest Trends also continued to represent NIWS as a technical advisor in Moquegua's emerging Collaborative Regional Development Platform, which aims to leverage public and private efforts to support transformational efforts to build a sustainable development trajectory for the region. NIWS presented its work in Moquegua to the group, which includes GORE Moquegua, Anglo American, Mitsubishi Corporation, and the IFC. SERFOR, MINAM, ENGIE (an energy company), and Board of Engineers have also participated in the Platform's emerging natural infrastructure working group. Forest Trends has encouraged the representation of women in the platform and is supporting the identification of female representatives. Forest Trends has also contributed ideas and feedback to the development of the Platform's foundational materials and graphic identity, ahead of its formal launch scheduled for November 2021.

**SEDAPAL Community Relations**

The success of the SEDAPAL's Environmental Management and Ecosystem Services Management department (EGASE) requires institutional agreements between upstream communities, providers, and local governments, as well as platforms for coordination like the working groups and watershed basin councils in ChiRiLu and Alto Mantaro.

NIWS, through Forest Trends, has completed the preliminary version of a community relations strategy for SEDAPAL and SEDACUSCO's MERESE projects, including community relations plans for nine projects in four communities. Information for the strategies was gathered through meetings with various key actors, such as NGOs, EGASE officials and communities themselves. A consultant has been hired to validate the strategy in the field. We hope to have the strategy reviewed and approved by EGASE during FY2022.

As part of this effort, Forest Trends also prepared the *Introductory Guide to Community Relations in MERESE Projects* and a Monitoring and Evaluation Plan regarding community perceptions within the priority areas for SEDAPAL's MERESE program.

**MERESE Good Governance Platforms**

As part of efforts to improve SEDAPAL's internal coordination for MERESE implementation, NIWS began providing technical support to EGASE for the sustainability of the Good Governance Platforms of ChiRiLu (GT INCA) and Alto Mantaro. The Good Governance Platforms are spaces in which SEDAPAL reports on its investments in natural infrastructure, thereby strengthening its role as a promoter of MERESE, generating confidence in the taxpayer contribution model, and creating an environment conducive to improving the execution of these projects through new modalities. This activity is led by Forest Trends.

During FY2021, NIWS provided technical assistance to SEDAPAL regarding its involvement in these platforms. NIWS mapped the actors involved in SEDAPAL's 2021 MERESE projects, identified key coordination issues between them, and identified natural infrastructure interventions that are important for integral water resource management. The strategy identifies priorities to develop comprehensive projects with productive and sustainable activities; address the lack of knowledge about MERESE and the Good Governance Platform within the communities; and provide training for communities in the field, not just their representatives. This process will help make the MERESE projects visible to the communities and local governments, and thereby increase the confidence and credibility needed to sign the MERESE agreements.

### 3.2.5. Develop, seed, grow, and capture NI Business Models, linking productive economic activities with NI financing

This year, NIWS began implementing efforts to strengthen value chains associated with natural water infrastructure in the Mayo watershed (San Martin region), and NIWS scoped efforts that will begin in FY2022 to support value chains in ChiRiLuMa watersheds (Lima region), Arequipa, and Piura. All efforts are being coordinated to complement select investments in the NIWS portfolio.

In the Mayo basin, support for conservation-compatible supply chains focused on beekeeping associated with forest conservation. To begin, Forest Trends and a local consultant led an assessment of the impact of COVID-19 on beekeeping and the current state of technical capacities in beekeeping organizations was completed. An analysis of the role of women in beekeeping organizations was carried out in Q3, and in Q4 the team designed and started to implement a training plan that responds to the required technical capacities. This scope of work aims to strengthen the capacities of local beekeeper associations associated with the Moyobamba MERESE efforts while articulating these efforts with GORE San Martín's investments and the actions of the National Beekeeping Board and Mayo Sub-basin Committee.

In the ChiRiLuMa watershed, Forest Trends led a prioritization of value chains in SEDAPAL's MERESE communities which has resulted in the prioritization of dairy value chains in the communities of Huaros, Huacos, Carampoma and Laraos; guinea pig value chains in San Antonio, Parac and Yuracmayo; and high Andean crops value chains in San Juan de Iris and San Pedro de Casta. Up to 10 communities have been prioritized to work with, and the vision of conservation of key natural infrastructure to secure water will be incorporated into a value chain intervention. This will convey to the communities the link between the economic activities they usually carry out and the role of ecosystem protectors that the communities play in the MERESE projects. Technical assistance will begin in FY2022.

# IR 3.3: Improvement of the evidence base of the hydrological and socioeconomic impacts of green infrastructure interventions

### 3.3.2 Document learning site and produce and ex ante hydro-economic analyses

This year, Forest Trends started developing a methodology for estimating the number of jobs (day-wages) that will be generated by SEDAPAL's MERESE projects, specifically for the PIPs that already have a project design (FT). The estimation will be based on the number of hours of work per person for each of the the activities proposed in the projects, cross-checking these results across the projects, and comparing them to similar activities in other initiatives. The estimation of the number of jobs created in the communities will improve the data on the benefits of the MERESE projects and strengthen the economic analysis of their design and execution. This estimation will apply equally to all natural infrastructure PIPs in our portfolio. This task will be finished next quarter.

NIWS, led by Forest Trends, conducted a field visit to the Carampoma community, in order to obtain firsthand data on the indirect local benefits of the Milloc Project. NIWS is also conducting a review of PIPs to estimate local hydro-socio-economic benefits such as economic income, land management, and governance.

