EPIC EXTERNAL REVIEW

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Executive Summary

This report presents an evaluation of IUCN's Ecosystems Protecting Infrastructure and Communities (EPIC) project.

Chapter 1 describes the background and context to the project, providing a brief overview of climate change, Ecosystem-based Adaptation and Ecosystem-based Disaster Risk Reduction.

Chapter 2 provides more detail about IUCN's Ecosystems Protecting Infrastructure and Communities (EPIC), which is a five-year initiative that uses ecosystem-based approaches to protect communities from disasters and the negative impacts of climate change. It promotes the implementation of ecosystem-based disaster risk reduction (Eco-DRR) through five projects in Burkina Faso, Chile, China, Nepal, Senegal and Thailand.

EPIC uses a strategy that combines generating science-based knowledge; practising eco-DRR and ecosystem-based adaptation (EbA); influencing policy; and working with a range of stakeholders from grass-roots levels to the national level to achieve its results.

EPIC interventions ranged from strengthening local climate change adaptation strategies for floods and drought in Burkina Faso; quantifying and improving the protective capacity of forests against snow avalanches through modelling and positioning the Eco-DRR approach at multiple levels.; eco-engineering for landslide stabilisation using appropriate plant species in China; slope restoration and infrastructure planning to reduce landslides in Nepal; identifying nature-based measures against floods and salt intrusion in Senegal; and community-based ecological mangrove restoration for storm surges and other coastal hazards in Thailand.

An independent evaluation of the EPIC project was mooted to assess progress, performance, achievements and lessons learnt to date towards EPIC's overarching project goal stated at the beginning of this chapter. The evaluation addresses 1) *Relevance*: the extent the project objectives corresponded to beneficiaries' needs and to IUCN's programme priorities for EbA results on the ground, and nature-based solutions in policy; 2) *Effectiveness*: the extent of progress made towards the achievement of the outcomes and outputs of the project; 3) *Efficiency*: the extent to which the project been implemented according to budgets and agreed timelines, as well as good governance indicators; 4) *Sustainability*: whether measures have been put in place to ensure benefits after project closure; 5) *Impact*; the extent to which the conditions — at demonstration sites and in policy – are in place to enhance resilience and reduce vulnerability, while enhancing measurable ecosystem services, human well-being benefits and community governance.

Chapter 3 presents the methodology for the evaluation. Project documentation was reviewed and three site visits were made to Nepal, Senegal and Thailand. During these visits, semi-structured interviews were conducted with a range of key stakeholders and focus group discussions held with communities. For the rest of the countries, as well as well as EPIC global staff, a mix of Skype and email interviews were conducted. A total of 124 interviews were conducted. Logframes were developed to monitor progress of the project and SWOT

analyses carried out to summarise information in each logical framework. Answers to close-ended questions were coded for each country and analysed using Categorical Principal Component Analysis. Answers to open-ended questions were incorporated into the narrative as needed.

Chapter 4 presents the results of the evaluation.

The interviewees were grouped as follows for the analyses: Group1 — communities; Group 2 — IUCN country staff, implementing partners, government officers and others involved in the field; Group 3 — IUCN HQ staff (project management staff).

In general, with a few exceptions, those interviewed had similar responses to questions.

Results in terms of relevance:
1. When asked whether the project helped to reduce impacts of extreme weather events Group 1 overwhelmingly said yes;
2. When asked whether what was done through the project was what they and their family needed Group 1 overwhelmingly, said yes;
3. The logical frameworks presented in Annexes 5 -10 show that EPIC activities were clearly relevant to address ongoing climate-related issues in each country: bioengineering in slopes to reduce the impacts of landslides in China and Nepal; avalanche modelling in Chile; traditional innovations in Burkina Faso and Senegal to combat drought and soil salinisation, respectively and mangrove restoration in Thailand.
4. Considering project contributions to IUCN's EbA objectives, Group 3 felt that the objectives related to resilience of livelihoods. This does not relate to Chile where the focus was on a) the research component and b) in raising awareness on Eco-DRR and c) positioning the topic at multiple levels through multi-stakeholder dialogues. Nor does it apply to China, where, again, the focus was mainly on research and policy advocacy); reducing the impacts of natural disasters; capacity building and increasing awareness; and promoting sustainable management of biodiversity to maintain ecosystem services, had been largely met.
5. In relation to project contributions to the donor's policies Group 3 felt that objective had been met.
6. Considering the match between project objectives and beneficiaries' needs, for Burkina Faso, most of Group 2 felt that the match was between 81-90%; for Chile, 71-80%; for China 71-90%; for Senegal, 91-100% and for Thailand 71-80%.
7. Most the interviewees felt that the project was flexible in adapting to on-the ground changes, as well as being responsive to changing contexts and needs.

Results in terms of effectiveness:
1. In general, most proposed activities have been completed. In Burkina Faso, political unrest retarded effective progress.
2. The overall predicted outcome of the EPIC project has been largely met; with four out six countries meeting the output indicators for output 1; five out of six countries meeting indicator 1 for output 2, and all for indicator 2. Output 3, relating to multi-stakeholder dialogues (MSDs) has been successful in Chile, Nepal, Senegal and

Thailand. The other countries are on their way. However, private sector involvement in the MSDs, envisioned during project proposal development, is lacking in all countries.

3. Most of interviewees considered the EPIC project to be successful.
4. Group 1 felt that more technical support, capacity building and financial resources, as well as better site selection (Thailand) could have improved the project; while Group 2 felt that increasing the geographical ambit, injecting more funds, better site selection and involvement from the start of IUCN (China) and clarification of land rights was necessary for improvement. Group 3 had a range of recommendations such as better partnerships, more participatory actions, cost benefit analyses for all countries; increased overall budget and duration for the project and allocation of more staff time for implementing partners and country offices.
5. In terms of effectiveness in the approach in delivering the desired outputs, most of the responses were that the approach was effective.
6. In terms of the strategy used by EPIC of combining science, practice and policy, given different budgetary allocations, and different contexts, there were differences among the countries, with Nepal achieving an excellent balance of the three elements; China and Chile lacking practice but achieving high on science; yet others achieving high on policy (Chile and Thailand) while others (Burkina Faso and Senegal) achieved high on practice.

Results in terms of efficiency:
1. The evaluator did review the finances of the project as that was not part of her terms of reference. Initially, ProAct coordinated the EPIC project with IUCN but in 2014, ProAct's involvement in the EPIC project ceased. This led to a reallocation of the budget and subsequent delays. In Thailand, also, because of over-extension related to staff time by the implementing partner, there was a small reallocation of budget, otherwise, activities were generally carried out in time and according to budget allocation.
2. In terms of good governance indicators (consensus, participation, transparency, accountability, alignment with national laws) and gender balance, the project has fared well.
3. The roles of each player in the EPIC project have been defined generally: HQ staff provided oversight, and usually implementing partners effected actions on the ground and country office staff worked on policy advocacy.
4. Progress reports were due annually, and the only regular assessments were monthly Skype calls.

Results in terms of sustainability:
1. Most of interviewees responded that the project could be replicated.
2. In terms of scaling up, there was more variability in the responses, with a minority in Chile, China and EPIC global staff responding that scaling up was not possible or would be difficult. However, despite these opinions, EPIC has set the foundation to continuing working on Eco-DRR.
3. Responses to whether the project design was appropriate to the needs at every level —national, local, community — were largely affirmative, although there were some concerns as to whether the design was appropriate for the national level.

4. Communities in Burkina Faso and Senegal all said that they would continue interventions after the project had ceased. In Nepal, one of the three community leaders said that interventions would continue if there were more financial resources; and in Thailand, given the restricted land tenure of the two sites there were varied responses. Among Group 2, most of responses were that interventions will continue after the project ceases.
5. The general mechanism mooted by IUCN staff for continuation of activities is a phase II of the EPIC project. In Burkina Faso and Senegal, communities have not yet completely formulated a mechanism and believe that because they are motivated, the interventions will continue. In contrast, all three community leaders in Nepal plan to seek funding from the local government for continuation of their activities and there is also a community fund established in one village.

