ECOSYSTEM MANAGEMENT AND RESTORATION

Combating Disasters by Protecting Ecosystems Using a Landscape Approach

PARTNERS FOR RESILIENCE

On the cover: A volunteer tends to mangrove propagules in Barangay Cagsao in the municipality of Calabanga, Camarines Sur. (Jes Aznar, ACCORD)

Ecosystem Management and Restoration

Combating disasters by protecting ecosystems using a landscape approach

Houses along the banks of Agusan River in Talacogon, Agusan del Sur are built on bamboo rafts for ease of transportation and as an adaptation measure to rising floodwater during the rainy season. (Ma. Bernadette Uy, ACCORD)

I. INTRODUCTION

When Typhoon Monang battered the coastal village of Sabang in 1993, massive swells from the ocean engulfed houses near the shore and killed scores of residents. One local recalls fleeing her home under the heavy downpour together with her cousin, and losing grip of the other girl as raging flood waters swept them away. Her cousin was found dead the next day. This grim episode in the villagers' collective memory has left them fearful of news of approaching storms.

Preventing such tragedies was ACCORD's mission in Calabanga, a municipality in Camarines Sur that is home to 11 storm surge-prone coastal villages, one of which is Sabang. This was done by implementing a Disaster Risk Reduction (DRR) program complemented by an Ecosystem Management and Restoration (EMR) strategy.

This approach requires the active and meaningful participation of local communities. Empowering them to become active participants rather than victims means equipping them with the proper tools to assess their risks and vulnerabilities, and guiding them through capacity trainings and education. This will help them plan courses of action that are well-adapted to existing hazards and their own social context. Incorporating EMR into the process will augment the overall results of the program, for instance, by creating healthier ecosystems which may decrease disaster risks in both coastal and upland communities and also contribute to creating sustainable livelihood opportunities.

ACCORD supported building the capacity of residents against climate and disaster risks while mainstreaming the protection and management of natural resources in communities that are located near the shores and in upland areas. Part of its DRR program in Barangay Sabang is the introduction of mangrove reforestation as a small-scale mitigation measure to help reduce the adverse impacts of disasters in this time of anthropogenically-induced climate change.

A similar approach of rehabilitating ecosystems to complement disaster risk reduction and management was introduced in barangays and municipalities of Davao de Oro and Agusan del Sur. ACCORD and CARE implemented EMR activities such as riparian reforestation using indigenous tree species, slope erosion mitigation, and tree planting in portions of the upper Agusan River basin, and the Agusan Marsh.

Years after the implementation period of the projects described in this study – one project was launched in 2009 and the other, in 2015 – ACCORD continues to nurture ties with these communities and link them with opportunities for capacity building. The communities have also been able to sustain their EMR efforts.

II. STRATEGIES

Integrated Risk Management (IRM) approach as foundation to building resilient communities

The environment and disasters are inherently linked. In most cases, the natural world is perceived as causing disasters, whose impacts are mediated by a community's exposure to hazards and its capacities and vulnerabilities. But human activity that degrades the environment likewise aggravates disaster risk. It is a mutually reinforcing relationship: while ecosystem degradation may affect the frequency and severity of disasters, frequent and severe disasters also gravely affect the health of the ecosystem.

On the premise that the unsustainable use and abuse of natural resources and the environment contribute to high disaster risks, curbing abuse while promoting sustainable use and nature-based solutions can therefore contribute to disaster risk reduction (ACCORD Inc.). Successful ecosystem management and restoration can diminish the impacts of natural hazards while contributing directly to poverty alleviation, sustainable development, and the achievement of the Millennium Development Goals (UNEP). It can also contribute significantly to disaster risk mitigation and recovery from disaster impacts.

The application of ecosystem-based measures through a landscape approach can help address underlying risk factors and mitigate future disaster impacts. This transformative approach examines the whole landscape, for instance, by looking at not just a watershed but also its tributaries. It considers interactions within local environments and ecosystem connectivity. It also looks into the impacts of human activities on ecosystem services.

