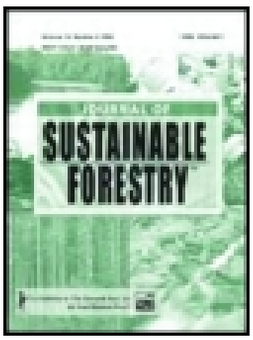

Journal of Sustainable Forestry

ISSN: 1054-9811 (Print) 1540-756X (Online) Journal homepage: http://www.tandfonline.com/loi/wjsf20

Capacity building to advance the United Nations sustainable development goals: An overview of tools and approaches related to sustainable land management

Gillian Bloomfield, Karin Bucht, José Carlos Martínez-Hernández, Aníbal F. Ramírez-Soto, Ixchel Sheseña-Hernández, César Raziel Lucio-Palacio & Ernesto Ruelas Inzunza

To cite this article: Gillian Bloomfield, Karin Bucht, José Carlos Martínez-Hernández, Aníbal F. Ramírez-Soto, Ixchel Sheseña-Hernández, César Raziel Lucio-Palacio & Ernesto Ruelas Inzunza (2017): Capacity building to advance the United Nations sustainable development goals: An overview of tools and approaches related to sustainable land management, Journal of Sustainable Forestry, DOI: 10.1080/10549811.2017.1359097

To link to this article: http://dx.doi.org/10.1080/10549811.2017.1359097

Accepted author version posted online: 02 Aug 2017.
Published online: 02 Aug 2017.

JOURNAL OF SUSTAINABLE FORESTRY
https://doi.org/10.1080/10549811.2017.1359097

Taylor & Francis
Taylor & Francis Group

Capacity building to advance the United Nations sustainable development goals: An overview of tools and approaches related to sustainable land management

Gillian Bloomfield[a], Karin Bucht[a], José Carlos Martínez-Hernández[b], Aníbal F. Ramírez-Soto[c], Ixchel Sheseña-Hernández[c], César Raziel Lucio-Palacio[c], and Ernesto Ruelas Inzunza [d]

[a]Environmental Leadership and Training Initiative, Yale University School of Forestry & Environmental Studies, New Haven, Connecticut, USA; [b]Department of Innovation, Reforestamos México, A.C., Mexico City, Mexico; [c]Pronatura Veracruz A.C., Programa Ecoforestal, Coatepec, Veracruz, Mexico; [d]Universidad Veracruzana, Instituto de Biotecnología y Ecología Aplicada, Xalapa, Veracruz, Mexico

ABSTRACT

The United Nations sustainable development goals (SDGs) provide an ambitious and comprehensive framework for addressing the development needs on a global, regional, and national scale. In order for the SDG targets to be obtainable, diverse stakeholders need the technical, institutional, and organizational capacity to implement the wide variety of initiatives covered under these goals. Inspired by a 2016 workshop, this article synthesizes capacity-building themes and strategies for the following approaches to sustainable development, specifically related to forestry, restoration, agriculture, and other forms of land management. Using three case studies from the authors' experience, we present approaches to building local capacity for sustainable land management (SLM) in the tropics. These projects have taken different steps in order to build technical and leadership capacity as well as develop management or financial skills, and offer insight into various approaches that may be used in order to improve the effectiveness and long-term impact of SLM efforts. By presenting a range of tools and approaches to capacity building, the authors hope that this synthesis can serve as a valuable guide for the development of diverse capacity-building initiatives required to meet the SDGs.

KEYWORDS

Capacity building; capacity development; forest management; sustainable development; sustainable land management; training; tropical conservation; tropical restoration; United Nations sustainable development goals

Introduction

In September 2015, national and international leaders met at the United Nations Headquarters in New York to announce an ambitious and comprehensive agenda comprised of 17 goals and 169 targets to achieve transformational social, economic, and environmental change by 2030. These sustainable development goals (SDGs) provide a comprehensive framework for addressing the development needs on a global, regional, and national scale (UN, 2015). Of the 17 SDGs, this article will focus in particular on capacity-building efforts for the implementation of SDG #15 "Life on Land" with the mission to "Protect, restore and promote sustainable use of terrestrial ecosystems, sustainably manage forests, combat desertification, and halt and reverse land degradation and halt biodiversity loss" (UN, 2015, p. 27).

CONTACT Gillian Bloomfield Gillian.Bloomfield@yale.edu Environmental Leadership and Training Initiative, Yale University School of Forestry & Environmental Studies, New Haven, Connecticut, USA.

In addition to its inclusion in SDG #15, there is a growing recognition of forest and land management as an important component of sustainable development, as demonstrated by its inclusion in other major initiatives and declarations in the global arena. For example, land degradation neutrality was a key target established at Rio+20 in 2012 (UN, 2012), the 2011 Bonn Challenge made ambitious global commitments toward forest landscape restoration (FLR) (IUCN & WRI, 2014), and national commitments toward both FLR and halting deforestation were key components of the 2014 New York Declaration on Forests (UN, 2014). Additionally, Article 5 of the 2015 Paris Agreement calls for action steps to incentivize and implement the reduction of emissions from deforestation and forest degradation (REDD+), conservation, the enhancement of forest carbon stocks, and sustainable forest management (UNFCCC, 2015).

In order for the SDG #15 addressing "Life on Land," and the other targets established in the SDGs, to be achievable, diverse stakeholders need technical, institutional, and organizational capacity to implement the wide variety of sustainable land management (SLM) practices (UNCCD, 2016). We use the term SLM to refer to activities to produce food and fiber, maintain ecosystem services and livelihoods, and enhance the long-term productive potential and ecological value of forests and agroecosystems (GEF, 2016). This term also involves the range of land-use interventions that comprise FLR, including reforestation, natural regeneration, silviculture, agroforestry, improved fallows, and riparian and coastal protection (IUCN & WRI, 2014).

This article explores tools and approaches to strengthening and building local capacity for SLM. We synthesize the results of a 2016 workshop "Capacity building and training: a guided discussion on methods and opportunities for conservation and sustainable development," which was held during the 2016 conference of the Yale Chapter of the International Society of Tropical Foresters. We also present the experiences of three organizations working on the ground to provide capacity building for different land-management activities, with particular focus on tropical mosaic landscapes. It is our hope that this article provides useful insights into the range of tools and approaches available for capacity building for SLM, as a first step toward future analysis of the most appropriate capacity-building activities for implementing the SDGs.

Capacity-building overview for the SDGS and SLM

The importance and relevance of capacity building to sustainable development is featured in the SDG target 17.9 to "Enhance international support for implementing effective and targeted capacity-building in developing countries to support national plans to implement all the sustainable development goals, including through North-South, South-South and triangular cooperation" (UN, 2015). The terms "capacity," "capacity building," and "capacity development" (hereafter referred to as "capacity building") are used widely across the development, health, agricultural, and environmental disciplines as an important step toward achieving the goals of a specific program (Bolger, 2000; Eade, 1997; Jayatilaka, 2003; OECD, 2006).

Capacity building can be broadly defined as activities to "build the understanding, skills, and knowledge base of individuals and organizations…" (Gordon & Chadwick, 2007). In the field of sustainable development, capacity building can support a "process of change," integrating elements such as technological developments, investments, and

institutional changes, in order to better meet current and future human needs (World Commission on Environment and Development, as cited by Jayatilaka, 2003). There has been growing consensus that the effectiveness and performance of international aid and development initiatives are linked to sufficient capacity within recipient countries (OECD, 2006), while capacity-building approaches are seen as important ways to make development activities participatory, people focused, and ultimately sustainable (Eade, 1997). In Article 3 "Decisions to give effect to the agreement," the 2015 Paris Agreement repeatedly highlights the importance of capacity building in general and a specific "Capacity Building Initiative for Transparency" (UNFCCC, 2015).