Inaugural ceremony celebrating the start of implementation of SEDAPAL's first MERESE Project, the Milloc Project in Carampoma, March 2021 (Photography: Forest Trends)

# Cross-Cutting Strategies and Project Administration

## 4.1: Monitoring, Evaluation and Learning

### 4.1.1 Monitoring Evaluation and Learning Plan

**Updated Monitoring, Evaluation and Learning Plan**

This year, Forest Trends updated the project's Monitoring, Evaluation, and Learning Plan. All changes were coordinated with USAID and presented to the rest of the NIWS team. They include:

- Establishing a new indicator to track improved performance of NIWS partner institutions. (EST-9: Percent of USG-assisted organizations with improved performance, corresponding to USAID's standard capacity building indicator CBLD-9),
- Establishing a new custom indicator to track advancement of investments among intermediate stages of development, before "final" mobilization (PROP-1: Investment according to the stage of the project formulation process in the reporting period)
- Changing from collecting sex-disaggregated data (male, female) to focusing on gender (man, woman, non-binary, and other) for project indicators.

In Q1, Forest Trends held an orientation on the current Monitoring and Evaluation Plan for new employees. The orientation outlined the results, activities and sub-activities, indicators and their definitions, means of verification, as well as the role, function and requirements of each new professional in these areas.

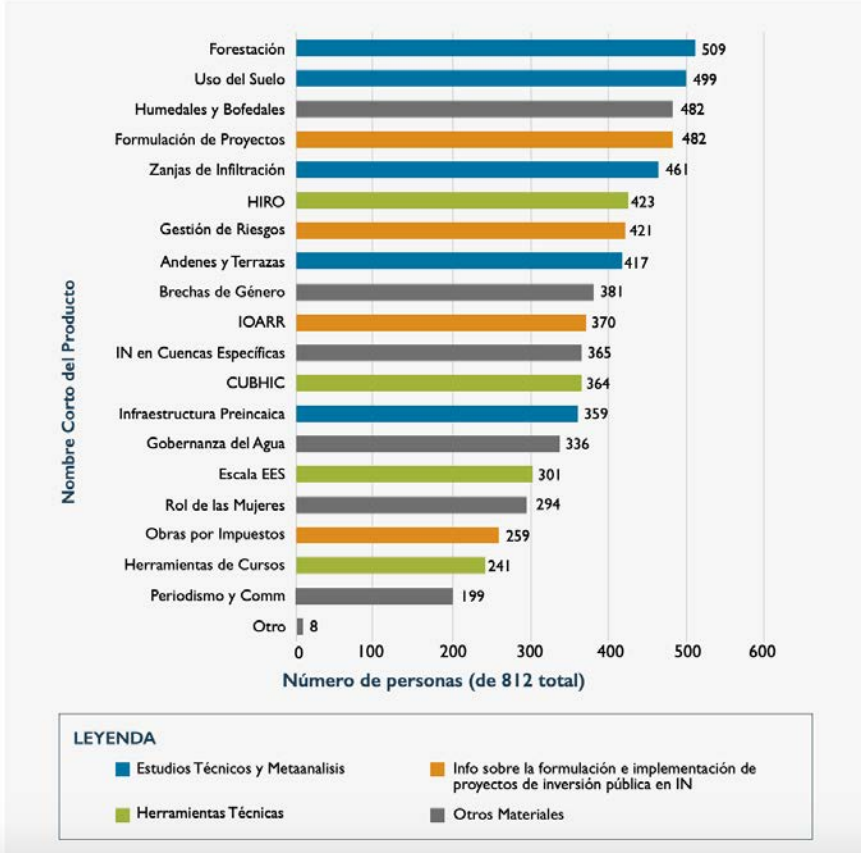
In Q4, Forest Trends worked with our Consortium partners to define our strategy for demonstrating improvements to institutional performance in accordance with our new indicator to measure improvements in organizations, CBLD-9. This strategy builds on many efforts already underway with NIWS counterparts that have resulted in improvements to institutional capacities and that will continue to do so; now, to meet the standards set in this indicator, these processes need to be formalized, documented, and managed. To start, NIWS has selected 6 entities for this work: SEDAPAL, SUNASS, ANA, and the Regional Governments of Arequipa, Moquegua, and Piura. NIWS has held one workshop with each of the aforementioned Regional Governments to gather information to: i) establish a roadmap for short term collaboration with the investment teams, ii) identify key aspects for investment management, iii) differentiate aspects related to management and technical areas, and iv) define key actors within each regional government.

In the final part of FY2021, at USAID's request, the NIWS monitoring and evaluation team conducted a Data Quality Assessment of all project indicators. The analysis evaluated the validity, reliability and integrity of the entire data management process including registration, monitoring and follow-up. The results of this analysis will help to improve the process, both in terms of data processing and the monitoring and evaluation plan.

## Use of Information Study

During March and April, Forest Trends conducted a virtual survey on the use of information disseminated by the NIWS project. The survey was sent out to people who participated in past NIWS events, including courses, workshops, webinars, and forums. The results have been documented in a report for internal purposes. In total, the survey received 813 responses (488 men, 324 women, 1 unreported). 99% of those surveyed reported at least one NIWS knowledge product was useful, and 85% reported having already used the information (e.g. for technical studies and research; capacity building and technical assistance; internal or external institutional communication; policy; public outreach; and/or project development). Although the survey results were anonymous, the report breaks down the results by type of institution (public, academic, private, or NGO). The survey also collected information about preferences for future information. The results helped inform project indicator *EST-2: Number of people using climate information or implementing risk-reducing actions to improve resilience to climate change as supported by USG assistance (EG.11-6)*, and will also help improve NIWS' strategies for generating and sharing information for decision-making.