Noting the importance of integrating efforts in DRR and Climate Change Adaptation (CCA) with ensuring sustainable ecosystem services, ACCORD's project in Calabanga initially undertook a DRR-CCA approach, with a special focus on natural resource management (NRM). The project was initiated in 2009 to reduce disaster risk by identifying hazards (flooding, storm surges, and erosion) and vulnerability (due to unsustainable management) and proposing measures to increase disaster preparedness (e.g., early warning). Specifically, it involved revegetation and natural farming to reduce the risk of erosion and inland flooding, revegetation of coastal forests to buffer against storm surges and coastal flooding, supporting the protection of marine sanctuary, and the development of sustainable and resilient fisheries to increase the resilience of local livelihoods.

Building on this initiative, ACCORD and CARE, working with four other organizations in a consortium, embarked on another project incorporating DRR and CCA with an environmental outlook in 2015. Using EMR as a framework for development, the program was redesigned to incorporate sound technical input and public awareness strategies focused on the partner communities. The Proud of my Purok Project (PoMP) was implemented in two provinces – Agusan del Sur and Davao de Oro – specifically, in four municipalities and 20 barangays located in the Agusan River Basin. ACCORD and CARE were responsible for implementing the project in 10 barangays in Maragusan municipality, Davao de Oro, and in Talacogon municipality, Agusan del Sur. The goal was to strengthen the communities' resilience to disasters by addressing underlying vulnerabilities while taking into account DRR, CCA, livelihood, and landscape and ecosystem opportunities.

Today, the holistic approach that combines DRR, CCA, and EMR is called Integrated Risk Management (IRM) by ACCORD, CARE, and other non-government organizations operating in the Philippines and in several other countries.

Reaping the benefits of healthy, well-functioning ecosystems

In Barangay Sabang, the swamp where a thriving mangrove forest now stands was previously an expanse of abandoned fishponds. Residents recall that, more than 50 years ago, rows of mangroves encircled their coastlines. As the demand for fuel increased in the following decades, the mangroves were chopped down for firewood. The unregulated cutting of mangroves, aggravated by the conversion of waterways into fishponds, led to the plunge in mangrove population and the subsequent weakening of the local community's protection from tsunamis, storm surges, land erosion, and coastal flooding.

Lush mangrove forest in Sabang, Calabanga in Camarines Sur Province provides much-needed protection from strong winds and water during typhoon season. The mangrove forest also serves as a breeding ground for various fish and sea creatures, which residents catch as a source of livelihood

The restoration and protection of mangrove forests in the coastal towns of Calabanga is a coastal protection strategy which, at the same time, yields valuable ecosystem services. The rehabilitated mangrove forest serves as a barrier against floods and storm surges, and residents of Barangays Sabang, Cagsao, and Balatasan say that inland flooding brought by recent storms has become less intense. This is because the rush of floodwater is hampered by the intertwining roots of mangroves. Massive soil erosion has also been moderated especially in Barangay Cagsao, where ACCORD introduced mangrove reforestation and the installation of gabions as breakwater.

According to Barangay Sabang's Mangrove Project Management Team (PMT), the group of local volunteers who tend to the mangroves, the forests help mitigate saltwater intrusion to nearby agricultural barangays, thus preventing damage to crops. They add that, once their mangrove forests were established, a boom in the population of marine species was noticeable, with mud crabs and a variety of fish now calling the roots of the mangroves home. The forests also serve as a sanctuary and breeding ground for freshwater species. These days, villagers say their waters teem with small fish and their shores even play host to the occasional butanding, or whale shark.

A clearer view of risk by integrating knowledge from scientists and local communities

Conducting a well-designed risk analysis and action planning lays down the blueprint for an effective DRR program tailored to the specific needs of partner communities. Community risk assessments analyzing the context of the communities' hazards, vulnerabilities, and capacities were completed with the participation of community members.

Volunteers and community members of Barangay Cagsao during a mangrove planting activity in 2011. Some of the mangroves they planted almost a decade ago did not survive, but they have replaced them with better variants and continued efforts to maintain what remained.

For PoMP, participatory risk assessments were conducted in project barangays and municipalities using an integrated tool box (ITB), a collection of nine tools for assessing and analyzing risks. The ITB is an enhancement of the traditional DRR risk assessment tools to systematically incorporate climate change and ecosystem restoration and management elements.

Aside from community risk assessments, landscape risk assessments were carried out to cover the scope of the project, which considers the contiguous zones along the Agusan River Basin. A landscape risk assessment covering the whole Agusan River Basin was produced, integrating indigenous and scientific knowledge. Results from both the landscape risk assessment and community risk assessments from the participating barangays and municipalities were then integrated to provide comprehensive risk information.