Results in relation to on-the-ground impacts of the project
1. What has been an unqualified success is the creation of awareness about nature-based solutions to climate change issues as most responded that there have been desired changes brought about in the behaviour of communities and government officers as a consequence of the EPIC project.
2. Much of the stated impact of EPIC project interventions remains yet anecdotal, with only Nepal providing sound-scientific evidence of the impact of interventions. Senegal will assess the impact of the EPIC interventions at the end of the project. It would have been better if, in all countries, baseline data of before and data after interventions has been collected for analysis.

Results in relation to policy influence the project
1. The impact of policy influence in Nepal, Chile and Thailand has been exceptional. In Senegal policy influence at the local level has also been very good, and ecosystem-based adaptation to climate change has been included in National Wetland Policy (2015). When asked whether there would be changes to policy because of the EPIC project most of responses for China were negative; while for Nepal, most hoped there would be changes. For the rest of the countries, most said yes.

SWOT analyses results revealed variations among the countries in terms of strengths, weaknesses, threats and opportunities.

Overall, dissemination about the learnings of the EPIC project, and the EPIC project itself has been good, but there is room for improvement.

The EPIC project, in its short duration of implementation, has yielded some valuable lessons learned. Chapter 5 lists these lessons.

Lesson 1: involving communities in identifying solutions leads to better community ownership. In Burkina Faso, Chile and Senegal, communities not only identified vulnerabilities to hazards but also presented solutions, using the Promoting Local Innovations (PLI) toolkit, to the identified issues. However, in the case of Chile, project lacked the enough resources to implement the identified innovations. In Burkina Faso and Senegal, traditional local strategies to cope with drought and salinisation, respectively, were identified and implemented successfully. *Recommendation 1: Ensure that in future projects*

on Eco-DRR and EbA, as well as in EPIC phase II, the PLI approach is used in all sites to ensure that the ownership of the project centres on communities.

Lesson 2: The approach used in EPIC of working with a range of stakeholders from grass-roots levels to the national level achieves results. In Senegal, EPIC has been instrumental in catalysing the formulation of a local level disaster risk reduction plan through COMRECC, the first of its kind in Senegal. In Chile, level biosphere reserve and national-level stakeholders are now more aware of the benefits of ecosystem-based approaches to DRR and climate change adaptation, and the need for managing ecosystems sustainably. In Nepal and Thailand, the EPIC project has achieved an excellent balance of working with a range of stakeholders. *Recommendation 2: Ensure that in future projects on Eco-DRR and EbA, as well as in EPIC phase II, this approach of working with a range of stakeholders is applied diligently across all sites.*

Lesson 3: investing in capacity building across the range of stakeholders brings valuable dividends. The EPIC project has been very effective in raising awareness across the range of stakeholders with whom the EPIC worked. In all countries, workshops were held to raise awareness of local stakeholders on climate change and disaster risks in their area, and nature-based approaches to respond to those risks. In addition, capacity-building workshops have also been held to train communities. As a consequence, in Chile, China, Nepal and Thailand, the concept of eco-DRR has now been accepted and is in the national governments' lexicons. In Burkina Faso and Senegal, the concepts of Eco-DRR and EbA have been absorbed into the local and regional governments. *Recommendation 3: Ensure that in future projects on Eco-DRR and EbA, as well as in EPIC phase II, capacity building is carried out across the range of stakeholders*

Lesson 4: The strategy of using communities to direct implementation and using science to measure the impacts of implementation and inform policy is excellent. The case of Nepal is an excellent example of how science-generated knowledge showed clearly the reduction of erosion after interventions and also showed the economic benefits of eco-safe roads over grey roads. These data have been fed into policy discussions through various meetings and workshops held at local and national levels, effectively raising awareness on eco-DRR issues and approaches, as an alternative to hard engineering solutions. *Recommendation 4. Ensure that in future projects on Eco-DRR and EbA, as well as in EPIC phase II, a balance among the three elements of the EPIC strategy — generating science-based knowledge; practising ecosystem-based disaster risk reduction and ecosystem-based adaptation and influencing policy — is achieved in all countries.*

Lesson 5. The EPIC project interventions on-the ground may have been small, but there are already several entry points for future work, that extend to a larger scale. One of the remarkable outcomes of the EPIC project is that interest has been generated among national and regional stakeholders and this could mean future scaled-up collaborations. For example, in Chile and China, several government organisations are interested learning more about Eco-DRR and the EPIC approach. At a regional level, ecosystem-based approaches have now been integrated into the Sendai Asia Regional Implementation Plan. In Africa, the Sahel and West Africa Program (SAWAP) (an umbrella programme, that supports the implementation of a country-driven vision for integrated natural resource management for

sustainable and climate-resilient development in 12 countries in West Africa and the Sahel using a landscape approach) and BRICKS (Building Resilience through Innovation, Communication and Knowledge Services) (a regional project that connects the 12 country project teams and partners working on the Great Green Wall Initiative, and provides opportunities for south-south learning; using monitoring and evaluation tools, geospatial services, best practices, peer review; and portfolio-wide communication) provides an excellent entry point. *Recommendation 5: Ensure that these possible avenues are explored thoroughly and consolidated at the very earliest.*

Lesson 6. Increasing the duration of the project would have enabled have enabled easier progress. Engaging with governments in developing countries takes time and in countries where there was restoration of ecosystems or ecosystem services, the duration of the project was insufficient to show evidence of the restoration of various ecosystem services. *Recommendation 6: Ensure that for future Eco-DRR and EbA projects and for EPIC phase II, the time frame provided for the project is adequate.*

Lesson 7: The project would have benefitted from a clear strategy that would have ensured sustainability of interventions. Even though most of respondents felt that project interventions were sustainable, there is no established mechanism for the continuation of the interventions. In Nepal community leaders plan to seek funding from the local government for continuation of their activities. A mechanism such as a community fund can be created, and used for the maintenance and hiring of equipment. Community members can pay a nominal sum to rent equipment and that again will feed into the fund**.** *Recommendation 7: Ensure that for future Eco-DRR and EbA projects and for EPIC phase II, a clear exit strategy that includes a mechanism for sustainable continuation of project interventions is included as part of project activities.*

Lesson 8. Dissemination about the learnings of the EPIC project could have been better. Dissemination about the learnings of the EPIC project, and the EPIC project itself has been good, but uneven across the countries. Increasing the national visibility of EPIC in some of the countries (for example, in Burkina Faso and Senegal) while making EPIC science accessible and understandable to the general public and decision-makers in others (for example, Chile and China) would help increase further the relevance of the EPIC project. In order to achieve better dissemination, a communication plan should be formulated and implemented within the project duration. *Recommendation 8: Ensure that for future Eco-DRR and EbA projects and for EPIC phase II, a communication plan — including knowledge dissemination through mass media, at scientific fora and to government officials — is formulated and implemented within the project duration. Ensure also that adequate staff time is provided for a specialist in communication.*

Lesson 9. Better integration of best practices related to biodiversity and environmental safeguards could have further enriched the interventions. Both Eco-DRR and EbA approaches are anchored in healthy ecosystems that provide a range of life-sustaining ecosystem services to humans (Reid and Alam, 2014). Biological diversity underpins ecosystem services (MEA, 2005). Thus, any activity that damages biodiversity or has the potential to damage it — that is, any of the drivers of ecosystem change — undermines the efforts of Eco-DRR and EbA. These links among biodiversity conservation and natural disasters and the stated 'best practices of IUCN' could have been better integrated into the

EPIC project. For example, charcoal production could have been offset by planting native trees; when alternative livelihoods were provided, the reduction in use of natural resources and /or degradation of habits measured, so that the links to conservation are clearly elucidated. It is noted that many of the players in the project are not biologists and therefore, are not entirely familiar with the basics about ecosystems, the gamut of ecosystem services, the links between ecosystem well-being and human well-being, the threats to biodiversity and the links to climate change and natural disasters. *Recommendation 9: For EPIC phase II or any other Eco-DRR or EbA project, it is essential that an investment be made at the inception workshop for the whole project, to bring diverse project staff (IUCN coordinators and implementing partners) on to the same page to work together to agree upon a) working definitions of important concepts related to biodiversity conservation, such as the range of ecosystem services, and drivers of ecosystem change; b) basic 'do and don'ts' that ensure environmental and social safeguards; and c) set environmental standards for the overall project which should maintained through the duration of the project.*
These should be turned into a hand book that can be provided for continual reference.