In broad terms, capacity building can refer to activities and processes to improve "capacity" or performance on a range of scales going from broad systems or sectors, down to organizations and individuals (Bolger, 2000). In this particular article, we focus primarily on capacity building targeted at building individual capacity; however, some overlap can occur between these levels. On an individual level, capacity building for SLM can address stakeholders ranging from local landowners and managers to policy makers and international institutions. It is helpful to think about three levels of stakeholders in a landscape: primary (or direct) stakeholders, secondary (or indirect) stakeholders, and interest groups (or broad stakeholders). For instance, in the context of FLR in the tropics, these stakeholder groups may include land owners, land users, and downstream communities (primary); government agencies (secondary); and national experts, nongovernmental organizations (NGOs), or international organizations (interest groups). (IUCN & WRI, 2014).

In some approaches, capacity-building efforts are designed to focus on the specific needs of a particular stakeholder group. For example, the United Nations Environment Programme has a priority focus on building the capacity of governments by facilitating and supporting institution building and helping them develop policy and environmental laws to promote, require, and incentivize "best practices" in sustainable development (UNEP, 2002). Similarly, the International Forestry Resources and Institutions network has designed training courses specifically for researchers to learn about standardized methods and participatory approaches for monitoring community-managed forests (Wollenberg, Merino, Agrawal, & Ostrom, 2007).

Alternatively, some capacity-building approaches intentionally bring together different stakeholder types in a way that facilitates exchange while addressing multiple needs (Rao et al., 2014). For example, in Sri Lanka, the Integrated Resources Management Programme in Wetlands (IRMP) works to promote community-based environmental management among three main stakeholder groups—civil society, government, and those influenced by commodity markets. In their model, capacity-building activities are designed to create opportunity for multistakeholder engagement and action planning for what they call the "interactive terrain"—where the concerns and efforts of all three of these stakeholder groups overlap (IRMP, 2003).

ISTF 2016 capacity-building workshop

Recognizing the importance of capacity building for tropical land management, the Yale Chapter of the International Society of Tropical Foresters included a workshop on capacity building for the implementation of the SDGs in its February 2016 conference. The 90-minute workshop was led by Yale University's Environmental Leadership and

Training Initiative (ELTI) and designed to help participants evaluate a range of capacity-building tools and approaches of potential use for implementing the SDGs. The workshop was attended by 30 individuals representing academia, NGOs, and private industry, all of whom gathered to discuss capacity-building needs and approaches as they relate to SLM.

During the workshop, ELTI first presented an overview of capacity building and asked the participants to brainstorm on the aspects of sustainable development that best matched their interests. Many of the responses, though not all, referenced SDG #15 "Life on Land," specifically as it relates to sustainable agriculture, reducing forest and land degradation, landscape restoration, sustainable forest management, and other SLM interventions. Then, the workshop participants had the opportunity to identify and discuss capacity-building tools and approaches most needed to help key stakeholders address the challenges they face in implementing SDGs related to land management. Participants were divided into groups where they considered one key SLM intervention and discussed their answers to the following questions: Who are the relevant stakeholders?; What are the primary challenges that those stakeholders face?; What subject matter for capacity building is of most importance to meet those challenges?; What tools and strategies for capacity building are most appropriate?

Most of the groups chose to focus on the need to build the technical and leadership capacity of individuals to (a) make decisions on the most appropriate land-management interventions for a given area, (b) successfully implement specific SLM initiatives, and (c) engage with multiple stakeholders for landscape-scale management. Workshop participants identified stakeholders, such as farmers and other land managers, community groups, agricultural extension agents, and local NGOs, as key audiences for capacity-building activities on sustainable forestry, agriculture, and land-use planning.

In the case of this workshop, most of the discussion focused primarily on activities for building the capacity of individuals as opposed to a broader scale organizational or institutional capacity building. This trend was likely in part due to the ELTI's role in introducing the workshop with a framing presentation that provided examples of individual-focused capacity-building activities for forest conservation and restoration. However, there was some mention of building the capacity of consumers, governments, and private companies with respect to the creation and support of markets for goods produced through SLM practices. Additionally, participants highlighted the importance of building capacity of national and international leaders to make policies and establish legal and financial mechanisms to create incentives for sustainable development and reduce barriers to achieving the SDGs.

Many of the approaches and themes for capacity building that were discussed in the workshop are activities that are being implemented by organizations aiming to build capacity for SLM today. The remainder of this article presents three case studies of such organizations, outlining their activities, objectives, scope, and experiences from their work to exemplify the role and use of capacity building for the SDGs.

Three case studies of approaches to capacity building for SLM

To complement the synthesis of the themes raised in the 2016 workshop, this article highlights the capacity-building experiences and recommendations of three organizations in which the authors are involved. *Pronatura Veracruz* (PV), *Reforestamos México* (RM),

and Yale University's ELTI are all organizations involved in the design and delivery of capacity-building opportunities for individuals who work to implement or influence sustainable agriculture, restoration, and forest management. These organizations use various capacity-building tools, ranging from field-based and online courses to mentorship and "skill building" opportunities, and target various stakeholders from forestry students to field practitioners to policy makers.

Pronatura Veracruz

PV is a Mexican NGO devoted to the conservation and restoration of native ecosystems while improving local livelihoods. Specifically, PV has developed a program to build capacity for ecological restoration of local forests, oriented mainly toward montane cloud forests and mangrove forest rehabilitation using a series of specialized courses with e-learning and fieldwork components. The main objective of PV's capacity-building approach is to build skills among key stakeholders with different levels of influence for designing ecological restoration projects. Participants practice and apply skills, including conducting site diagnostics, planning, funding, timing, monitoring and communications, as they develop comprehensive restoration projects.

Context and motivation for capacity building

Mexican forest ecosystems have seen significant losses since the middle of the last century, mainly due to anthropogenic activity and land-use change. By 2011, 71.3% of Mexico was classified as a human-degraded ecosystem, with only 28.7% land area remaining as relatively undisturbed forests (CONABIO, 2014). Those human-degraded ecosystems were previously dominated by mangrove forests, lowland humid forests, and tropical montane cloud forests. Especially in former or degraded cloud forests, many government-led restoration efforts have focused on industrial forestry projects that substitute the original species-rich forests with species-poor pine forests, without strong considerations of ecological and SLM practices (González-Espinosa et al., 2009).

In the case of mangrove forests, many restoration projects tend to lack sufficient analysis identifying optimal areas for restoration (Hernandez-Melchor et al., 2016). The projects also disproportionately focus on tree nurseries rather than on restoration sites themselves; most projects choose seedling number as the main performance indicator, rather than selecting indicators related to the planting and growth within the reforestation area (Zaldívar-Jiménez *et al.*, 2010). The *Programa Nacional Forestal* (PRONAFOR, formerly *ProÁrbol*) reports low survival rates of seedlings transplanted in 2006, 2008, 2009, 2011, and 2012 (63.2%, 54.9%, 57.5%, 46.20%, and 40.29%, respectively), while tree survival is not monitored beyond the first year (CONEVAL, 2013; UACH, 2010). Because of these challenges with restoration in Mexico, capacity building to advance ecological restoration practices is of special significance (Ceccon, Barrera-Cataño, Aronson, & Martínez-Garza, 2015).