PoMP introduced an innovative format for preparing the risk assessment reports wherein data were organized according to the government's development planning sectors – social, economic, physical, environmental, and institutional. This way, the relationship between disaster risk and development needs can easily be established and considered both in development planning and in risk reduction planning. This method veers away from the conventional reporting practice of presenting a collection of rough outputs of risk assessment tools such as hazard maps and capacities and vulnerabilities matrices.

Mangrove propagules planted along the shores of Barangay Cagsao in Calabanga, Camarines Sur. Before planting them, volunteer and community members were organized into project management teams and took trainings on how to properly sow and take care of the seedlings. (Jes Aznar)

DRR, CCA, and EMR plans were then developed based on the results of the risk assessments. The restoration plans were based on scientific data and participatory processes in mapping suitable locations: the size and locations of possible restoration areas were based on satellite-images, ground-truth data, and recommendations provided by consortium partners, while the validation and selection of the proposed areas were then conducted through consultations with the community.

Helping community members become champions of resilience

To guarantee that the course of development will favor the community, the participation of local community members is crucial. They can provide valuable insight on the risks, capacities, and vulnerabilities within their communities, and it is their right to have their voices heard in conversations about matters that will affect them. Moreover, encouraging their active participation engenders within them a sense of ownership over the program, and will help ensure the sustainability of project actions perhaps even beyond the period of implementation. Thus, it is important to build and strengthen community capacities so that they are better able to participate.

ACCORD's projects involve partner communities first-hand in the planning process. The direct engagement of community members in developing IRM programs can take the form of consultations, trainings, workshops, and public awareness activities. ACCORD likewise helps strengthen local capacities by engaging with the local government, academe, and civil society, and fostering partnerships across these sectors.

Protecting our village, securing our future

With bounce in their strides, the small group of volunteers forming the Mangrove Project Management Team (PMT) made their way to their mangrove forest near the beach front in Barangay Sabang. They came prepared with their bolos, boots, and stories to share. For them, tending to the mangroves is not just a job; it is a regular social event where they can touch base with fellow volunteers who share the same commitment to raising healthy mangroves for the benefit of their community and their children.

The members of the PMT of Barangay Sabang are long-time volunteers of ACCORD coming from different zones of the village. They took active roles in disaster preparedness trainings, crafted their disaster contingency plan, and participated in community and earthquake drills. Some of them are even committee heads of their Barangay Disaster Risk Reduction Management Council. One woman proudly shared that, as a member of the early warning system committee, she helps monitor incoming storms. Once a storm signal is raised, she runs toward their bell to alert neighbors, and signal for evacuation if the storm has high intensity.

The group helped plant the mangroves along their coast in 2009, and today remains active in looking after them. The team regularly visits the area to inspect the trees, remove harmful insects, and take out dead leaves and trash. The PMT as primary caretakers have passed down their deep appreciation of their mangroves to their children, and let the kids accompany them in their monitoring and cleanup rounds. "We know that we are not getting any younger, so we teach them how to take care of the mangroves, knowing that the time and energy we spend tending to them are an investment in our children's future," one caretaker said. They vow to continue caring for the mangroves as long as they live, and are confident that the young ones will continue protecting the mangroves after they are gone.

Though the municipality's budget only allows for six caretakers in Barangay Sabang, the PMT has collectively decided to split the total allowance among their 16 active members. They are vocal in their appreciation that, beyond the meager monetary compensation, the bond they share has deepened through years of working together. They add that, despite the hardships and sacrifices, their commitment remains unwavering. Today, their labor of love has not been in vain as their forest of kuyapi, nipa, and bakaw trees stand steady, like a guardian watching over their village.

Members of the Mangrove Forest Project Management Team in Barangay Sabang, Calabanga. The group has been taking care of the mangroves – cleaning, planting, and keeping out loggers – for about a decade now.

Strengthening institutional support to promote sustainability

Building institutional capacities in DRR and EMR includes ensuring that institutional policies and structures are in place to deliver services. Governments can support resilience measures through policies and programming grounded on ecological integrity and disaster resilience. Oftentimes, government units, schools and research bodies, and other institutions have resources that can be made accessible to communities through technical assistance on engineering, agriculture, and environment management. Mobilizing these support mechanisms at the very start of implementation and throughout the project's lifecycle may help in ensuring project adaptability and sustainability.