Lesson 10: More climate-science data, could have been used to climate-proof field interventions, whenever possible within the financial and time limitations

The focus of EPIC is Eco-DRR and EbA, which encompass extreme weather events and adaptation to climate change, respectively. Therefore, in some of the EPIC projects, more attention should have been paid to climate change. For example, in Chile, the modelling software used different scenarios such as avalanche volume and return periods, as well as the climate variables associated with the occurrence of disturbance events, but climate change scenarios have not been used. In China, extensive examination has been carried out to a) develop a conceptual framework to help local communities choose species to stabilise slopes; and b) select species suitable for slope stabilisation. However, assessments specifically testing the resilience of the selected plant species to observed climate-related changes in temperature or IPCC scenarios are lacking. *Recommendation 10: Ensure that in future Eco-DRR, EbA projects and EPIC phase II, ensure that all activities are climate-proofed.*

Lesson 11: Economic valuation is a strong bargaining tool in promoting Eco-DRR

Valuation has proven to be invaluable in convincing decision-makers about the importance of conserving ecosystems. It is a particularly important tool in terms convincing politicians of the benefit of Eco-DRR over hard engineering solutions. In Nepal, the EPIC project demonstrated the value of 'eco-safe roads' and showed that although the initial cost of eco-safe roads is higher than for grey roads, over a period of 40 years, the estimated cost of maintaining them is much less than that of grey roads. *Recommendation 11: Ensure that ecosystem valuation is included in future Eco-DRR and EbA projects and for EPIC phase II, as the generated knowledge can be used to make an economic case for Eco-DRR and EbA.*

Lesson 12: Inter-country learning provides excellent opportunities technological and practical assistance Inter-country study tours from Burkina Faso to Senegal and the reverse, support from a member of the EPIC Nepal team to Chile and the reverse were successful in terms of technological and practical assistance, but were limited to these four countries. Meetings with all six countries have been limited to one mid-term meeting held in 2014 and another, in

June 2017. The project, as a whole, would have benefited from an annual meeting of relevant headquarters staff, project coordinators and implementing partners. *Recommendation 12: Ensure that for future Eco-DRR and EbA projects and for EPIC phase II, annual meetings of all involved IUCN staff and implementing partners are budgeted for, and that the agenda for such meetings ensures that the progress is evaluated, issues are raised and solutions suggested for their resolution.*

Such annual meetings can be held in a different country each year, and field visits to implementing sites included in the agenda, so there is also hands-on learning.

Overall Recommendation: *An overall recommendation that follows from all the above is that IUCN may do well to draw upon the pool of 16,000 IUCN commission members to select a technical advisory committee who can be called upon to strengthen future projects by a) reviewing reports twice a year, and b) being available for consultation should a specific problem arise for any future Eco-DRR, EbA and EPIC phase II projects.*

It is concluded that the single most valuable contribution of the EPIC project has been the creation of awareness about Eco-DRR— both among communities and government officers — in the countries in which it was implemented. In this way, it brought together and worked with a diverse range of stakeholders.

The EPIC project has also provided limited evidence of the value of ecosystem restoration in re-establishing vital ecosystem services. The benefits of ecosystem restoration compared to grey infrastructure for disaster risk reduction can only be assessed *a posteori*, after an extreme weather event.

It is laudable that given its short duration, in general EPIC has been so successful in its policy advocacy.

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List of Acronyms

ADRC	Asian Disaster Reduction Center
ANR	Assisted Natural Regeneration
APROS	L'Association pour la Promotion des Œuvres Sociales (The Association for the Promotion of Social Work)
ARSDRR	African Regional Strategy for Disaster Risk Reduction
BMUB	Bundesministerium für Umwelt, Naturschutz, Bau und Reaktorsicherheit (Federal Ministry of the Environment, Nature Conservation, Building and Nuclear Safety, Germany)
CADL	Support Centre for Local Development
CATPCA	Categorical Principal Component Analysis
CBD	Convention on Biological Diversity
CBEMR	Community Based Ecological Mangrove Restoration
CCA	Climate Change Adaptation
CCAF	Climate Change, Agriculture and Food Security
CDE	Centre of Development and Environment
CGIAR	Consultative Group on International Agricultural Research
CNRD	Center for Natural Resources Development
CNRF	National Forestry Research Centre
CODESUR	Conseil Départemental de Secours d'Urgence et de Réhabilitation (County Council for Emergency Relief and Rehabilitation)
COMRECC	Regional Committee on Climate Change
CONAF	ational Cooperation of Forests
CONASUR	Conseil National de Secours d'Urgence et de Réhabilitation National Council for Emergency and Rehabilitation Assistance
CONEDD	National Council for the Environment and Sustainable Development
COP	Conference of Parties
COPROSUR	Conseil Provincial de Secours d'Urgence et de Réhabilitation (Provincial Council of Emergency Relief and Rehabilitation)
CORESUR	Conseil Régional de Secours d'Urgence et de Réhabilitation (Regional Council of Emergency Relief and Rehabilitation)
CPD	Civil Protection Directorate
CREATE	Climate Resilience Evaluation for Adaptation through Empowerment
CSPC	High Commission of Civil Protection
DFO	District Forest Officer
DMCR	Department of Marine and Coastal Resources
DoE	Department of Environment
DoF	Department of Forests
DRA	Disaster Risk Assessment
DRR	Disaster Risk Reduction
DRSRD	Disaster Relief and Social Relief Department
DSCO	District Soil Conservation Officer
DSCWM	Department of Soil Conservation and Watershed Management
EbA	Ecosystem-based Adaptation
Eco-DRR	Ecosystem-based disaster risk reduction
EFLGF	Environment Friendly Local Governance Framework
EGC	European Geosciences Congress
EMR	Ecological Mangrove Restoration
EPIC	Ecosystems Protecting Infrastructure and Communities
FAO	Food and Agricultural Organization of the United Nations
GCF	Green Climate Fund

GDP	Gross Domestic Product
GEMP	Global Ecosystem Management Programme
GLOF	Glacial lake outburst floods
GWP	Global Water Partnership
HCH	Hexachlorocyclohexane
HFA	Hyogo Framework of Action
HH	Household
HQ	Headquarters
IDRC	International Development Research Centre
IKI	International Climate Initiative
INERA	Institut National de l'Environnement et de Recherches Agronomiques (Institute of Environment and Agricultural Research)
INRA	l'Institut National de la Recherche Agronomique
IPCC	Intergovernmental Panel on Climate Change
ISE	Institute of Environmental Sciences
ISTOM	School of International Agro-development
IUCN	International Union for Conservation of Nature
IUFRO	International Union of Forest Research Organizations
IWL	Italian Workshop on Landslides
JICA	Japan International Cooperation Agency
LIDAR	Light Detection and Ranging
MAP	Mangrove Action Project
MCA	Ministry of Civil Affairs
MEA	Millennium Ecosystem Assessment
MFF	Mangroves for the Future
MMA	Ministerio del Medio Ambiente; Ministry of Environment of (Chile)
MoFSC	Ministry of Forests and Soil Conservation
MOP	Ministry of Public Works
MoU	Memorandum of Understanding
MSD	Multi-stakeholder Dialogue
NACCFC	Nepal Agricultural Cooperative Central Federation Limited
NCDR	National Commission for Disaster Reduction
NDRCC	National Disaster Reduction Center of China
NGO	Non-governmental Organisation
NPV	Net Present Value
NSFNC	National Strategic Framework for Nature Conservation
NTFP	Non-timber Forest Products
PACO	IUCN West and Central Africa Programme
PAO	Provincial Administration Organization
PCA	Principal Component Analysis
PEDRR	Partnership for Environment and Disaster Risk Reduction
PLI	Promoting Local Innovations
PNGR	National Platform for Disaster Risk Management
POP	Persistent Organic Pollutant
RAMMS	Rapid Mass Movement
REDD+	Reducing emissions from deforestation and forest degradation
SER	Society for Ecological Restoration
SERNAGEOMIN	Servicio Nacional de Geología y Minería (National Geology and Mining Service)
SLF	Swiss Institute for Snow and Avalanche Research
SWOT	Strengths, weaknesses, opportunities, threats
TNC	The Nature Conservancy
UNDP	United Nations Development Program
UNEP	United Nations Environmental Programme
UNFCCC	United Nations Framework Convention for Climate Change