The focal stakeholders for PV's capacity-building activities include government officials, policy makers, community leaders, and other individuals who design restoration projects. These stakeholders face several common challenges: generating alternative livelihoods from productive restoration activities, finding innovative and effective funding strategies, increasing survival rates of planted seeds and seedlings, finding effective

performance measures, developing negotiation skills to help facilitate work with private landowners and local communities, building clear schemes for spatial prioritization and decision-making, and developing legal instruments for objective assessment of restoration project outcomes (Ceccon et al., 2015; Linding-Cisneros, 2010).

PV focuses their capacity-building activities on: (a) developing diagnostic tools for assessing priority restoration areas; (b) enhancing the knowledge and skills needed for working with private landowners and communities; (c) improving decision-making processes based on technical and local information; and (d) building restoration projects based on diversified techniques. With respect to restoration techniques, PV has begun emphasizing the use of applied nucleation techniques by which trees are planted in groups as "tree islands" or "recruitment foci" to accelerate natural recovery of degraded ecosystems (Corbin & Holl, 2012).

Tools and approaches to capacity building

PV's capacity-building activities are conducted in the form of blended field and online courses. These specialized courses are short duration (4 months), and either nondegree or for college-credit, aiming to provide practical training built on a basis of e-learning content backed with fieldwork. Beginning in 2011, PV has delivered specialized, annual training courses, developed with a recognized academic institution, *Instituto de Ecología A.C.* (INECOL) and an international conservation organization, NatureServe. The courses are based on an online platform designed to instruct 30–50 students per course. Students are selected primarily from academic programs, federal governments, and other sectors including freelance consultants, technical staff from nonprofit organizations, and community leaders. Courses are designed for students to develop individual projects with a deep understanding of ecological restoration over the course of five modules. Scientific and technical issues are addressed by a group of guest instructors and project advisers (a collective pool of 107 specialists).

Collaborators include scientists from diverse universities and research institutions in Mexico (e.g., *El Colegio de la Frontera Sur, Universidad Veracruzana's Centro de Investigaciones Tropicales, Colegio de Posgraduados, Instituto de Investigaciones Forestales, Agrícolas y Pecuarias, Universidad de Ciencias y Artes de Chiapas*, and *Universidad Nacional Autónoma de México*) as well as international institutions (such as Griffith University and the International Institute of Tropical Forestry). Private groups such as Holcim (a cement company), Pladeyra S.C. (an environmental consultant firm), Sendas A.C. (a conservation nonprofit), and Wetlands International also contribute to online lectures. While strongly rooted in their local experience of Veracruz, Mexico, PV has found that, at times, capacity-building needs go beyond their specific area of expertise, and strategic alliances can supplement organizational needs. In this way, successful capacity building is an interdisciplinary effort.

Online content of the courses includes theory-based written material, short videos about restoration techniques and approaches, prerecorded presentations by international experts, a virtual library, and a series of individual exercises. Several advisors assess student progress and suggest approaches, readings, contacts, and complementary activities in order to improve individual projects during each course. Courses also include fieldwork at selected demonstration sites in cloud forests or mangrove forests, where students use tools and techniques for site diagnosis, ecological restoration planning, and social and

community assessment. These demonstration sites are each areas in which PV has carried out ecological restoration in the past 8 yr. Different restoration techniques are highlighted, but with a focus on applied nucleation (Corbin & Holl, 2012) and passive restoration methods (Holl & Aide, 2011).

Students' final projects include a conceptual, technical, and historical framework; a proposed methodology for restoration; a list of potential partners; a proposal for project performance evaluation; a project schedule; and a list of potential finance sources. The final element of the course is an individual presentation of the final project to the course committee and the course attendants in a virtual session, where students are asked to present specifics about their projects, such as site selection, budget, timing, economical trade-offs, and social relevance of the project. The projects are also designed so that they can be implemented on the ground or shared with federal and state decision-makers, with the intention of influencing policies regarding ecological restoration.

Results to date

Since PV began its capacity-building program in 2007, 262 students have completed the program, 206 in montane cloud forests and 56 in mangrove forests. The audience trained mostly comprised of young researchers (31.3%), government specialists (26.7%), and technical staff at NGOs (18.7%). PV would like to increase the current percentage of independent consultants (4.2%) and community leaders (2.2%).

To date, in their project work, participants have identified restoration potential in 20 different states of Mexico and in several Ibero-American countries (Colombia, Ecuador, Guatemala, Panama, and Spain). Most of those projects focus on restoration implementation frameworks and policies, climate change, ecosystem-based adaptation, and restoration of productive lands. These projects have helped influence policy and applied PV's restoration approach to tropical montane cloud forests and mangrove forests in Mexico, Colombia, and Guatemala. As an example, one former participant was able to use their course project to encourage the *Comisión Nacional de Áreas Naturales Protegidas* to include applied nucleation techniques (Corbin & Holl, 2012) as a desirable approach for sustainable development projects in its Programa de Conservación para el Desarrollo Sostenible (PROCODES; English translation: Conservation for Sustainable Development Program) program (DOF, 2015). In another case, a former PV course participant submitted their final project to UNDP and received the funding to hold a March 2016 workshop in collaboration with PV on mangrove restoration in Guatemala targeting six local organizations and 40 participants (PNUD, 2016).

The courses have resulted in numerous partnerships and contacts established among its participants, which in turn amplifies the reach of PV's approach to restoration. PV's courses have grown considerably each year. The increased recognition has led to increased financial support from diverse organizations in order to provide partial or full scholarships to cover the participants' tuition.

Reforestamos México

RM is an NGO that was founded in 2002 with the mission of reducing deforestation, improving sustainable forest management, and enabling the restoration of degraded lands.

In particular, RM works as a bridge between different sectors in Mexico that have an impact on forests to help ensure that Mexico maintains the trees and forests it needs for its ongoing development. RM promotes activities to increase the competitiveness of the forest sector among different stakeholders (defining competitiveness as the ability of forest management industries to attract and retain the talent and resources needed to generate sustainable development). RM operates under the idea that if forests generate wealth for their inhabitants, then those people will be incentivized to protect them (ICoFE, 2014).

RM's capacity-building activities work with forestry bachelor's students to develop their entrepreneurial skills and empower them to implement innovative approaches to sustainable forest management. By building capacity in this area, RM aims to increase the quality of life for local communities while providing incentives for maintaining and increasing forested ecosystems.

Context and motivation for capacity building

In Mexico, 55–68% of forests are owned by local communities, including, but not limited to, organized community groups called *ejidos* (Blaser, Sarre, Poore, & Johnson, 2011). In community-managed land, *ejidos* and local communities decide which activities take place on their land, such as agriculture and livestock raising along with management of forestland, as well as where they implement tourism, timber extraction, or conservation projects (Bray, Merino-Pérez, & Barry, 2007). To conduct their forest management activities, they often work alongside a forester who has professional training in management. The professional forester's role is to advise communities on the natural functioning of the forest and develop a management plan for the management and conservation of the forest (DOF, 2005).

Across Latin America, forest management is often considered a cause of deforestation; however, if done sustainably, it can be a strategy for conserving forests (COFLAC, 2015). The *Comisión Nacional Forestal* (CONAFOR, the government institution responsible for the promotion of forest management in Mexico) has recognized the need for improving forest education and training of foresters to increase their capacity for sustainable forest management (DOF, 2013).

With this identified need, RM has focused their capacity-building efforts on cultivating new talent among young people who plan to work as professional foresters by helping them foster a vision of sustainable forest management and to develop sustainable forest enterprises. To do this, RM runs the Young Forest Entrepreneurs program, aimed at building the entrepreneurial skills of students while also working with professors on the importance of developing an entrepreneurial vision, mindset, and skills for their students.