Environmental governance was introduced in Calabanga when mangrove forests were protected for the purpose of mitigation against storm surge, flood, and shoreline erosion. Resource management was practiced through mechanisms such as monitoring and regular documentation of the state of mangrove areas, training of caretakers, and allotment in the local budget. Regulations against the chopping down of mangroves are in place and enforced. Such moves toward protecting the integrity of coastal ecosystems is a testament to the municipality's political commitment to protecting the environment and their appreciation of the role of ecosystem management and restoration in reducing disaster risk.

Facilitation of inter-sectoral coordination and dialogue between the users and producers of scientific information will enable more fruitful connections between informers and decision makers. DRR programming entails coordination with varied bureaus of the government such as the Department of Agriculture, as well as with civil society. Partnerships with the academe started with mangrove reforestation as an outreach activity of colleges and universities in the Bicol region, and the mangrove areas as study sites for research.

The municipality of Calabanga as a model of disaster resilience

"Favorably changing people's perspectives when it comes to matters that, on the surface, they do not get immediate rewards from" – this is what Mayor Eduardo Severo believes ACCORD's program has accomplished in the municipality of Calabanga. Before holding public office, he was a community facilitator in ACCORD projects and participated in several Disaster Risk Reduction (DRR) trainings, contingency planning, and community drills. He added that ACCORD has been integral to bridging local government, barangay council, and communities in a concerted effort of fostering a culture of safety among their constituency.

For its exemplary work in mainstreaming DRR in its policies and regulations, the municipality of Calabanga was conferred the National Gawad Kalasag, a recognition given to local government units that exhibited good practices in disaster risk reduction. The municipal government has been incorporating DRR activities in the Executive Legislative Agenda and allocating funds for these activities as well as for the replication of the project in other barangays. In 2011, the municipality embarked on mainstreaming DRR in the Rationalized Planning System. DRR and solid waste management topics were also included in regular orientation programs for newly-elected barangay officials (ACCORD, 2012).

Taking inspiration from their concerted work in mangrove reforestation, Severo said they hope to continue this legacy as they were able to replicate ACCORD's mitigation project in Barangay Belen. They also shared their knowledge with neighboring municipalities as they embarked on incorporating a landscape approach in environmental management along San Miguel Bay.

Community-led efforts in revitalizing their ecosystem were supported by NGOs, the private sector, and other stakeholders. Barangay Cagsao, similar to other coastal barangays in Calabanga, partnered with organizations and businesses like SMART, in learning more about mangrove reforestation and management.

Similar strategies were adopted through PoMP in Agusan del Sur and Compostela Valley. In PoMP, ACCORD and its implementing partners engaged several puroks, or districts, and relevant government bodies, including the Agusan River Basin Governing Board, in addressing the underlying factors and causes of risks. Resolutions adopting the barangay Disaster Risk Reduction and Management Plans (DRRMP) that incorporated IRM principles were approved and adopted by local barangay councils. PoMP also supported local government units (LGUs) in developing their DRRMPs, Local Climate Change Action Plans (LCCAP), and mainstreaming IRM in local development planning processes.

The community also played a vital role in pushing for better institutional support, as seen in cases where communities openly asserted their rights to a healthful ecology through the adoption of policies and programs focused on environmental conservation, restoration, protection, and management. For instance, in Barangay La Flora in Talacogon, Agusan del Sur, the restoration site was declared a "reserved forest" or protected area, and in Barangay Tigbao in Maragusan, Compostela Valley, policies that prohibit the further conversion of land into banana plantations were implemented.

III. CHALLENGES

The ACCORD project in Calabanga, which initially covered only one barangay, was expanded to cover nearby coastal villages and, later on, upland barangays. Early attempts in mangrove reforestation, however, faced major setbacks.

For one, the timeframe set for the mangrove reforestation project overlooked the potential impacts of the incoming typhoon season. Mangrove saplings were washed out because they were planted in regularly flooded areas. Survival rate of the mangrove propagules were also negatively affected by successive tropical cyclones.

Technical input from the local environment and natural resources office and local knowledge from the community were considered in the selection of the species of mangroves to be planted. However, after a series of consultations, only two indigenous species were recommended for sites in Calabanga.