**Figure 4-1. Number of people who reported NIWS documents as useful from the Use of Information Study**




## Report on the estimation of hydrological benefits of investment projects

While the primary objective of the NIWS project is to improve water security through natural infrastructure, the indicators to measure this impact have not yet been established in Peru. Therefore, CONDESAN is in the process of developing indicators to measure the impact of natural infrastructure

interventions and standardize the estimation of the hydrological benefits they provide. During the latter part of FY2021, Forest Trends compiled this information into a report, which summarizes the estimates for the NIWS project portfolio, as well as the calculations and methods used. The report can be found in the Annexes.

**Studies on perceptions on natural infrastructure— in communities and through the media**

Forest Trends also carried out two studies to understand the impact of NIWS on the perceptions of key audiences around natural infrastructure and water security—one study focused on community perceptions, while the other focused on the number of times natural infrastructure appeared in the media. The study on communities was carried out in 3 locations, and aims to provide an understanding about their conception of natural infrastructure and its benefits, their sources of information on the subject, and the types of interventions they prioritize. Since these communities are within areas influenced by NIWS interventions, the report will serve to identify changes in the communities' perception of natural infrastructure based on NIWS activities. The report could also be used as reference for natural infrastructure project designers from both the public and private sectors, as it highlights community perceptions and their willingness to participate and learn about these issues.

The study on the media aims to provide an understanding of the dissemination and impact of information about natural infrastructure shared by key NIWS partners and the Peruvian press. Previous versions of this study have already been carried out in 2019 and 2020, which identified the number of times these topics were mentioned by selected media channels or key partners' social media platforms during the first, second and third years of the project (2018, 2019, 2020). The results of this year's study have shown the appearance of natural infrastructure for water security and related topics has been progressively increasing, both in the press and on key partners' social media.

The consultancy for these studies was completed in Q4. Forest Trends provided comments on the final reports which the consultant has already incorporated; graphic design and publication will take place next quarter.

**Report on number of economic beneficiaries of natural infrastructure interventions**

As part of the estimation of the benefits of investments in natural infrastructure, Forest Trends has calculated the number of beneficiaries of mobilized natural infrastructure investments. The estimates were based on the projected number of jobs (day wages) generated, as well as the number of people with possible economic benefits as a result of the interventions in natural infrastructure. The summary report is included in the Annexes.

**Project Information System**

The Project Information System manages data for the project indicators to support quarterly and annual reporting, including information about NIWS events, participants, policies, laws and regulations, generated by the project, natural infrastructure investments, and their respective means of verification. The system is continuously updated, providing quality information for decision-making, developing reports, and communication products. This year, Forest Trends created new modules within the system to manage data for the two new project indicators (EST-9 and PROP- 1). In Q1, NIWS trained new

members on its use, importance and functionalities, especially in relation to the registration of events and participants, investment monitoring, and policies, laws and regulations.

**Development Information System**

In Q4, FY2020 project data was registered in the Development Information System (DIS) according to guidance from USAID's monitoring team.

**APCI**

In Q2, Forest Trends and our Peruvian partners submitted annual reporting on the programming and execution of the NIWS project to the Peruvian Agency for International Cooperation (APCI). The reporting complies with APCI's requirements including technical information, administrative information, and progress towards project goals, results, indicators and the budget execution.

**Preparation for Mid Term Evaluation**

Forest Trends participated in a series of meetings convened by USAID to contribute to the Terms of Reference for NIWS' mid-term evaluation, which is slated to begin soon. Forest Trends and the consortium partners have prepared reference information for the evaluators.

**Publication: Achievements to Date of the NIWS Project**

As part of the (approximate) mid-term reflections of the NIWS Project, Forest Trends led the preparation of a publication that summarizes NIWS' main achievements. The publication, *Journey toward Water Security: Achievements to Date of the NIWS Project*, was prepared in the second part of the fiscal year and launched in October 2021.

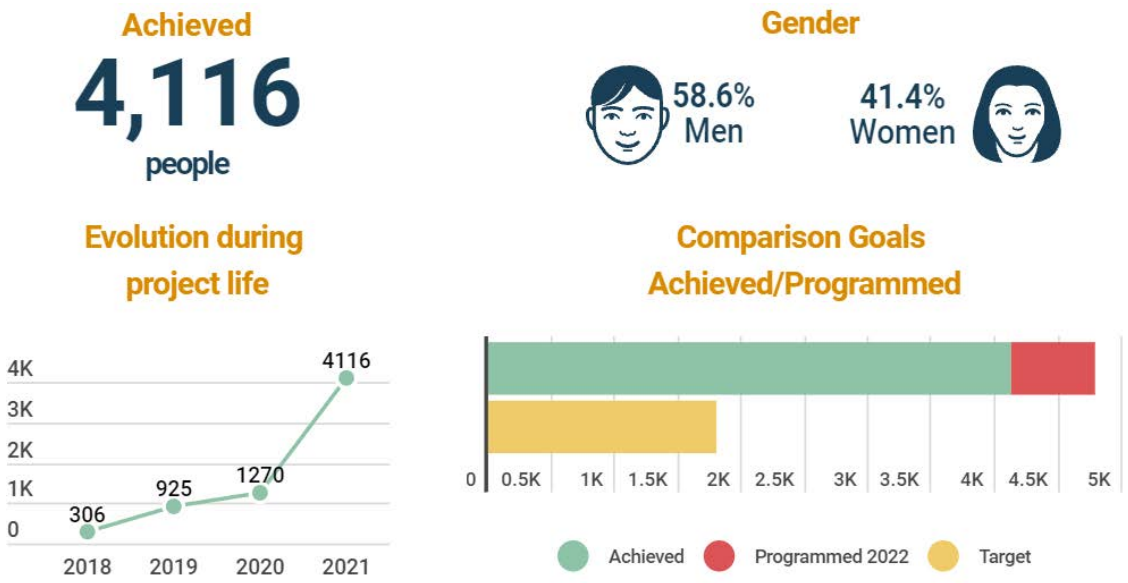
### 4.1.2 Capacity-Building Strategy and Action Plan