In Mexico, there are now 34 universities that grant forestry degrees. The first was founded in 1933; however until 2001, there were only 12 in the country. This recent increase in schools that offer courses on forestry shows the growth of the forest sector in recent years. These universities are public, belonging to federal or state educational systems. On average, each has 100 students, though a few (such as *Instituto Tecnológico de El Salto, Durango* and the *Instituto Tecnológico del Valle de Oaxaca*) have over 300 each.

In 2015, RM conducted a study of Mexican forestry students, which further solidified the importance of their approach. The survey found that 80% of Mexican forestry students are from rural communities. Although the universities are distributed across different

regions of the country, their teachings are oriented toward managing temperate forests and little knowledge is developed about the management of tropical forests. Moreover, they tend to focus on technical topics, leaving aside social and economic aspects. In general, young people enrolled in these programs are eager to gain more knowledge and skills than the standard forestry curriculum allows.

According to RM's 2015 survey, students lacked skills in leadership, teamwork, and networking. The development of these skills is important because, according to the study, the skills most demanded by forest employers for professionals working in the field are: (a) the ability to solve problems, (b) the ability to work independently, (c) the ability to work in groups, (d) the ability to organize, plan, and coordinate, and (e) the ability to learn. All of the skills mentioned in this study could be considered "soft skills," which reinforced RM's capacity-building vision that developing these soft skills can be even more important than technical skills to achieve high performance of foresters in the workplace (Beh-Miss, Martínez, & Rodríguez, 2016).

Tools and approaches to capacity building

The Young Forest Entrepreneurs program, launched in 2013, organizes student visits to large forestry companies, with which universities often lack connections. RM also organizes trainings by other entrepreneurial focused universities and promotes dialogue between them using tools such as social networks. Since first conceiving of the program, RM has engaged in outreach and awareness-raising activities with the directors of forestry schools in Mexico. RM then works with those schools to integrate into the curriculum opportunities for learning and building "soft skills" related to forestry entrepreneurship and working with local communities for sustainable forest management. In order to maintain a continuous training of forestry students with business skills, RM places a strong emphasis on training teachers at the forestry schools as well. Since 2014, RM has facilitated a course for teachers where they learn about the experience of forestry companies and incubators that have entrepreneurship programs.

In addition to the general curriculum, RM conducts workshops to train the students on how to generate "forest enterprise proposals." These are advised by a professor, which ensures that university staff is also involved in developing a more entrepreneurial mindset. The best proposals enter a contest where the winner is awarded a year of funding to realize the business idea. The most important goal of RM in training forestry students is that young people are encouraged to acquire the skills needed to be an agent of change in their locality. The company that they propose to build to participate in the Young Forest Entrepreneur Program may or may not be the means by which they eventually make a living, but the program aims to provide a way in which youth can be motivated to seek training oriented to the needs of the forestry sector.

Results to date

From 2013 to 2016, 2,500 forestry bachelors' students have participated in workshops organized by RM. The Young Forest Entrepreneur contest has seen an increase in submissions from 11 proposals received from five Mexican universities in 2014, to 27 proposals received from 18 Mexican universities in 2015, and 62 proposals from 30 universities in 10 countries in Latin America in 2016. In the 2017 program, 112 proposals from 10 countries were received. RM views the growth in this program as significant,

demonstrating that more students and teachers are participating. They soon hope to monitor the extent to which the school projects and research theses are turned into feasible businesses with impacts on land use.

As an example, the increased capacity of students is demonstrated in the increase in recognition of Young Forest Entrepreneur participants in broader forestry events. Every 2 yr, CONAFOR holds an On-Campus Forestry Expo to feature the latest advances in the forestry sector and showcase the best forestry proposals by Mexican university students. During the last On-Campus Expo, 12 of the 15 selected proposals came from participants in the Young Forest Entrepreneur program.

Another result of RM's activities has been the change in student professionalism and engagement observed by the forestry professors at participating universities. Professors noted a change from the apathy of students in the first 5-hr workshop to the enthusiasm at the end of the program when students are excited to formalize their company proposal and participate in the contest. RM uses the quality of student proposals as an indicator to evaluate RM's influence and opportunities for improvement. Although RM has observed some cases in which the quality of proposals did not improve, despite an increase in number of proposals, they have observed an overall improvement in the level of professionalism of the students' business proposals, product definition, and understanding of their projects' potential impact on forests.

RM also observed low participation and skepticism of the professors when the program began. However, in a few years, the teachers have become more engaged as they note the improvements in their students' written and public communications, self-confidence, teamwork, creativity, and resource management. Now that interest among professors has increased, RM is planning a program to improve teachers' skills through face-to-face and distance courses that adapt entrepreneurship concepts to the forest context, provide them with tools for the development of soft skills, and encourage the exchange of experiences between them. Additionally, the need for a new vision for forestry education is not exclusive to Mexico; RM has started expanding its work to other universities in Latin America with similar contexts and challenges.

Yale University's Environmental Leadership and Training Initiative

ELTI was created in 2006 to connect the people who manage and impact human-dominated landscapes with the knowledge, tools, and resources to support their efforts to implement sustainable land-management practices. As a program at the Yale University School of Forestry and Environmental Studies, ELTI was designed to link landholders, practitioners, and decision-makers with scientific knowledge and applied experience to increase native tree and forest cover in an array of land-use contexts in the tropics. ELTI's capacity-building activities aim to offer training and leadership development opportunities to a wide variety of environmental decision-makers in the tropics, including practitioners; public officials; extension agents; technical personnel; foresters; agronomists; farmers; community leaders; consultants; and other government, nongovernmental, and private sector professionals.

Context and motivation for capacity building

ELTI works primarily in tropical Asia and the Neotropics with a wide range of stakeholders facing different environmental challenges. For many of the stakeholders with whom ELTI works, the local contexts of these regions require land-management strategies that aim to improve ecosystems services as well as to maintain and enhance local livelihoods.

Although headquartered at Yale University, ELTI has field staff members who work side by side with local partners to identify the training needs in each country and integrate valuable local knowledge and practical experience into the capacity-building activities. In the Philippines, for example, decades of efforts to reforest the country have historically relied on the planting of a small number of exotic timber species (Bande et al., 2015). This trend is attributed to the potential economic return of exotic timber species, as well as a lack of knowledge about native trees in the country. These species, however, have exhibited poor growth and adaptation to the ecosystems, are prone to disease outbreaks, and are susceptible to hurricanes and other weather events. Overall, they have done little to mitigate the threats to the Philippines' dwindling natural forest areas, and less so to restore them (Neidel et al., 2012). Increasing the local and national capacity for native species reforestation, therefore, has become an important approach of ELTI's work in the Philippines, in partnership with the Rain Forest Restoration Initiative and Visayas State University.

In Panama and Colombia, there is increasing interest in more sustainable, tree-based land practices (Garen et al., 2009), as cattle ranchers face losses in productivity, high amounts of degradation, and vulnerability to droughts and soil erosion as a result of unsustainable agricultural practices (Slusser, Calle, & Garen, 2015). Meanwhile, increases in the amount and diversity of forage, production of timber and nontimber forest products, and erosion control have been observed after the establishment of silvopastoral systems and restoration of tree cover within degraded cattle ranching lands (Calle et al., 2013). Building the capacity for farmers, practitioners, and other decision-makers to establish silvopastoral systems, connectivity corridors, and other tree-based ranching strategies on their lands is, therefore, a strong focus of ELTI's work in the Neotropics along with partners, including the *Centro para la Investigación en Sistemas Sostenibles de Producción Agropecuaria* (CIPAV) and the *Asociación de Productores Pecuario y Agro-silvopastoriles de Pedasí* (APASPE).