The results in upland project areas are weaker than those observed in coastal barangays. The original plan was to plant trees along eroded areas to prevent further soil erosion. However, the tree planting activity was undertaken with limited assessment, planning, and technical advice. Saplings were distributed to residents without the necessary guidance on where or how to plant them.

In partner barangays of PoMP in Agusan del Sur and Compostela Valley, tree-planting activities were implemented as part of the restoration project and will also be conducted annually as part of the BDRRM plans of the barangays. During site selection, a major challenge was that most of the riparian riverbank zones were privately claimed or zoned lands.

An overarching challenge is that mangrove ecosystems and other EMR efforts that the communities and local governments have undertaken are constantly threatened not only by natural hazards but also by infrastructure development programs, extractive industries, and other human activities.

A resident from Barangay Balatasan in Calabanga holds a bundle of propagules, or mangrove seedlings, that they will plant along their shore. Similar to other coastal barangays in the municipality, most residents rely on fishing-related activities as their main source of livelihood. (Jes Aznar)

As early as 2009, the disaster risk reduction and food security projects in Calabanga already had activities employing what is now called the landscape approach. In the picture, municipal staff and community members plant trees in upland areas to protect mangrove forests downstream. According to their analysis, the deforestation in upland areas contribute to flooding and sedimentation downstream that lead to the destruction of mangroves and sea grass. (Ciriaco Santiago III, CSsR)

IV. LESSONS LEARNED

Harvesting valuable insights from ACCORD's IRM projects

Experiences in Calabanga and PoMP in Agusan del Sur and Compostela Valley showed that the combination of bottom-up and top-down approaches is key to effective implementation. In these projects, ACCORD complemented its disaster risk reduction strategy with local capacity building, awareness and education activities, and organizing at the community level, thereby making it easier to involve and foster ownership of the project among stakeholders.

Advocacy work at the LGU level is equally important. Moreover, engaging in joint or integrated efforts and clinching political and public commitment in DRR are essential in ensuring fruitful collaborations between stakeholders and sustaining the gains from these initiatives. With enough momentum gained from previous intervention, replication of the program in other sites was initiated by stakeholders on their own.

The use of combined participatory and scientific tools in developing landscape and community risk assessments was helpful in guiding communities in the analysis of their situation. Looking into the wider landscape and the deeper causes of vulnerabilities resulted in a better appreciation of the risks involved and provided a sound basis for planning. In PoMP, there was an observation that it was useful to present the community risk assessment reports in a format that easily highlights the links of disaster risks to development planning. It is important to note that the risk assessment reports tend to include a large volume of data, some of which are non-essential to risk assessment, and which may take the focus away from the actual purpose of the report, so care must be taken in refining the results of the assessment reports.

The EMR projects benefitted from integrating participatory processes and consulting scientific experts from research and academic institutions. Combining both approaches provides a more comprehensive view that could aid the identification and mapping of locations for restoration, and the selection of suitable endemic species for planting.

Proper timing and strategizing were also considered in planning and implementing the subsequent mangrove reforestation activities to account for typhoon season and the susceptibility of planting sites to flooding.

V. CONCLUSION

Successful restoration of ecosystems can protect lives and livelihoods.

The mangrove reforestation in the coastal towns of Calabanga, and riverbank restoration by tree planting in Compostela Valley and Agusan del Sur, illustrate the link between EMR and DRR. As part of EMR strategy, the adoption of a landscape approach allowed for a more comprehensive view of the local context, from upland areas down to the coastlines. Such a holistic understanding of the existing risks, capacities, and vulnerabilities will help strengthen the disaster preparedness of communities. In addition, restored mangrove and riparian forests provide valuable services, such as acting as storm surge barriers and anti-flood buffers. Aside from building safer communities, the public may benefit from jobs, economic value, and associated services from the restoration of resources.

Integral to the protection of these benefits are people and institutions: community stewardship and local government's institutionalization of environmental safeguards will ensure that ecosystems will remain protected and, in return, continue to provide services to the communities.

In essence, the IRM approach – the integration of DRR, CCA, and EMR – provides an opportunity to address the underlying causes of vulnerabilities, may help lessen the adverse impacts of hazards on local populations, and lays the foundations for more sustainable solutions.

More than ten years after the first batch of mangrove propagules were planted along the shores of Calabanga, the forest has grown so lush that project management team members now have to ride a boat during roving and monitoring.

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