UNIL	University of Lausanne
UNISDR	United Nations Office for Disaster Risk Reduction
VA	Vulnerability Assessments
VCA	Vulnerability and Capacity Analysis
VDC	Village Development Committee
WASWAC	World Association of Soil and Water Conservation
WCDRR	World Conference of Disaster Risk Reduction
WRI	World Resources Institute
WWF	Worldwide Fund for Nature
XTBG	Xishuangbanna Tropical Botanic Gardens

Chapter 1: Background and Context

Climate change is an over-arching threat, with its impacts (*inter alia* changes in weather patterns and ocean currents; increasing ambient temperatures on land and in the sea; sea level rise; salinisation of freshwater and ocean acidification) negatively affecting a range of constituents of human well-being (IPCC, 2014). One of its impacts — the increase in the intensity and frequency of extreme weather events that causes disasters — is already affecting human well-being profoundly, and will continue to do so in the future (IPCC, 2007). (See Figure 1; Figure 2.)
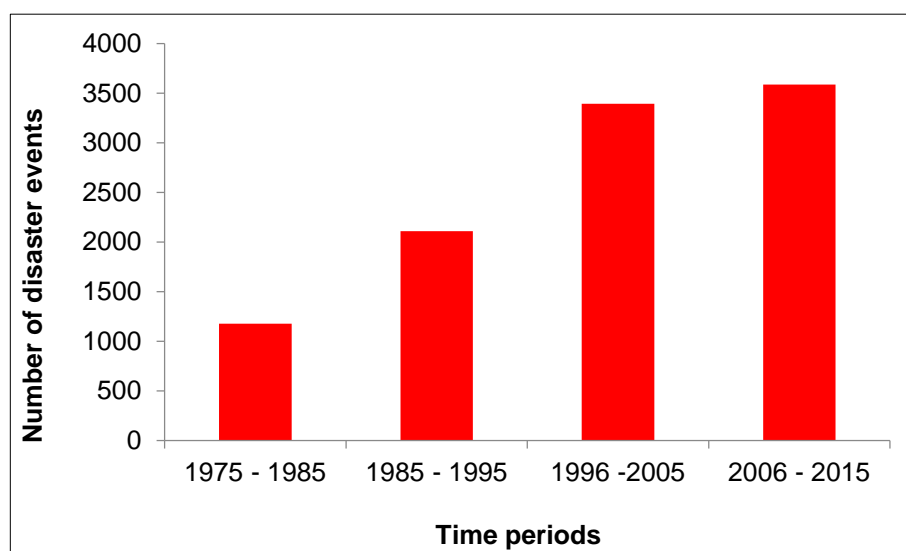
Figure 1. Trend in reported number of disaster events worldwide, (1975-2015)
(Source: Monty et al. 2016)
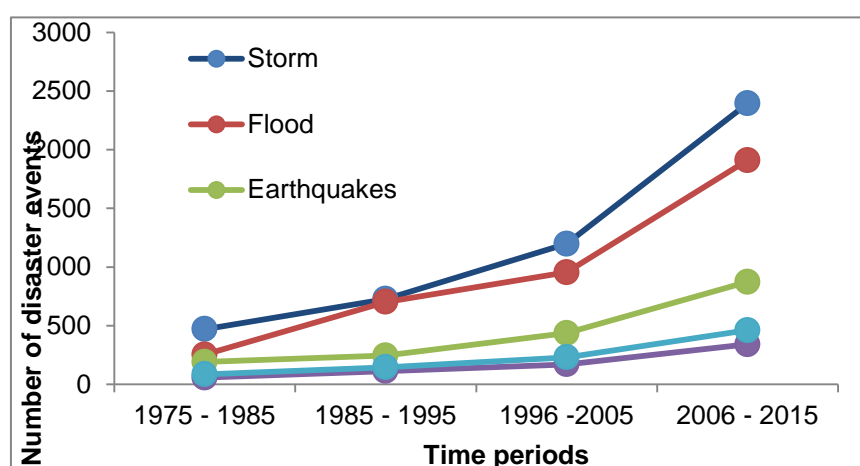
Figure 2. Trends in reported number of disaster events per natural hazard types worldwide (1975-2015)
(Source: Monty et al. 2016)

A 2015 report on 'The Human Cost of Weather-Related Disasters 1995-2015' (UNISDR, undated) states that

'Over the last twenty years, the overwhelming majority (90%) of disasters have been caused by floods, storms, heatwaves and other weather-related events. In total, 6,457 weather-related disasters were recorded . . . Over this period, weather-related disasters claimed 606,000 lives, an average of some 30,000 per annum, with an additional 4.1 billion people injured, left homeless or in need of emergency assistance . . . [and it is] *estimate[d] that economic losses from disasters are now reaching an average of US$ 250 billion to US$ 300 billion each year'* (Figure 3).
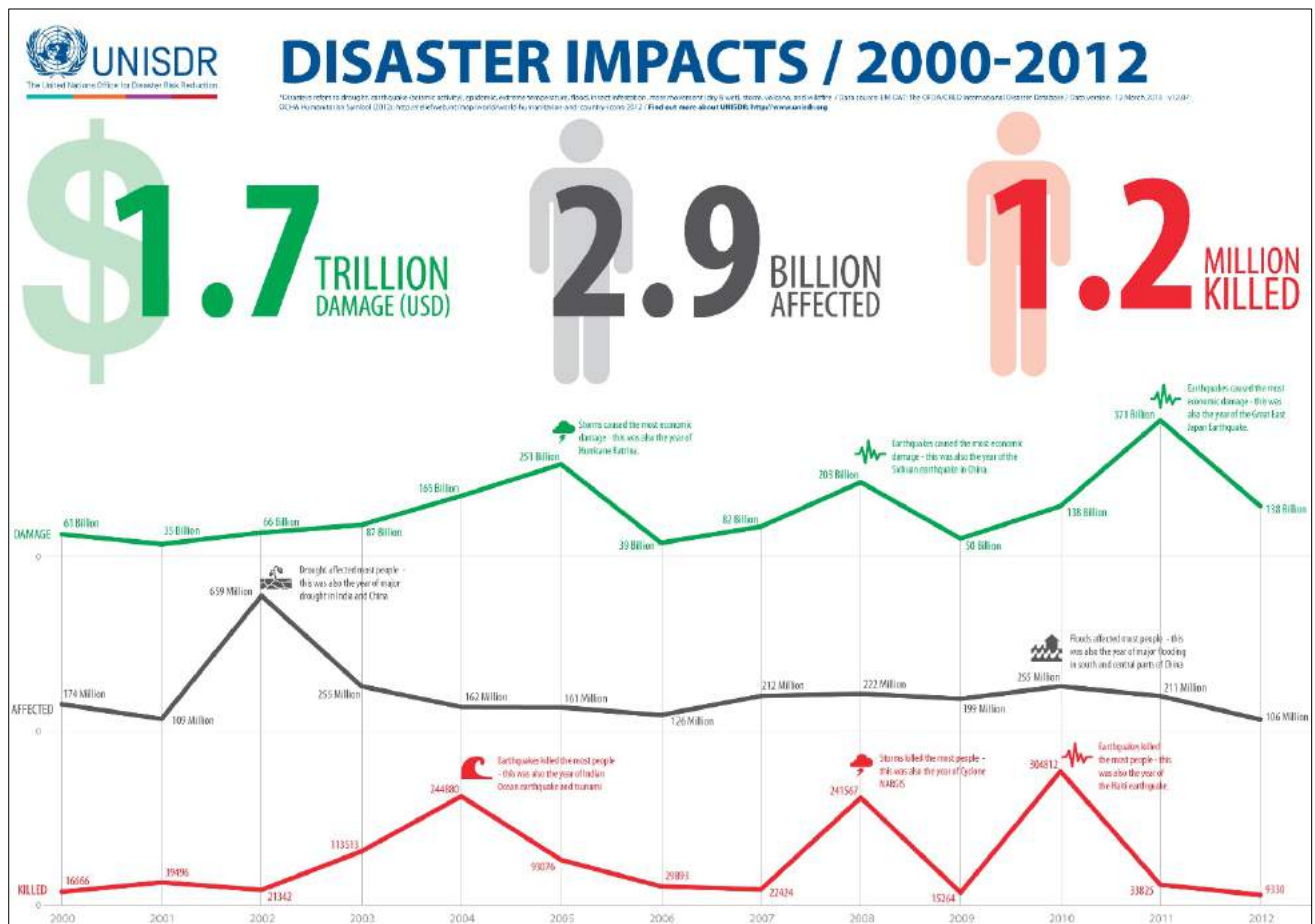
Figure 3. The Impacts of Disasters around the World (2000-2012)
(Source: UNISDR, 2013)