In addition to the ELTI's work in the Philippines, Colombia, and Panama, ELTI also has field programs working to build capacity for SLM among stakeholders in Brazil and Indonesia. The program also reaches broader audiences in Africa, Asia, and Latin America through online training courses.

Tools and approaches to capacity building

ELTI's field courses are typically designed to integrate scientific theory and practical, "on-the-ground" experience relevant to the sustainable management of tropical forest landscapes comprised of a mosaic of land-use practices. Most of the field courses last from 3 to 6 days, during which ELTI staff, local partners, and other guest experts provide classroom lectures, lead guided visits to demonstration sites and educational trails, and facilitate field and classroom exercises. Some of these courses have been structured as technical workshops on subjects such as nursery establishment, plant material production, and

monitoring of native trees species. Similarly, some courses are focused on building technical and organizational capacity for specific types of land management, such as courses on mine site rehabilitation, establishment of silvopastoral systems, mangrove rehabilitation, and native species reforestation. Other courses are much broader in approach, presenting a range of different management strategies within the same training, such as courses on ecosystem services, tropical forest restoration, and payments for ecosystem services.

For the delivery of field courses, one of ELTI's strategies is to employ a geographically flexible approach that brings specific courses to different communities or regions within a country. In Colombia, for example, ELTI partnered with CIPAV and the *Federación Colombiana de Ganaderos* (FEDEGAN) in 2014 to implement a course on ecological restoration in cattle ranching landscapes in three different regions. ELTI's other strategy for delivering field courses is to develop and use focal training sites. The prevalence of ongoing research and restoration projects in the focal training sites are ideal for developing and presenting standardized training materials, corresponding trail systems with field exercises, and demonstration case studies with landowners (Garen, 2014). This approach has been most advanced in Panama, where ELTI has been working in the dry forest region of the Azuero Peninsula.

In addition to field trainings, ELTI has also been holding online courses since 2013 designed for a broader pan-tropical audience. Each course features a range of teaching tools, such as lectures, videos, slideshow presentations, international case studies, live discussion sections, and readings. Additionally, a key component of ELTI's online courses is their homework assignments, through which the participants design a preliminary management plan for their own restoration work. Because the participants of these courses come from a wide range of countries and local contexts, the courses are designed to guide participants through the process of evaluating local ecological and sociopolitical potential for restoration, and selecting the best approach to meet their goals regarding SLM (Bloomfield, 2016).

Some of the ELTI field and online courses take a "training-of-trainers" approach designed to give participants the skills and techniques to conduct their own subsequent training in their own organization or community. This approach is most developed in the Philippines, where participants of the "Rainforestation Trainers Training" program attend the courses in order to support their efforts to develop land rehabilitation programs using native species restoration techniques. They learn how to establish community nurseries and demonstration plots and are required to facilitate similar trainings in their own communities for the preparation and implementation of their projects (Neidel & Consunji, 2011).

In addition to the field-based and online trainings, ELTI organizes conferences and symposia on emerging issues of importance for tropical conservation, restoration, and sustainable use. These events are intended to build capacity by creating a platform for the exchange of information between national and international experts and facilitating engagement and lasting connections among speakers and diverse audience members.

Finally, an integral part of ELTI's capacity building is the follow-up support alumni of the training program can receive via ELTI's "Leadership Program." This program is designed to enable alumni to (a) develop their own conservation or restoration project, (b) receive additional training or mentoring to advance their ability to implement projects,

(c) present their work at conferences and symposia, and/or (d) receive support to conduct a subsequent training in their own organization or community (Garen, 2014).

Results to date

From the start of the program in 2016 to March 2017, ELTI has conducted around 60 field-training events in Asia and the Neotropics, training close to 2,000 participants. Through its online training program, ELTI has trained over 450 professionals worldwide, from 48 countries. ELTI's events have involved a variety of individuals, partners, and perspectives to the design of capacity-building activities that are tailored to local needs and are adaptable to changing ecological and social conditions. Designing courses with in-depth personal projects has helped ELTI to maximize the possibility for participants to apply what they learned and optimize their decisions about land management. For example, one participant of an ELTI online course developed a management plan for slope stabilization and erosion control in the Santander province of Colombia. In February 2017, that participant received ELTI follow-up support to train 160 local stakeholders on the specific technical aspects of implementing the restoration plan.

Through its Leadership Program, ELTI has provided participants with over 260 opportunities for follow-up assistance. In the Philippines, an ELTI alumnus received ELTI Leadership Program support to write funding proposals, organize Rainforestation trainings, and draft policies for his municipality. As a young and influential public officer, his efforts have resulted in the rehabilitation with native species of 200 hectares within the watershed of his municipality. Once example of building technical, organizational, and leadership capacity is from the work in Panama with the farmer group APASPE. As a result of ELTI's farmer trainings on sustainable cattle ranching since 2009 and detailed follow-up support with partner CIPAV, local farmers have formed a community group, received international grants, established demonstration farms, and now serve as co-facilitators of ELTI field courses in the region (Slusser et al., 2015).

Synthesis of workshop and case studies

The SLM interventions identified in the workshop and capacity-building themes addressed by the case study organizations show a clear link to SDG #15 "Life on Land", as well as highlight the interconnected nature between SLM activities and the implementation of other SDGs. The work of ELTI, RM, and PV to build capacity for SLM strongly relates to other SDGs, including the following: (a) climate change mitigation and adaptation components of SDG #13 "Climate Action", (b) the components focused on the connection between sustainable land-use practices to water efficiency and quality of SDG #6 "Clean Water and Sanitation," and (c) SDG #12 on responsible consumption (UNCCD, 2016).

Additionally, the work of PV and ELTI to enable the use of silvopastoral systems, agroforestry systems, and other sustainable agricultural production techniques demonstrates that building capacity for SLM can advance SDG 2.4 on sustainable food production and SDG #3 on good health and well-being. These connections are supported by the work of the United Nations Convention to Combat Desertification (UNCCD). The UNCCD provides examples from Africa in which SLM practices have led to enhanced

productivity with less input of fertilizers and pesticides, thereby reducing the negative impacts of agriculture on human health and biodiversity (UNCCD, 2016).

Each organization has a strong interest in enhancing the knowledge, leadership, skills, and professional networks of the participants. In doing so, the tools and approaches that the three organizations use for capacity building further advance SDGs of SDG #7 "Quality Education," specifically SDG #4.4: "By 2030, substantially increase the number of youth and adults who have relevant skills, including technical and vocational skills, for employment, decent jobs and entrepreneurship" and SDG #4.7 by which "by 2030, ensure that all learners acquire the knowledge and skills needed to promote sustainable development" (UN, 2015).

Tools for building capacity for SLM

The variety of capacity-building tools and techniques highlighted in the three case studies and discussed in the capacity-building workshop serve to achieve capacity-building goals by facilitating instruction, discussion, collaboration, exchanges, skill building, and overall learning (see Table 1).