This year, NIWS implemented five virtual courses as part of the capacity building strategy:

- an introductory course on natural infrastructure and disaster risk management for AgroRural staff;
- a course for natural infrastructure project developers and evaluators in the framework of Reconstruccion Con Cambios;
- an advanced course on natural infrastructure investments offered in partnership with the University of Technology and Engineering (UTEC);
- a training on natural infrastructure for journalists; and
- a Massive Open Online Course (MOOC) on Sustainable Water Management with ENAP and SUNASS (ongoing)

Together, these courses strengthened capacities for a total of 2,846 people (41% women and 59% men), doubling the annual target, as shown in the following figure. These achievements were possible as a result of collaborations with universities and state entities, as described below.

**Figure 4-2. Number of people with strengthened capacities through NIWS events, cumulative over project life**




With the exception of the MOOC, all of these courses were taught on the NIWS Virtual Classroom (https://aulainfraestructuranatural.org), a platform that has grown exponentially since its implementation just over a year ago. This year, NIWS updated the version of the Moodle platform used by the Natural Infrastructure Virtual Classroom, and updated a new format for the NI Virtual Classroom which improves the display of content across a variety of devices (i.e., laptops, tablets, and smartphones) and the organization of information. These changes considerably improve the user experience of the NI courses. Other improvements include the use of Padlet, which is a virtual environment that enables the creation of online content in a collaborative way to share images, videos, audios and text.

**Courses developed/in development**

Introductory course on natural infrastructure and disaster risk management with Agrorural

In Q1, Forest Trends implemented a course on natural infrastructure and disaster risk management with an emphasis on rural agricultural activities for AgroRural staff. This course was hosted by the Institute for Quality at the Pontifical Catholic University of Peru (PUCP) and trained 78 students (67 men and 11 women) from 19 local offices and Agrorural directorates nationwide to improve their ability to incorporate interventions in natural infrastructure in their zonal plans. Despite efforts to balance the genders within this predominantly male sector, the course did not achieve the female participation desired.

This course ran from October through December 2020 and covered 4 modules: i) Natural infrastructure and ecosystem services in the agricultural sector and their relationship with climate change, ii) Disaster risk management in the context of climate change in the agricultural sector, iii)

Mechanisms for the incorporation and evaluation of NI as a DRM measure in the rural agricultural sector, and iv) Interventions in NI and DRM and sources of financing. Gender considerations were incorporated throughout the modules. The participants prepared natural infrastructure intervention proposals as part of their final group projects required for certification.

In Q3, Forest Trends hired a consultant to provide feedback on the proposals, support implementation of 3 of them, and compile lessons learned to facilitate similar initiatives across the rest of Agrorural's offices. However, Agrorural has not been responding to communication. Forest Trends sent a letter to AgroRural on July 30th and did not receive a response before the end of the fiscal year. This hiatus was most likely due to an institutional restructuring in AgroRural that took place at the same time, as well as the transition in administrations. Forest Trends resumed coordination with AgroRural in October 2021 and will continue follow-up activities in line with our FY2022 Work Plan.

Advanced Course on the Development of Investments related to Natural Infrastructure and Disaster Risk Management within the framework of Integrated Plans in watersheds prioritized by RCC

The course sought to strengthen the development and evaluation of public investment projects in natural infrastructure, specifically those under the Invierte.pe framework and RCC Integrated Plans. The course emphasizes costs and budgets, institutional arrangements, and environmental certification.

It ran from November 2020 through January 2021 and covered two modules: i) Project operations and ii) Economic evaluation. Many of the participants are delving deeper into the subject after having previously participated in the introductory course on the same subject which took place between April and May of 2020. 54 people (34 men and 20 women) graduated from the course; for their final projects they developed 12 natural infrastructure projects for RCC, several of which have already been declared viable (as described in Section 1.3.4).

Course for specialization in the development of public investment projects in natural infrastructure for the recovery of ecosystem services for water regulation with UTEC

This course, hosted with UTEC, aimed to strengthen the capacities of public officials to develop strategic natural infrastructure investments. Participants represented 19 public entities (four regional governments, three district municipalities and three national entities), five EPS, three NGOs and one private company. 63 final participants (43 men and 20 women) received a certificate from UTEC.

The course ran from March through October 2020. For their final group projects, the participants developed 14 Technical Sheets for public investment projects, with a total value of USD 13 million. This is a considerable achievement considering the short time frame of five months, the impacts of the COVID-19 pandemic, and the fact that this was a part-time commitment for the participants. Out of the 14 technical sheets formulated in this course NIWS decided to support the improvement and completion of the two best ones, as follows: i) PIP Blanco river, with the objective of recovering the ecosystemic service of water regulation, Arequipa region; and ii) PIP Urcuyacu, the purpose of this

project is the recovery of the degraded ecosystem in the Urcuyacu, San Martin region.

Training program for journalists 2020: "In search of sustainability for water security"

As presented in Section 1.1.2, SPDA led a training program for journalists with the Gustavo Mohme Foundation and PUCP in Q3, which aimed to strengthen journalism on water resource management and natural infrastructure issues. More details can be found in Section 1.1.2.

MOOC "Sustainable Water Management" with ENAP and SUNASS

As presented in Section 1.3.1, Forest Trends designed a Massive Open Online Course (MOOC) for Sustainable Water Management, which is currently being run on the ENAP platform.