The Indian Ocean tsunami of December 2004 served to illustrate clearly how healthy ecosystems provided physical protection to coastal communities (Dahdouh-Guebas et al., 2005; Forbes and Broadhead, 2007; UNEP and WCMC, 2006). There is now a growing body of literature providing empirical evidence of the critical role that coastal and inland ecosystems play in reducing the vulnerabilities of communities (*inter alia*, Monty et al., 2016; Renaud et al., 2103; Spalding et al., 2014; UNEP and CNRD, 2014; Uy and Shaw, 2012). These data provided the impetus for the genesis of Ecosystem-based Adaptation (EbA) and Ecosystem-based Disaster Risk Reduction (Eco-DRR).

Box 1. Ecosystem-based Adaptation

'Ecosystem-based adaptation (EbA) is the use of biodiversity and ecosystem services[1] as part of an overall adaptation strategy to help people to adapt to the adverse effects of climate change. As one of the possible elements of an overall adaptation strategy, ecosystem-based adaptation uses the sustainable management, conservation, and restoration of ecosystems to provide services that enable people to adapt to the impacts of climate change. It aims to maintain and increase the resilience and reduce the vulnerability of ecosystems and people in the face of the adverse effects of climate change. EbA can generate significant social, economic and cultural co-benefits, contribute to the conservation of biodiversity, and build on the traditional knowledge and practices of indigenous peoples and local communities, including the important role of women as custodians of local knowledge . . .' (IUCN, 2009).

When EbA is practised, through the restoration or conservation of ecosystems, there is a range of ecosystem benefits (services) that are re-established, apart from regulating services[2]. For example, when ecosystems are healthy, they provide essentials such as food, fibre, fuelwood, medicines, and therefore, increase livelihoods opportunities (Naumann et al., 2011). They also play a significant role in climate change mitigation through their supporting services of primary production and, in turn, carbon sequestration (Duarte et al., 2013). In contrast, deforestation has been listed as the second largest anthropogenic source of CO_2 (van der Werf et al., 2009).

EbA is also more cost-effective than traditional engineering approaches (Munang et al, 2013).

Thus, overall, EbA is a low-cost, 'no regrets' approach where 'measures taken by communities [and/or facilitated by organisations] . . . do not worsen vulnerabilities to climate change or which increase adaptive capacities and measures that will always have a positive impact on livelihoods and ecosystems regardless of how the climate changes (IUCN, 2014).

Box 2. Ecosystem-based Disaster Risk Reduction

The concept of using ecosystems to reduce disaster risk — Ecosystem-based Disaster Risk Reduction(Eco-DRR) was proposed by the Partnership for Environment and Disaster Risk Reduction (PEDRR) in 2011 as the 'sustainable management, conservation and restoration of ecosystems to provide services that reduce disaster risk by mitigating hazards and by increasing livelihood resilience' (Monty et al, 2016), and formalised by Estrella and Saalismaa (2013) as 'the sustainable management, conservation and restoration of ecosystems to reduce disaster risk, with the aim of achieving sustainable and resilient development.'

Ecosystem-based adaption became absorbed slowly into the arena of multi-lateral agreements. In 2004, decision VII/15 of the seventh Conference of Parties (COP) of the Convention for Biodiversity (CBD) 'encouraged the management of ecosystems for climate change adaptation and mitigation' (Lo, 2016).

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[1] Defined as the benefits that ecosystems provide for human well-being (MEA, 2005).

[2] Such as climate and flood regulation, protection from natural hazards, water and air purification and disease regulation (Munang et al, 2013).

In 2009, the Second Ad Hoc Technical Expert Group on Biodiversity and Climate Change defined ecosystem-based adaptation as

> '*the use of biodiversity and ecosystem services as part of an overall adaptation strategy to help people to adapt to the adverse effects of climate change . . . It aims to maintain and increase the resilience and reduce the vulnerability of ecosystems and people in the face of the adverse effects of climate change. Ecosystem-based adaptation is most appropriately integrated into broader adaptation and development strategies*' (CBD 2009 in litt. Lo, 2016).

Subsequent CBD COP decisions (X/33, XI/19, XI/21, XII/20) also refer to and promote EbA (CBD, 2010; 2012a, 2012b; 2014).

In 2008, at the COP 14 of the UNFCCC, the concept of ecosystem-based adaptation was first introduced, and two years later in 2010, at COP 16, the Cancun Adaptation Framework promoted 'Building resilience of socio-economic and ecological systems, including through economic diversification and sustainable management of natural resources' (Lo, 2016; Monty et al. 2016; UNFCCC, 2011).

In 2015, the Sendai Framework for Disaster Risk Reduction 2015-2030 (also called the Sendai Framework), succeeding the Hyogo Framework for Action (HFA) 2005-2015, uses the phrases 'ecosystem approach' and 'preserving ecosystem functions that help to reduce risks' indicating a greater emphasis on EbA (Monty et al., 2016; UNISDR, 2015).

In the context of worsening climate-related disasters, disaster risk reduction (DRR) — 'the concept and practice of reducing disaster risks through systematic efforts to analyse and manage the causal factors of disasters, including through reduced exposure to hazards, lessened vulnerability of people and property, wise management of land and the environment, and improved preparedness for adverse events' (UNISDR 2009) — also became important (Lo, 2016).

Like EbA, Eco-DRR has also now been integrated into the language of multi-national agreements. For example, decision XII/20 of the seventh COP of the CBD specifically refers to biodiversity, climate change and disaster risk reduction and 'encourages parties . . . to promote and implement ecosystem-based approaches to climate change related activities and disaster risk reduction' (CBD, 2014).

In 2015, resolution XII.13 of the 12th COP of the Convention on Wetlands of International Importance (Ramsar Convention) detailed the role wetlands and disaster risk reduction and called for the integration of wetland-based disaster risk management and climate change adaptation into development policies and planning (Monty et al., 2016; Ramsar, 2015).

In 2016, the landmark UNFCCC Paris Agreement came into force, ratified by 141 parties of the convention. The adaptation goals focus on enhancing adaptive capacity, increasing resilience, and limiting vulnerability as usual, but the language of the agreement includes many more references to the environment and ecosystems, including 'preserving environmental integrity' and recognising 'the importance of conservation and enhancement' (UNFCCC, 2015).

EbA and Eco-DRR are intimately inter-linked and are both based on the premise of the conservation of ecosystem services (Monty et al., 2016). However, there are basic differences in the two approaches. These differences and convergences are listed in the table below.