Training courses and technical workshops are commonly considered a key tool for local capacity building, especially for technical knowledge and skills (Cicin-Sain, Knecht, & Fisk, 1995; Rao et al., 2014; Wollenberg et al., 2007). Such courses can include lectures in a classroom setting, field visits, and demonstrations, as well as exercises in either setting (classroom or in the field). Additionally, shorter, technical training events, mentorship opportunities, extension services, and other similar tools can impart information and specific skillsets to participants (Slusser et al., 2015). These approaches are particularly appropriate for increasing awareness, interest, practical skills, and technical knowledge related to the implementation of sustainable land-use practices. The development and distribution of print and online resources (Nelles, 2011) can accompany training events, or serve as useful resources to advance capacity-building objectives outside of training events.

Participatory workshops can be designed as dialogues or discussions, to bring together different stakeholders to share perspectives and collaborate to build mutual understanding or consensus. These are especially important when dealing with competing interests and lack of communication among different stakeholders. Site visits, "farmer-to-farmer" exchanges, and "peer-to-peer" exchanges can also facilitate and strengthen opportunities for various stakeholders to interact and exchange knowledge and perspectives (Calle et al., 2013; Slusser et al., 2015).

In an age of increased online connectivity, greater options arise to expand the reach of capacity-building efforts to a broader audience and to utilize options for training, as well as to network in a virtual sphere. Both ELTI and PV use online tools and web course platforms, which feature online training modules comprised of video lectures, presentations, case studies, readings, live sessions, discussion forums, and computer-based assignments (Bloomfield, 2016). "Blended" courses offer a mix of online and field-based learning tools and exercises. Online training may be helpful in reaching distant audiences who do not have the time or resources to travel to the same location for field training. Online training can also be an important tool for building

Table 1. Synthesis of tools and techniques for building local capacity for the United Nations sustainable development goals relevant to sustainable land management.

Tools	Components	Goals and outcomes
Instruction and participation		
• Training courses (field, online, blended)	• Lectures and presentations	• Raise awareness about an issue
• Technical workshops	• Field visits and demonstrations	• Present theory or scientific basis
• Extension services	• Activities and exercises	• Present practical examples
• Mentorship and individual skill building	• Online training content	• Train on applied techniques and technical skills
• Training-of-trainers	• One-on-one instruction and guidance	• Build "soft skills" necessary for advancing leadership capacity
	• Case studies	
Discussion, collaboration, exchange		
• Stakeholder dialogues	• Facilitated discussions	• Facilitate sharing of ideas and experiences
• Participatory workshops	• Participatory project planning	• Identify stakeholder priorities
• Peer-to-peer	• Project evaluation	• Brainstorm possible
• exchanges	• Peer-to-peer site visits and demonstration exchanges (farmer-to-farmer, local, regional, or international exchanges)	• courses of action
• Conferences and symposia	• Case studies	• Build understanding or consensus among different stakeholders
	• Websites and online platforms for discussion and exchange	• Plan for program implementation
		• Evaluate program successes and shortcomings
		• Raising awareness and comfort level with different techniques
Published and prepared materials		
• Print resources	• Guides, manuals, handbooks	• Present critical information (theory, examples, techniques) that can be used alone or in conjunction with a training event
• Online resources	• Textbooks and lecture notes	• Provide resources needed for decision-making
• Other media	• Popular and peer-reviewed journals and articles	
	• Websites, databases, information clearinghouses	
	• "Toolkits" and protocols	
	• Music, video, games, other media	
Institutional and Leadership Capacity		
• Professional development	• Presentations, materials, mentorship, assistance	• Enhance skills and literacy related to business, finance, policy making, project management, and/or leadership
• Mentorship and individual skill-building	• Guided activities and exercises to build practical "soft skills"	• Set up mechanisms (legal, financial, institutional structure) for the completion of project goals
• Training-of-trainers		

collaborative networks by helping participants discover and engage with a wide variety of potential partners.

Mentorship, exchanges, and skill-specific training courses could be used to increase institutional or organizational capacity of diverse stakeholders. As exemplified by the RM case study, beyond the technical aspects of SLM, capacity building can enhance business and financial skills, leadership capacity, project management, and knowledge of how to access funding and credit. Online and field-training approaches can also be useful for a leadership building or "training-of-trainers" approach by which national, regional, or community leaders gain the tools and knowledge needed to lead their own capacity-building efforts within the area of their jurisdiction.

In addition to the strategies highlighted in the case studies, we recognize that other tools can be employed to build the capacity of national and international leaders to make policies and establish legal and financial mechanisms for sustainable development and otherwise create incentives for and reduce barriers to achieving the SDGs.

Approaches, challenges, and recommendations for building local capacity for SLM

The participants of the 2016 workshop outlined seven key activities for designing and delivering a capacity-building program, which are further supported by the approaches of the case study organizations as follows: (a) identifying needs, gaps and knowledge, and ways to bridge them through training; (b) identifying and sharing best practices; (c) giving people tools and techniques to enable them to solve their own problems; (d) developing experts who are knowledgeable and willing to work and share their knowledge; (e) identifying skills that already exist and further building or emphasizing these abilities and individual capacities; (f) creating platforms for exchange between stakeholders; and (g) designing "toolkits" for implementing actions.

Additionally, through the experiences of each of the three organizations, the authors provide insights into the process of capacity building, possible approaches, and challenges faced. In particular, the experiences of these organizations highlight the importance for "needs-driven capacity building," as well as incorporating practical outputs for participants into training courses and providing follow-up support to individuals. Additionally, monitoring and evaluating the outcomes of capacity building can help the organizations to understand the results of their efforts and engage in adaptive management.

Needs-driven capacity building

The experiences of the three case study organizations highlight the importance of tailoring local capacity-building activities to local needs and contexts. All the three organizations have chosen to focus their capacity-building efforts on land-management strategies that integrate sustainable practices with productive activities to maintain and enhance local livelihoods. For example, RM specifically designed its Young Forest Entrepreneur program in response to needs identified by local communities who were looking for foresters who could help promote business ventures that are in line with conserving and sustainably using forest resources. ELTI and PV work to provide restoration strategies that are compatible with the needs of local landholders to improve their agriculture and livestock production practice and to benefit from improved provisioning of ecosystem services.

One opportunity for expanding and building upon current activities has to do with capacity building for policy makers. PV and ELTI have included policy makers as participants in some of their trainings, but they recognize that specialized training events,

network building, and social outreach could increase the capacity of training recipients to influence policies, official norms, and regulations. Government officials and policy makers have diverse needs and may require approaches specifically aimed at increasing social, institutional, or leadership capacity (Jayatilaka, 2003), which they can then apply to reach sustainable goals in their own realm of influence. This can be a gateway to a broader audience and open opportunity windows for influencing decisions regarding the SDGs.

Practical outputs of training courses and follow-up support

In order to adapt capacity-building activities to local needs, the case study organizations highlight the importance of designing training courses to be applicable to participants' real-life on-the-ground efforts as much as possible. A single capacity-building event or activity may not always be enough to make impactful change. For example, ELTI's follow-up support helps participants further develop their capacity to apply what they learned at an initial training event by helping them form community groups, apply for external funding, train others in their community, and implement restoration projects on-the-ground. Combining practical training courses with follow-up support can create a ripple effect for participants to implement and share what they learn, thereby enhancing their potential for making impactful change in land management.

Additionally, the outcomes of capacity-building events, such as exercises and assignments in courses, can also become part of broader strategies, where active networks of collaborators can contribute to joint projects with regional or national scope. For example, RM's practice of having forestry students prepare proposals for a contest could be turned into a sustainable business venture. Similarly, many of ELTI and PV's courses require participants to create personal projects relating the course material to their specific context. The type of output they develop during the course depends on the type or target audience for a given course. For example, courses for landholders may require participants to develop farm plans, whereas midlevel practitioners and decision-makers may be asked to develop management or training plans.