**Additional Initiatives for Capacity Building**

Community of Practice for Project Developers

As presented in Section 3.1.3, Forest Trends developed and launched the Community of Practice (CoP), a virtual space for online collaboration about natural infrastructure.

Capacity Building for Water User Boards

As presented in Section 3.1.6, Forest Trends and ANA have been coordinating a program to strengthen water user organizations (OUA)'s role in watershed conservation.

Voices for Water Event

In Q3, the capacity building team provided support for three workshops under the *Voices for Water* event for communicators (described in Section 1.1.2). The team developed an event guide, and created a dedicated space on the NI Virtual Classroom to enroll participants and upload resources.

ANA Workshop "Organizing High Impact Webinars"

In Q1, at the request of ANA, NIWS held a workshop on organizing webinars for 110 communicators and educators from ANA's Water Culture Unit from across the country. The objective of the workshop was to share NIWS' insights in the design and execution of effective webinars, capitalizing on the experience generated in recent months.

## 4.2 Gender

**Mainstreaming Gender in ANA and SUNASS**

In FY2020, Forest Trends secured commitments from both ANA and SUNASS, the leading water

management institutions in Peru, to mainstream gender in their institutions; developed and launched processes in coordination with each institution's leadership, gender committee, and the MIMP; and initiated a full diagnostic of the current state of gender gaps in each institution. In Q1 FY2021, Forest Trends completed the Institutional Diagnostics and proposal for Gender Mainstreaming Plans for both ANA and SUNASS. From there, each process has taken a different path over the course of the year due to contrasting institutional contexts, as described in this section.

SUNASS

SUNASS has demonstrated leadership on this issue. In December, SUNASS approved its Gender Plan, which focuses on the incorporation of a gender perspective in SUNASS' MERESE Directive and its internal policies, with a focus on human resources. As part of the implementation of the work plan, SUNASS approved a gender equality policy in May—representing a huge milestone towards gender equality. SUNASS, the Ministry of Foreign Affairs and the Agency for Environmental Assessment, and Enforcement (OEFA) are now the only entities in Peru that have approved Institutional Policies for Gender Equality.

The policy has allowed political and institutional support for the implementation of the Gender Plan, which has been progressing steadily with technical assistance from Forest Trends. Activities include measures to close salary gaps between the genders, improve access to decision-making positions, and prevent and punish sexual harassment. Forest Trends and SUNASS are also working together to establish guidelines for all EPS in the country to include a gender approach in their MERESE projects. Forest Trends will continue to support the implementation of the Gender Plan in FY2022, including efforts to implement a training program for the incorporation of gender in MERESE-H, establish a gender quota for SUNASS' University Extension Course, and maintain the momentum for these changes through a change in leadership.

**Francy Cárdenas**

Head of Gender Committee, National Water Authority

Coordination meeting NIWS-ANA

*"The support of NIWS has been decisive in the elaboration of the Gender Plan; their input has been very technical, for which we are very grateful. Now it is up to ANA to adapt this document to the various institutional operational details in order to implement this great management tool."*

ANA

Progress within ANA has been slower. The ANA's Commission for Gender Equality has yet to approve either the Gender Diagnostic and Gender Plan submitted by Forest Trends. The commission has made adjustments to the diagnostic and submitted a revised version to ANA's General Management in Q4.

Forest Trends has been monitoring the review process, which has involved continuously following up with our point of contact and organizing meetings with ANA authorities and MIDAGRI to speed up the approvals. Despite not yet achieving approval of either document,

this internal review process has served to raise awareness about gender issues and inspire commitment to applying the gender approach within the entity. In FY2022, the long awaited approval of the institutional gender diagnosis will open an opportunity to discuss a roadmap to support initial actions, although likely more limited than originally planned, to mainstream the gender approach in the management and services provided by ANA.

**Promoting women's participation in decision-making on water**

Last year, NIWS implemented the Women's Leadership Program for water management, which unfortunately excluded the participation of local leaders even though they were one of the main target audiences, due to connectivity issues because the program was held virtually due to the pandemic. This year, NIWS has designed a specific program for 25 women leaders at the local level. Recognizing the difficulties in access to computers and the internet, NIWS is providing mobile internet service and laptops for temporary use during the program.

There was a large demand for the program—399 women applied for 25 spots. Selections were made in Q3, the program started in July 2021 and will run through February 2022. Participants have expressed gratitude for the program and the access to computers, and expressed determination to achieve the objectives. So far, no one has dropped out despite the challenges of balancing the course with work, home life, and issues related to the pandemic.

The program aims to strengthen leadership capacities to increase gender equality in water management and natural infrastructure. The curriculum covers the physical, social and economic dynamics of a watershed; the importance of natural infrastructure; the regulatory and institutional framework of water resources management; and gender inequality in water resource management. Throughout the program, the participants have improved their use of technology and virtual environments, which was demonstrated through their organization of a forum. The participants will finish the program in FY2022, including submission of their final projects which will be supported by tutoring and mentoring.

**CONAMUCC capacity building**

As part of MINAM's commitment to gender mainstreaming, last year Forest Trends supported MINAM in the formation and installation of the National Interest Group "Women and Climate Change" (CONAMUCC) as part of the National Commission on Climate Change. Forest Trends also supported CONAMUCC to establish its Internal Regulations, which define its structure and functions.

This year, NIWS has continued to strengthen CONAMUCC, consolidating its institutional framework with the following actions:

1. Appointed interim representatives (titular and alternate) to the National Commission on Climate Change and began to participate in meetings and working groups, such as the one for the elaboration of the Regulations of this entity.