Table 1. The differences and convergences between EbA and Eco-DRR
(Sources: Taken directly from IUCN, 2014; Monty et al., 2016)

	Differences		Convergences
	EbA	Eco-DRR	
Aim	The strategic use of biodiversity and ecosystem services to help people adapt to the adverse effects of climate change by continuing to provide ecosystem benefits that contribute to human well-being.	Reducing human vulnerabilities and enhancing resilience in the context of natural hazards through sustainable management, conservation and the restoration of ecosystems	Key differences in stated aims are purely semantic, that is, in how terminology is used. Both Eco-DRR and EBA emphasise the multiple benefits of ecosystem services, including for sustainable livelihoods.
Time frame	Deals primarily with future uncertainties and new risks.	Focuses on addressing existing risks from a historical perspective.	
Type of hazard	Deals only with climate-related hazards, but also deals with the impacts of climate change.	Deals not only with climate-related hazards, but also with non-climate hazards.	Most Eco-DRR and EBA projects deal with water and climate-related hazards; Eco-DRR is increasingly including climate change impacts.
Type of assessments	Conducts vulnerability assessments (VA), usually starting with an ecosystem focus (for example, impact of climate change on biodiversity loss and ecosystem integrity), and developing future change scenarios.	Conducts disaster risk assessments (DRA), usually starting with a focus on hazards, exposure and vulnerabilities as core elements to understanding disaster risk, but also assessing linkages to environmental conditions and natural resource management.	Both seek to incorporate ecosystems and environmental factors within their assessment frameworks; with growing appreciation in Eco-DRR to incorporate future climate trends. But given difficulties in determining future climate change projections, especially at a field/local level, both Eco-DRR and EBA projects tend to rely on examining past and current risks, a key characteristic of DRR practice.
Actors	Typically involves environmental agencies/ ministries, conservation NGOs, climate change national focal points; usually	Typically involves environmental agencies/ ministries, conservation NGOs but also humanitarian and disaster	Both increasingly recognise the importance of bringing together different communities and

	Differences		Convergences
	does not engage with humanitarian or disaster management actors	management actors at local and national levels, as well as climate change focal points	sectors, including from disaster management, climate change, environment and other key sectors (for example, water, agriculture).

The commonalities of the approach far outweigh the differences as shown in Figure 4.
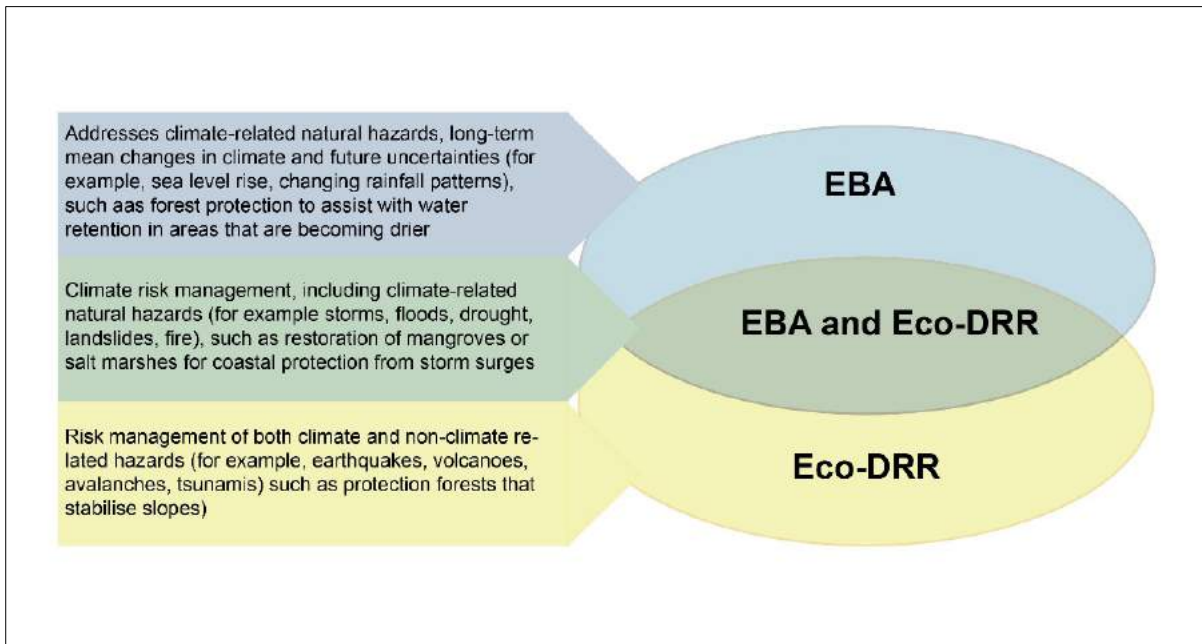
Figure 4. Differences and convergences between EbA and Eco-DRR
(Source: Lo, 2016)

IUCN, International Union for Conservation of Nature has been at the forefront of EbA and Eco-DRR since the Indian ocean tsunami of December 2004. Initially supporting the governments of severely affected countries such as Sri Lanka (*inter alia*, Bambaradeniya et al., 2006; IUCN, 2005; 2006a) and Thailand (Kallesőe et al., 2008; IUCN 2006b), IUCN soon moved into promoting coastal ecosystem conservation for sustainable development through its multi-partner initiative Mangroves for the Future (MFF).

IUCN's EbA programme is extensive, implementing 45 projects in 58 countries worldwide since 2010 (see Figure 5) (Rizvi, 2014).
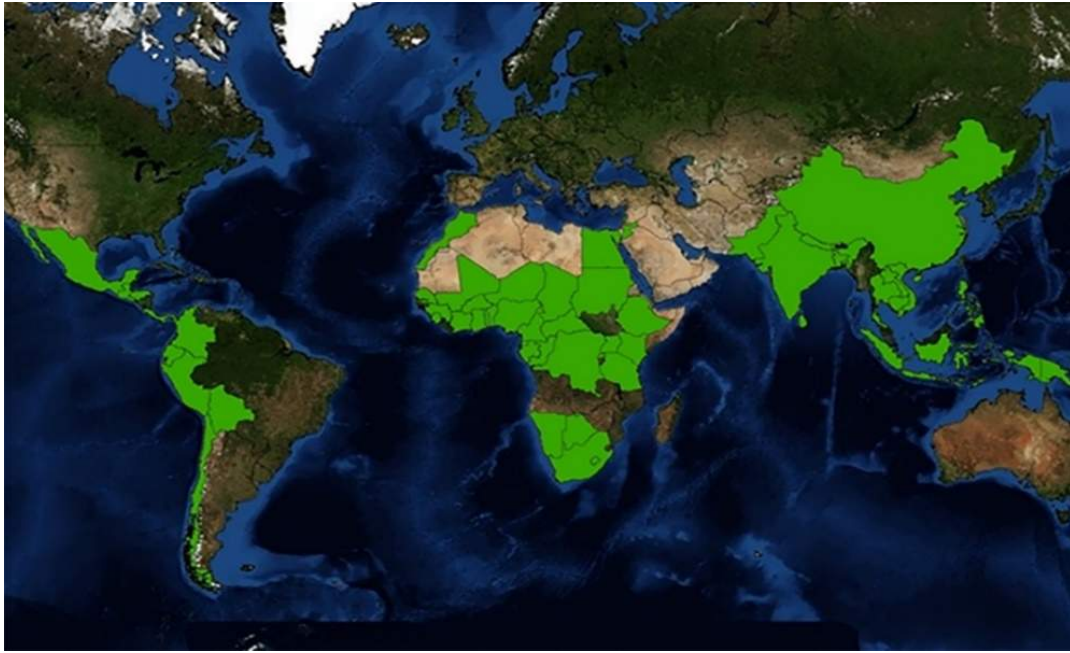
Figure 5. World map of the countries where IUCN EbA-related projects are implemented
(Source: Rizvi, 2014)

This report evaluates a single project by IUCN, specifically tailored with the goal of recognising, promoting and conserving ecosystem services as integral to disaster risk reduction. The Ecosystems Protecting Infrastructure and Communities (EPIC) project (a 5-year project that commenced in 2012) implements ecosystem-based approaches to protect communities from disasters and impacts of climate change through six case studies in Burkina Faso, Chile, China, Nepal, Senegal and Thailand (IUCN, 2012).