One challenge that these organizations have encountered has been finding mechanisms for alumni engagement, in order to facilitate continued exchange among individuals after a training course is completed. For example, participants of ELTI and PV's courses have expressed interest in networking and continued learning after participating in specific events. However, participants do not always have the time to invest in further engagement, or there may not be convenient and useful mechanisms to do so. Additionally, though the organizations recognize the important role that continuous follow-up support can play in advancing SLM, the demand for this support can sometimes go beyond individual organizations' financial resources and staffing capacity.

Monitoring, evaluation, and adaptive management

As with any component of sustainable development, it is extremely important that capacity-building organizations conduct monitoring and evaluation for their activities and results to ensure that they are suitably achieving program objectives, as well as to allow for adaptive management and adjusting program strategies over time (Connolly & York, 2002). For example, RM added their Young Forest Entrepreneur program to their agenda after evaluating their organizational approach and discovering the opportunity that empowering and developing the entrepreneurial skills of university students could have in advancing sustainable development in Mexico. Similarly, after ELTI's first 5 yr of delivering field courses in many countries on different themes, this initiative decided to

focus the majority of their field-training events in areas where a set of course curricula could be repeated within a network of "focal training sites." These field sites include interpretive trails, demonstration areas, field exercises, and farm visits that can be used for a range of courses with different audiences. This approach enabled the program to focus its limited resources within a few locations and countries vs. implementing courses in a range of locations throughout the tropics.

The authors believe it is important to carry out a monitoring and assessment strategy that can evaluate the outcomes of capacity-building efforts over the medium and long term, as well as identify impacts of projects implemented by former course participants. The results of such assessment could improve the methods and scope of the capacity-building activities and give insight into new strategies for influencing national and local restoration practices and policies. While the organizations featured in this article have been evaluating their own activities in different ways, they all identified monitoring and evaluation as a key area for growth and improvement. One of the major challenges that the organizations face is determining the most efficient, cost-effective, and feasible approach to reaching past recipients of capacity-building support to gather information on results over time. Similarly, the organizations struggle with how to obtain the resources to conduct impact evaluations of their capacity-building efforts.

Conclusions

Overall, there are many tools and approaches that can be used to build local capacity for SLM and thereby advance the SDGs. As highlighted by the results of a 2016 workshop, and the three organizations working in the field described in this article, capacity building can help give diverse stakeholders the technical knowledge and abilities to implement projects. Additionally, capacity building can be used to advance social, institutional, or organizational capacity to influence policy and decision-making, develop international networks, and help individuals to develop "soft" skills, such as leadership, project management, or entrepreneurship. The authors' recommendations for organizations seeking to get involved in capacity building for the SDGs include the following:

- Capacity-building activities and educational materials should be tailored to local needs and contexts.
- Because of limited resources and widespread capacity-building needs, target audiences can be selected by determining what groups could best serve as leaders, trainers, or amplifiers of the information. In some cases, there is great potential of training young people to become those agents of change in their community.
- Organizations involved in capacity building can benefit from strategic alliances with key partners that play a role in identifying training needs, delivering content, providing expertise, organizing activities, and other aspects of capacity building.
- Instead of just providing information, courses can have greater results if they are designed to maximize the applicability of information and assignments to real-life efforts in which participants are involved.

- Follow-up support after training opportunities is very important to help participants succeed in achieving their goals.
- Monitoring efforts should be used to evaluate the capacity-building tools and approaches and engage in adaptive management of the programs over time.

Capacity building will be a crucial element of determining the success and realization of the SDGs, and we hope that the synthesis of case studies presented here can serve as a valuable guide for the development of diverse capacity-building initiatives required to meet the United Nations SDGs.

Acknowledgments

The authors would like to thank the Yale Chapter of the International Society of Tropical Foresters (ISTF) for their support as well as the participants of the Capacity Building Workshop held at 2016 ISTF conference for their valuable insight into capacity building and sustainable development. We thank Dr. Eva Garen, Director of the ELTI, for her input on the themes and discussion points held during the workshop.

Funding

We thank Arcadia, INECOL, NatureServe, American Forests, US Fish and Wildlife Service Neotropical Migratory Bird Conservation Act, Mexico's *Comisión Nacional Forestal*, and the *Fondo Ambiental Veracruzano* for providing funding or technical advice for capacity-building activities featured in this article.

ORCID

Ernesto Ruelas Inzunza http://orcid.org/0000-0001-7651-5308

References

Bande, M., Labastilla, P., Consunji, H., & Bloomfield, G. S. (2015). *Rainforestation case study, environmental leadership and training initiative*. Leyte, Philippines: Visayas State University.

Beh-Miss, E. A., Martínez, J. C., & Rodríguez, S. (2016). *Competencia de los ingenieros forestales*. Distrito Federal, Mexico: Reforestamos México, International Union of Forest Research Organizations.

Blaser, J., Sarre, A., Poore, D., & Johnson, S. (2011). Status of tropical forest management 2011. ITTO Technical Series No 38. International Tropical Timber Organization, Yokohama, Japan.

Bloomfield, G. S. (2016). Online capacity building: New tools and strategies for distance learning. In L. Dávila, G. S. Bloomfield, & Z. Calle (Eds.), *Symposium on strategies and innovations necessary for capacity building on ecological restoration* (pp. 39–47). Environmental Leadership and Training Initiative. New Haven, CT: Yale University.

Bolger, J. (2000). Capacity development: Why, what and how. *Canadian International Development Agency (CIDA) Policy Branch*, *1* (1), 9.

Bray, D. B., Merino-Pérez, L., & Barry, D. (2007). *Los bosques comunitarios de México*. Distrito Federal, Mexico: Instituto Nacional de Ecología.

Calle, Z., Murgueitio, E., Chará, J., Molina, C. H., Zuluaga, A. F., & Calle, A. (2013). A strategy for scaling-up intensive silvopastoral systems in Colombia. *Journal of Sustainable Forestry*, *32*, 677–693. doi:10.1080/10549811.2013.817338

Ceccon, E., Barrera-Cataño, J. I., Aronson, J., & Martínez-Garza, C. (2015). The socioecological complexity of ecological restoration in Mexico. *Restoration Ecology*, *23*, 331–336. doi:10.1111/rec.12228

Cicin-Sain, B., Knecht, R. W., & Fisk, G. W. (1995). Growth in capacity for integrated coastal management since UNCED: An international perspective. *Ocean Coast Managed*, *29*, 93–123. doi:10.1016/0964-5691(96)00028-2

Comisión Nacional Forestal para América Latina y el Caribe (COFLAC). (2015). *Informe vigésima novena reunión*. Rome, Italy: UN Food and Agriculture Organization.

Comisión Nacional para el Conocimiento y Uso de la Biodiversidad (CONABIO). (2014). *Quinto informe nacional de México ante el Convenio sobre la Diversidad Biológica (CDB)*. Distrito Federal, México: CONABIO.

Connolly, P., & York, P. (2002). Evaluating capacity-building efforts for nonprofit organizations. *OD Practitioner*, *34*, 33–39.

Consejo Nacional de Evaluación de la Política de Desarrollo Social (CONEVAL). (2013). Valoración de la información de desempeño presentada por el programa. ProÁrbol.-Pago por Servicios Ambientales. *Informe de la evaluación específica de desempeño 2012–2013*. Comisión Nacional Forestal. SEMARNAT. Distrito Federal, México.