2. The First National Assembly was held, at which the titular and alternate representatives to the National Commission on Climate Change and the Coordinating Committee were elected.
3. A work plan for September-December 2021 was prepared and approved, which prioritizes the strengthening of CONAMUCC's capacities.
4. A virtual training session was held on "Regulatory Framework on Climate Change and Gender."

CONAMUCC is an important space to fill the gaps of lack of policies and regional and local coordination spaces to address the impacts of climate change related to water on women, even more so when climate change magnifies the existing gaps caused by traditional gender roles and their impact on the economic, social and cultural organization of the ecosystems in which women live.

**Incorporation of the gender approach in PIPs**

As discussed in Section 3.1.6, a gender approach was incorporated into the development of the ET for the PIP Huamanga, which includes a stipulation that men and women must receive equal pay for reforestation activities. The ET also includes community data disaggregated by sex and socioeconomic gender considerations. This gender approach can be used as reference for other PIPs in the future.

In addition, NIWS developed the document "Guidelines for gender mainstreaming in the natural infrastructure investment cycle" to establish general and specific guidelines for gender mainstreaming in the investment cycle, with emphasis on the formulation and evaluation phase of investments related to natural infrastructure for water security. The document is based on the idea that the differentiated needs of women and men should be considered so that the PIPs propose solutions that contribute to improving the quality of life of both.

**Recognizing advances in closing gender gaps in Peru's water sector**

NIWS organized the Canada Event at Expo Agua called 'Closing Gender Gaps in Water Management' in December 2020. This virtual session clearly presented the information about gender gaps in water management identified by NIWS, international good practices to increase equality in the water sector, presented by OECD Water Governance Initiative, NIWS supported initiative for mainstreaming gender in ANA and SUNASS, and testimonies of notable women regarding women's role in water management. Opening remarks were made by Ralph Jansen, the Canadian Ambassador to Peru and Bolivia, and closing remarks were made by the Vice Minister of Agrarian Policies of MIDAGRI. The event was attended by 1046 live participants from 15 regions of Peru, four international countries (Chile, Bolivia, Canada and Germany), and across sectors of civil society, Government, and academia.

NIWS prepared the publication "Moving Towards Gender Equality in Water Management" in order to share the milestones achieved by NIWS and our partners in closing gender gaps. From public policy advocacy to the strengthening of local leadership, these processes have had the strong participation of many women and men with a common vision: participatory, fair and efficient water governance, in which water security and gender equality go hand in hand to contribute to the development and sustainability

of life in our country. The publication will be finalized, published, and shared in Q1 FY2022.

## 4.4 Administration and Adaptive Management

**Staffing**

As of the close of January 2021, the shifts in staff structure and composition indicated in our FY2021 work plan have been almost entirely implemented. Staff members hired for new positions in Q1 FY2021 include:

- Willy Espinoza, Blended Finance Lead (Forest Trends)
- David Torres, Ecosystem Services Analyst, Blended Finance Team (Forest Trends)
- Yessica Armas, Senior Public Investment Specialist for Integrated Solutions (Forest Trends)
- Claudia Lebel, Public Investment Specialist for Integrated Solutions (Forest Trends)
- Alex Zambrano, GIS Specialist for Integrated Solutions (Forest Trends)
- Karina Santos, Investments Coordinator, Sanitation Sector (Forest Trends) – *staff member departed the team in March 2021, position was reformulated to meet new needs*
- Gilmer Medina, Landscape Planning and Natural Infrastructure Specialist, Sanitation Sector (Forest Trends)
- Liseth Asto, Natural Infrastructure Investments Specialist, Sanitation Sector (Forest Trends)
- Luisa Cifuentes, Ecosystem Services Analyst, Sanitation Sector (Forest Trends)
- Janeth Gamarra, Landscape Analyst, Sanitation Sector (Forest Trends)
- Guisella Infantes, Capacity-Building Coordinator, Cross-Cutting Themes Team (Forest Trends)
- Roxana Ramirez, Gender Analyst, Cross-Cutting Themes Team (Forest Trends) – *staff member was dismissed within probationary period and position will be filled in FY2022*
- Jose Cuadros, Ecosystem Services Specialist, Information for Decision-Making (CONDESAN)

Additionally, the following staff members were hired in FY2021 to fill vacancies in positions that existed including before this fiscal year:

- Mabel Pajares, Administrative Coordinator, Operations & Finance Team (Forest Trends)
- Denis Carrasco, Public Investment Specialist, Regional Governments (CONDESAN)
- Jose Villavicencio, Public Investment Specialist, Regional Governments (CONDESAN)
- Francesca Baxerias, Communications Associate (SPDA)

Additionally, our Senior Coordinators for Investments by the Sanitation Sector and for Integrated Solutions, Oscar Angulo and Abel Aucasime, were both promoted to Leads of their respective teams at the beginning of the Fiscal Year.

While this was clearly a dramatic shift for the project, it was necessary to ensure the appropriate staff dedication to each of our priority clients in our investment portfolio – both because of the complex natures of each of the institutions and sectors we are supporting to navigate this novel path of natural infrastructure investments and because of the incipient nature of the market, which requires our team to

participate significantly in each contract and consulting agreement we execute. We believe the significant advances this year, especially in our investment portfolio, show that this strategic and operational shift has been critical to achieving NIWS objectives.

Our FY2022 staffing structure essentially maintains the same structure implemented in FY2021, with the exception that one administrative position, the Sr. Finance and Administrative Specialist, has been eliminated.