Chapter 2: Ecosystems Protecting Infrastructure and Communities (EPIC)

1.   Background

Ecosystems Protecting Infrastructure and Communities (EPIC) is a five-year initiative that uses ecosystem-based approaches to protect communities from disasters and the negative impacts of climate change. It promotes the implementation of ecosystem-based disaster risk reduction (Eco-DRR) through five projects in Burkina Faso, Chile, China, Nepal, Senegal and Thailand.

Commenced in 2012 and due to end in August 2017, EPIC is funded by the Germany's Federal Ministry of the Environment, Nature Conservation and Nuclear Safety's (Bundesministerium für Umwelt, Naturschutz, Bau und Reaktorsicherheit — BMUB) International Climate Initiative (IKI) (IUCN, 2012).

2.   Goals, objectives and predicted outcomes

The over-arching project goal of EPIC is that 'ecosystem services are recognised, promoted and conserved as an integral part of disaster risk reduction policy, planning and programming in the six target countries and in key global processes such as implementation of The Hyogo Framework of Action of UNISDR, and climate change adaption framework of the UNFCCC' (IUCN, 2012).

The objective of this global project is to contribute to community resilience by:
- Documenting scientific evidence;
- Building capacities to understand vulnerabilities and take action by using best practices
- Promoting effective policies for integrated approaches to disasters, climate change; and environment management (IUCN, 2015a).

It's aims are to
- demonstrate the effectiveness and economic value of environmental management for disaster risk reduction and climate change adaptation, while bringing wider livelihood benefits to communities;
- raise awareness on the potential of environmental management to address disaster risk reduction and climate change adaptation;
- work with communities to identify and implement locally nature-based measures for disaster risk reduction and climate change adaptation;
- assist national and local governments to establish facilitating policy mechanism;
- disseminate lessons learned and share empirical cases of application of nature-based solutions to enable replication in other areas;
- build national, sub-national and local capacities for the implementation of ecosystem-based disaster risk reduction and climate change adaptation.

The expected outputs of this project are as follows:

- Output 1: One common research and learning framework developed, and five case studies covering the target countries established and implemented.
- Output 2: Tailored policy messages for seven countries and two international organizations, and one capacity building package developed.
- Output 3: Seven multi-stakeholder dialogue (MSD) platforms, comprised of government, NGOs, civil society established in target countries, that use and promote nationally, and provide input into the findings of the project (IUCN, 2012).

3. Strategy of the project

EPIC uses a strategy that combines generating science-based knowledge; practising ecosystem-based adaptation (EbA); influencing policy; and working with a range of stakeholders from grass-roots levels to the national level to achieve its results. (See Figure 6.)
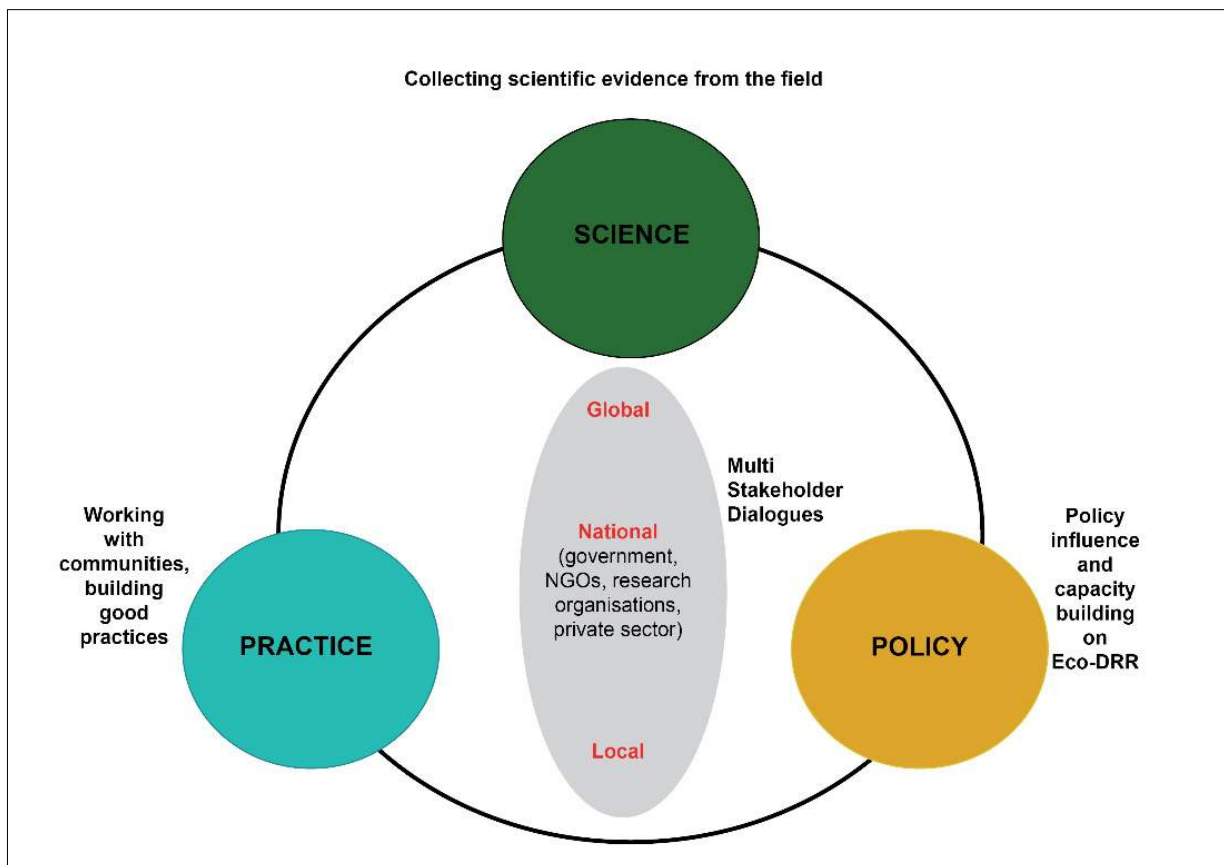
Figure 6. The EPIC Strategy
(Source: adapted from Buyck, 2016)

4.   Countries selected for EPIC interventions

The EPIC project involves six countries (Burkina Faso, Chile, China, Nepal, Senegal and Thailand) (Figure 7).

Figure 7. EPIC project sites

These range from low to high income countries combating a range of natural hazards and disasters. A table providing a snapshot of information about socio-economics, livelihoods, natural hazards, climate change impacts and risk, across the six countries is presented in Table 2.

Figure 8. Country snapshots: top left: Northern Province, Ouahigouya district, Burkina Faso; top right: Chile; middle left: Yunnan Province China; middle right: Nepal; bottom left: Djilor, Senegal; bottom right: Koh Klang, Thailand
(top left: © Sylvain Zabre; top right: © IUCN-SUR; middle left: © Claire Pedrot; others: © Sriyanie Miththapala)

EPIC interventions ranged from strengthening local climate change adaptation strategies for floods and drought in Burkina Faso; quantifying and improving the protective capacity of forests against snow avalanches through modelling in Chile; eco-engineering for landslide stabilisation using appropriate plant species in China; slope restoration and infrastructure planning to reduce landslides in Nepal; identifying nature-based measures against floods and salt intrusion in Senegal; and community-based ecological mangrove restoration for storm surges and other coastal hazards in Thailand.

Maps of sites locations are presented in Figure 3-5 and a table providing a snapshot of information about site locations, communities and their populations, issues, goals and intervention objectives is presented in Table 3.