Corbin, J. D., & Holl, K. D. (2012). Applied nucleation as a forest restoration strategy. *Forest Ecology and Management*, *265*, 37–46. doi:10.1016/j.foreco.2011.10.013

Diario Oficial de la Federación (DOF). (2005). *Reglas de operación del programa proÁrbol-2006*. Distrito Federal, México: Secretaría del Medio Ambiente y Recursos Naturales.

Diario Oficial de la Federación (DOF). (2013). *Reglas de operación del programa proárbol-2009*. Distrito Federal, México: Secretaría del Medio Ambiente y Recursos Naturales.

Diario Oficial de la Federación (DOF). (2015). *Acuerdo por el que se establecen las reglas de operación del programa de conservación pra el desarrollo sostenible*. Distrito Federal, México: Secretaría del Medio Ambiente y Recursos Naturales.

Eade, D. (1997). *Capacity-building: An approach to people-centered development* (pp. 30–39). Oxford, UK: Oxfam UK and Ireland.

Garen, E. (2014). ELTI: Strengthening capacities for ecological restoration in Latin America. In A. Calle, Z. Calle, E. Garen, & A. Del Cid-Liccardi (Eds.), *Symposium on ecological restoration and sustainable agricultural landscapes* (pp. 34–38). Environmental Leadership and Training Initiative. New Haven, CT: Yale University.

Garen, E., Saltonstall, K., Slusser, J. L., Mathia, S., Ashton, M. S., & Hall, J. S. (2009). An evaluation of farmers' experiences planting native trees in rural Panama: Implications for reforestation with native species in agricultural landscapes. *Agroforestry Systems*, *76*, 219–236. doi:10.1007/s10457-009-9203-4

Global Environment Facility (GEF). (2016). Sustainable land management and its relationship to global environmental. *Benefits and Food Security – A Synthesis Report for the GEF*. (GEF/STAP/C.50/Inf.03). p. 9.

González-Espinoza, M., Ramírez-Marcial, N., Galindo-Jaimes, L., Camacho-Cruz, A., Golicher, D., Cayuela, L., & Rey-Benayas, J. M. (2009). Tendencias y proyecciones del uso del suelo y la diversidad florística en los altos de Chiapas, México. *Investigación Ambiental*, *1*, 40–53.

Gordon, J., & Chadwick, K. (2007). Impact assessment of capacity building and training: Assessment framework and two case studies. *Impact Assessment Series Report No. 44*, February 2007.

Hernández Melchor, G., Sol Sánchez, Á., Ruiz Rosado, O., Valdez Hernández, J., López Collado, J., & Reta Mendiola, J. (2016). Diagnóstico del proceso de reforestación en manglares de la costa de Tabasco. *Revista Mexicana De Ciencias Agrícolas*, *0*, 2883–2894.

Holl, K. D., & Aide, T. M. (2011). When and where to actively restore ecosystems? *Forest Ecology and Management*, *261*, 1558–1563. doi:10.1016/j.foreco.2010.07.004

Índice de Competitividad Forestal Estatal (IcoFE). (2014). *Reforestamos México*. Distrito Federal, Mexico: Instituto Mexicano de la Competitividad.

IRMP. (2003). *Capacity building for community based environmental management*. Colombo, Sri Lanka: Central Environmental Authority/ARCADIS.

IUCN & WRI. (2014). A guide to the restoration opportunities assessment methodology (ROAM): Assessing forest landscape restoration opportunities at the national or sub-national level. *Road-test edition*, Gland, Switzerland: IUCN. p. 125.

Jayatilaka, W. (2003). Capacity building for sustainable development. *Journal of the National Science Foundation of Sri Lanka*, *31*, 81–97.

Linding-Cisneros, R. (2010). Ecological restoration in Mexico: The challenges of a multicultural megadiverse country. *Ecological Restoration*, *28*, 232–233. doi:10.3368/er.28.3.232

Neidel, J. D., & Consunji, H. (2011). Rainforestation: Scaling up native species reforestation in the Philippines. *SERNews, Society for Ecological Restoration*, *25*, 1–5.

Neidel, J. D., Consunji, H., Labozetta, J., Calle, A., & Mateo-Vega, J. (Eds.). (2012). *Mainstreaming native species-based forest restoration*. ELTI Conference Proceedings. New Haven, CT: Yale University.

Nelles, W. (2011). Environmental education, sustainable agriculture, and CGIAR: History and future prospects. *Comparative Education Review*, *55*, 398–423. doi:10.1086/659341

Organization for Economic Co-operation and Development (OECD). (2006). The challenge of capacity development: Working towards good practice. *DAC Guidelines and Reference Series*, p. 46.

PNUD. (2016). Restaurando los manglares en el Pacífico de Guatemala. Retrieved March 1, 2017, from http://www.gt.undp.org/content/guatemala/es/home/presscenter/articles/2016/03/13/restaurando-los-manglares-en-el-pac-fico-de-guatemala.html

Rao, M., Johnson, A., Spence, K., Sypasong, A., Bynum, N., Sterling, E., … Praxaysombath, B. (2014). Building capacity for protected area management in Lao PDR. *Environmental Management*, *53*, 715–727. doi:10.1007/s00267-014-0235-9

Slusser, J. L., Calle, A., & Garen, E. (2015). Sustainable ranching and restoring forests in agricultural landscapes, Panama. In N. Pasiecznik, & H. Savenije (Eds.), *Effective forest and farm producer organizations* (pp. 31–38). Wageningen, the Netherlands: Tropenbos International.

United Nations (UN). (2012). Resolution adopted by the General Assembly on 11 September 2012. *A/RES/66/288 The future we want*.

United Nations (UN). (2014). *New York Declaration on Forests*. Retrieved from http://www.un.org/climatechange/summit/wp-content/uploads/sites/2/2014/07/New-York-Declaration-on-Forest-%E2%80%93-Action-Statement-and-Action-Plan.pdf

United Nations (UN). (2015). Resolution adopted by the General Assembly on 25 September 2015. *A/RES/70/1 Transforming our world: The 2030 Agenda for Sustainable Development*.

United Nations Convention to Combat Desertification (UNCCD). (2016). *A natural fix: A joined-up approach to delivering the global goals for sustainable development* (p. 52). Bonn, Germany: UNCCD.

United Nations Environment Programme (UNEP). (2002). *Capacity building for sustainable development: An overview of UNEP environmental capacity development activities* (p. 163). Nairobi, Kenya: UNEP.

United Nations Framework Convention on Climate Change (UNFCCC). (2015). *Adoption of the Paris Agreement* (Report No. FCCC/CP/2015 /L.9/Rev.1). Retrieved from http://unfccc.int/resource/docs/2015/cop21/eng/l09r01.pdf

Universidad Autónoma Chapingo (UACH). (2010). Evaluación externa de los apoyos de reforestación. *Ejercicio Fiscal 2009*. Texcoco, México: Universidad Autónoma Chapingo, SEMARNAT, CONAFOR.

Wollenberg, E., Merino, L., Agrawal, A., & Ostrom, E. (2007). Fourteen years of monitoring community-managed forests: Learning from IFRI's experience. *International Forestry Review*, *9*, 670–684. doi:10.1505/ifor.2007.9.issue-2

Zaldívar-Jiménez, M. A., Herrera-Silveira, J. A., Tutli-Hernández, C., Compin, F. A., Andrade, J. L., Coronado, M. C., & Pérez, C. R. (2010). Conceptual framework for mangrove restoration in the Yucatán Peninsula. *Ecological Restoration*, *28*, 1543–4079. doi:10.3368/er.28.3.333