**Procurement**

This year, Forest Trends implemented significant improvements to our procurement procedures, including through:

- Clarifying pay bands and protocols for justifying the reasonableness of the price of contracts;
- Clarifying expectations and minimum content for Terms of Reference;
- Holding multiple trainings for technical staff on procurement procedures;
- Implementing a new dashboard to report monthly on budget execution by budget owner; and
- Increasing efficiency and transparency on review procedures.

These improved procedures have increased our efficiency in initiating and managing consultancies under the project, continuing to improve processes that support improved technical and financial execution of the activity.

After receiving updated guidance from USAID on October 20, 2020, Forest Trends is no longer requesting prior approval from USAID for all technical contracts executed under NIWS. Per the same guidance, we are including a list of all of the technical contracts executed this year in this report's Annexes.

**COVID-19 Crisis**

The COVID-19 pandemic has hit Peru harder than nearly every other country in the world by most measures. In particular, the "second wave" of the COVID-19 pandemic hit Peru in January through April, and on the same day as our World Water Day celebration in March, Peru passed 50,000 deaths due to COVID. In May, official numbers on COVID-related deaths were corrected to reflect double the impact previously reported. Peru has experienced the worst morbidity and mortality rates per capita in the world due to COVID-19, with a recent study estimating 590 excess deaths per 100,000 in Peru during the pandemic, a rate 3 times that experienced in the United States and nearly 15 times greater than that experienced by Canada.[5]

Throughout this year, our staff continued to work primarily from home, although at the beginning of the year we resumed periodic visits to the office and to the field as needed to advance NIWS objectives in

[5] Ariel Karlinsky, Dmitry Kobak. Tracking excess mortality across countries during the COVID-19 pandemic with the World Mortality Dataset. eLife, 2021; 10 DOI: 10.7554/eLife.69336

accordance with new COVID-19 protocols (see below - Occupational Health and Safety). Remote working has been very successful for the NIWS team, even with the incorporation of a significant number of new staff people during this year. We have been able to transition coordinating using online technologies and results-focused approach, thereby allowing us to advance against objectives while working remotely. NIWS continues to observe strict COVID protocols, which have allowed limited fieldwork and meetings to continue relatively consistently throughout the year, except for an extremely intense period during the second wave in Q2.

Some of our team, consultants, and partners were impacted by the virus this year. The second wave particularly impacted members of our team as well as counterparts in a variety of key institutions. At times, work was completely suspended with counterparts due to widespread impacts in their teams (e.g., Regional Government of Moquegua, SEDACUSCO, water utilities in San Martin). Thankfully, our team members have recovered from their COVID-19 cases, and no transmission of the virus has occurred during NIWS activities.

The COVID-19 emergency also has created an impact on NIWS activities by resulting in funds diverted from natural infrastructure to attend immediate health and economic needs. For example, budget for the Chancay-Huaral project (GORE Lima) and the Cachiyacu project (EMAPA San Martin) could not be secured this year because those institutions had diverted available funds due to the pandemic. In the case of water utilities, SUNASS authorized the use of MERESE reserves to cover necessary operational expenses in the absence of regular revenues, which were drastically impacted during the pandemic as water bills were suspended for several months. NIWS is working with those institutions to find alternative sources of funding to move those projects ahead. In this sense, our diversified portfolio of funders across the country has helped us to keep our mobilization strategy resilient in the face of the pandemic.

On the other hand, and inspiring optimism looking forward, vaccinations have rapidly accelerated in the last 6 months, defying expectations with 34 million doses already administered and nearly half of the population fully vaccinated.[6]

Forest Trends and our partners are continuing to monitor the health crisis and relevant regulatory measures associated with it, updating our office, travel, and meeting protocols accordingly with the objective of protecting our staff and partners—especially vulnerable local populations – while advancing NIWS objectives.

**Political Crisis and Transition**

This fiscal year was marked by significant political instability, beginning with a serious political crisis. The crisis was sparked by a sudden presidential vacancy, the election of a new Board of Directors of Congress, and the subsequent formation of a transitional government. The transitional government was

[6] Vaccinations data from local governments via Our World in Data, as reported by The New York Times.

fiercely rejected by the citizens through public protest and demonstrations which led to the resignation of the newly appointed President and his Cabinet of Ministers. The Congress then acted to elect another President, Francisco Sagasti, whose administration served as a transitional government until elections were held in the first part of 2021.

The Sagasti administration successfully managed the transition and provided stability during the period of October through July, although the highly polarized politics surrounding the elections held in Q3 contributed little to the sense of stability. The first round of national elections was held in early April, resulting in far-left wing and far-right wing candidates elected to face off in the runoff for President. In the runoff in June, Peruvians narrowly elected the leftist rural schoolteacher Pedro Castillo to assume the presidency in July. The early days of the Castillo government saw significant economic instability as the markets reflected a mix of fear of an abrupt political shift to the far left and nerves unsettled by a fractious and largely inexperienced Cabinet. Castillo also faces an opposition Congress and a highly polarized political climate, creating concerns about his administration's ability to effectively govern in this climate.

In preparation for the change of administration, NIWS made all efforts to advance and close pending approvals, decisions, and publications with the Sagasti administration. Likewise, NIWS prepared to present the project, our advances, and the opportunities in natural infrastructure and water governance more broadly, to the new administration, including through preparing executive summaries of project achievements to date (e.g., Journey to Water Security described in 4.1.1) and emphasis in our FY2022 work plan on areas that align with priorities of the new administration – like technology and science for policy-making, water sowing and harvesting, and mobilizing investments that benefit rural populations. Thus far, the transition has resulted in limited changes to technical counterparts, allowing sufficient continuity in NIWS partners for project activities to continue without greater concern.

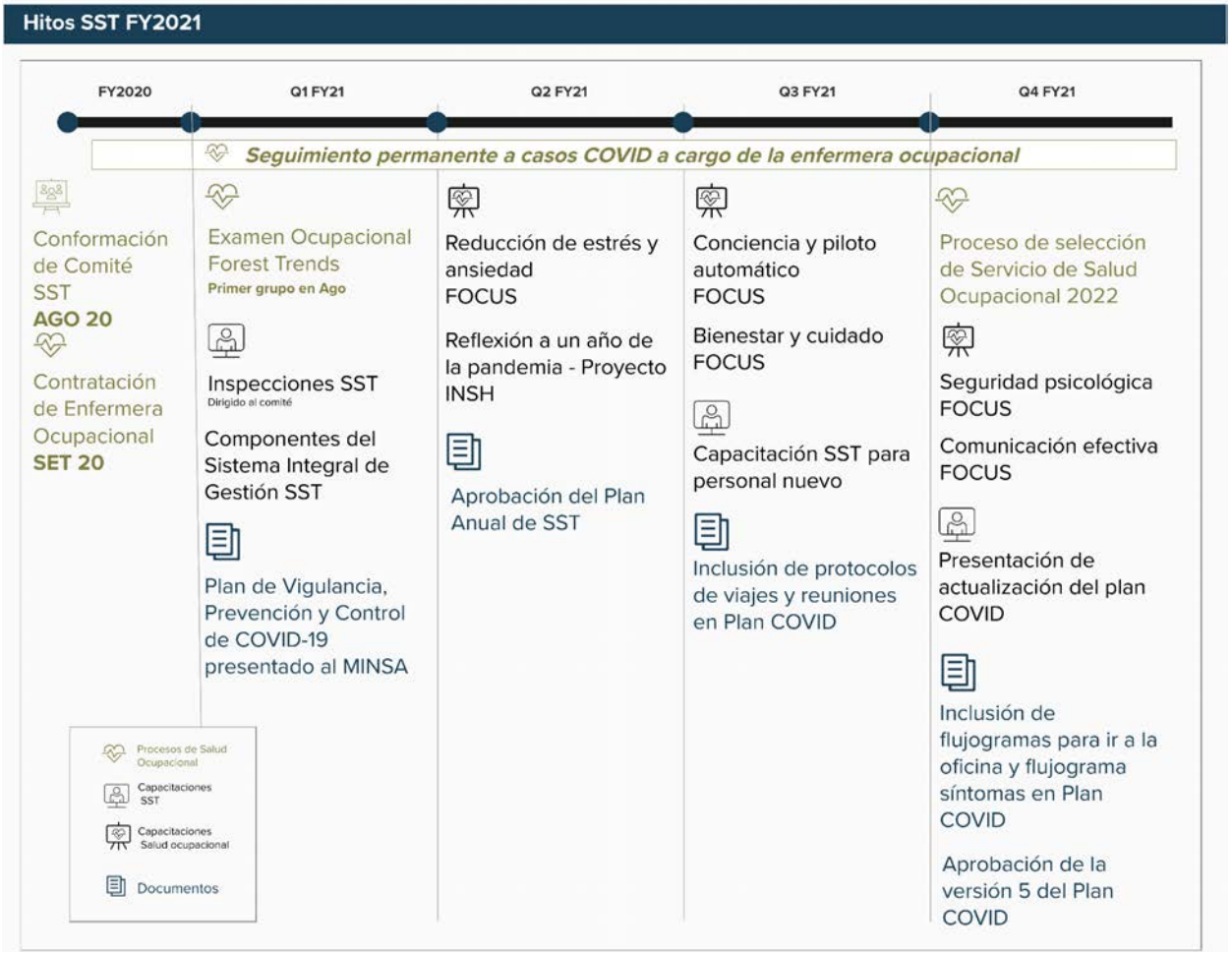
**Occupational Health & Safety**

As part of compliance with Peruvian government regulations, Forest Trends' Occupational Health and Safety (OHS) Committee was formed in August 2021. The committee led the preparation of Forest Trends' first COVID-19 protocols, submitting to the Peruvian Ministry of Health (MINSA) in October 2020, and has led coordination of the OHS work plan through 2021 as well as continuously updating the versions of the COVID-19 surveillance, control and prevention plan, which is currently in its fifth version, last submitted to MINSA in October 2021.

During FY2021, training was provided to the OSH committee, so that they can adequately fulfill their functions, and training was provided to all Forest Trends personnel on occupational health and safety regulations and the protocols approved for COVID prevention. Also, as part of the fulfillment of the OSH plan, FT carried out a wellness program with the objective of providing tools and knowledge to manage stress and anxiety in the context of remote work and the pandemic.

Throughout FY2021, Forest Trends hired the services of an occupational nurse, as required by Peruvian regulations, who was in charge of monitoring the health of workers, including the risks caused by COVID-19, and provided ongoing support to workers who were infected.

**Figure 4-3. Milestones in Occupational Health and Safety**




# MONITORING, EVALUATION AND LEARNING

In the Annexes to this report, Table 2 "Tracking Table" reports the progress on three of the Project's indicators (it is worth noting that, for information purposes, we include indicator updates that are usually reported only once a year). Table 3 details the training events that were held during the quarter, Table 4 and 5 detail the technical and communication products that have been developed by the project; and Table 6 shows the appearance in news media related to the intervention of the project.

# ANNEXES

**1. NIWS Activity Description and Implementation**

**2. Tracking Table**

**3. Events**

**4. Technical products**

**5. Communicational products**

**6. Media reports associated with NIWS activities and outreach**

**7. Annual Report for Standard Indicators**

**8. CBLD-9 Report**

**9. Consultancies**

**10. Calculation of multiple benefits associated with mature NIWS projects**