Table 2. Snapshot of information related to socio-economics, livelihoods, natural hazards, climate change impacts and risk across the six EPIC countries
(Sources after the table)

Country	Socio-economic context	Main livelihood(s)	Natural hazards	Climate change impacts	Global Climate Risk Index 2017) (rank)	World Risk Index and Rank
Burkina Faso	Population = 19.0 million; low income country; GDP (2015) in current US$= 10.678 billion; poverty headcount ratio at national poverty lines (% of population) = 40.1 (2015)	90% of the working population are subsistence farmers (contributes 22.9% of GDP and employs 90% of the working population); services (51.5% of GDP) and industry (25.7% of GDP) employ 10% of the working population.	Droughts, locust invasions, storms, and floods	• A 0.8°C and 1.7°C increase in mean temperature by 2025 and 2050, respectively; • A -3.4% and -7.3% decrease in rainfall by 2025 and 2050 respectively; • Risk of rainy season starting earlier and ending later, with less rain in some months and more in others; • Risk of increased variability of annual rainfall; • Risks of more frequent downpours and increased variability in pockets of droughts at the beginning and then end of the rainy season; • Risk of increase in maximum and minimum temperatures of 2.5°C to 5°C; and • Risk of significant increase in monthly potential evapotranspiration (2 to 10 mm).	110	9.54; 39; ranks 15th worldwide in lacking adaptive capabilities
Chile	Population = 18.2 million; high income country; GDP (2015) in current US$= 240.796 billion; poverty headcount ratio at national poverty lines (% of population) = 14.4 (2013)	This is a market oriented economy with a high level of foreign trade. Copper exports alone account for 20% on revenue. The services sector (contributing 61.6% of the GDP and employing 63.9% of the working population); followed by industry (35% of the GDP and employing 23% of the working population) are the main sectors, with	Floods, wildfires, volcano activity, earthquakes, avalanches, extreme temperatures, storms	• Increase in mean annual temperatures 1°C to 4°C by the end of the century; • A change in rainfall pattern from north to south, resulting in water shortage in the central part of the country and water excess in the south; • The above changes will likely exacerbate the impacts of the El Niño Southern Oscillation; • Glaciers, which are water reserves, will continue to retreat; and • Decrease in capacity of snow storage in the mountains, shifting the snowline to higher altitudes...	100	11.65; 22; ranks 11th worldwide for exposure to natural hazard

Country	Socio-economic context	Main livelihood(s)	Natural hazards	Climate change impacts	Global Climate Risk Index 2017) (rank)	World Risk Index and Rank
		agriculture only contributing 3.4% of the GDP and employing 13.2% of the working population).				
China	Population = 1,378 million; upper middle-income country; GDP (2015) in current US$= 11.008 trillion; poverty headcount ratio at national poverty lines (% of population) = N/A	China is currently the largest exporter in the world, with the services sector (contributing 48.4% of GDP and employing 36.1% of the working population); followed by industry (42.7% of GDP and 30.3% of the working population) being the main employment sectors. However, it is also the largest producer and consumer of agricultural products although agriculture contributes only 9.3% of the GDP 34.8% of the working population is employed in agriculture.	Earthquakes, floods, storms, storm surges, forest fires, droughts, insect damage, landslides and slope failures.	• Typhoons, storm surge and long-term inundation in coastal regions; • Increased water scarcity in the north and northeast: • Desertification (higher evaporation) in the northwest; • Change in river flows / melting glaciers in the Tibetan Plateau; and • Increase in flood frequency and magnitude; northwards spread of tropical disease vectors in southern China.	34	6.39; 85
Nepal	Population = 28.4 million; low income country; GDP (2015) in current US$= 13.61 billion; poverty headcount ratio at national poverty lines (% of population) = 25.2 (20104)	Nepal is heavily dependent on foreign remittances; nut agriculture is the main livelihood (contributing 31.7% of GDP and employing 69% of the working population). The services sector (contributing 53.2% of the GDP and employing 19% of the working population); and industry (15.1% of GDP and 12% of the	Droughts, earthquakes, epidemics, extreme temperatures, floods, landslides, fires (both household and forest), wind damage, and abnormally low	• Uneven increases in maximum temperatures at an annual rate of 0.04-0.06°C (warming is greater at higher altitudes); • Decrease in pre-monsoon rainfall in far- and mid-western Nepal, with a few pockets also of in the western, central and eastern regions but an increasing pre-monsoon trend in the rest of the country; • Mean annual temperature is predicted to increase by an average of 1.2°C 1.7° and 3°C by 2030, 2050 and 2100 respectively.	24	5.12; 108

Country	Socio-economic context	Main livelihood(s)	Natural hazards	Climate change impacts	Global Climate Risk Index 2017) (rank)	World Risk Index and Rank
		working population) make up the rest.	temperatures.	• Higher temperature increases are predicted during the winter than during the rainy season; • Himalayan glacier melt and retreat; and • Glacial lake outburst floods (GLOF).		
Senegal	Population = 14.8 million; low income country; GDP (2015) in current US\$= 21.195 billion; poverty headcount ratio at national poverty lines (% of population) = 10.5 (2014)	Mining, construction, tourism, fisheries and agriculture are the main livelihoods, the latter being the primary livelihood in rural areas. Agriculture contributes only 17.1% to the GDP but employs 77.5% of the working population. The services sectors (contributing 58.6% of the GDP) and industry (contributing 24,3% of GDP) combined employ only 22.5% of the working population.	Droughts, locust invasions, floods and coastal erosion; salinization.	• Decrease in annual precipitation of 5.97mm since 1948 (one of the greatest reductions in the continent); • Highly variable rainfall patterns (due to more infrequent precipitation and an increase in the amount of rain falling in single events); • Rising sea levels in Senegal, driving soil salinisation and degradation; and • Increase in the frequency and magnitude of droughts and floods.	144	10.38; 32.
Thailand	Population = 65.3 million; upper middle-income country; GDP (2015) in current US\$=395.168 billion; poverty headcount ratio at national poverty lines (% of population) = 46.7 (2010)	Is heavily dependent on exports such as electronics and vehicle; and the service sector (contributing 51.9% of GDP and employing 51.1% of the working population) and the industrial sector (contributing 37.7% of the GDP and employing 16.7% of the working population) drive the economy, However, even though agriculture contributes on 10.4% of the GDP, it employs	In the North: floods, landslides, earthquakes and forest fires. In Central Thailand: floods and earthquakes. In the Northeast: floods and droughts. In the South: floods, tropical	• Significant increases in mean annual by about 0.95° C between 1955 and 2009; • Increase in the number of warm days and nights (>35° and >25° with substantial regional differences; • Decreasing total rainfall in central and eastern Thailand but increasing rainfall in the northeast and Gulf region as well as the Bangkok metropolitan area; and • Seasonal shifts in the rainfall volume, changes in rainfall patterns, more intense rain, and decrease in the number of rainy days; • Sea level rise of 3 - 5 mm per year	10	6.19; 89

Country	Socio-economic context	Main livelihood(s)	Natural hazards	Climate change impacts	Global Climate Risk Index 2017) (rank)	World Risk Index and Rank
		32.2% of the working population, with Thailand being a major exporter of rice and shrimp.	storms, landslides and forest fires.	from 1993 – 2008 in the gulf of Thailand; • More frequent and intense long dry spells and flash floods; • More frequent and intense tropical storms.		

(Sources:
Socio-economic context
population: Population Reference Bureau, 2016;
other socio-economic data: World Bank, 2016;
Main livelihoods
Index mundi (2016), individual country profiles for 2016.
Natural hazards*:*
Asian countries: ADRC, 2017;
Others: Prevention Web (undated);
Climate change impacts:
NAPA (2015). Burkina Faso: Burkina Faso National Climate Change Adaptation Plan
Chile: Adaptation Partnership, 2011
China: Nadin, undated
Nepal: Ministry of Environment, 2010
Senegal: Ministry of Environment and Protection of Nature, 2006
Thailand: Naruchaikusol, 2016
Global Climate Risk Index and Rank, 2017: Kref et al, 2017: assesses the extent countries have been affected by the impacts of weather-related loss events
World Risk Index and Rank: United Nations University (2016) World Risk Report 2016; assesses risk in relation to dealing with natural disasters)
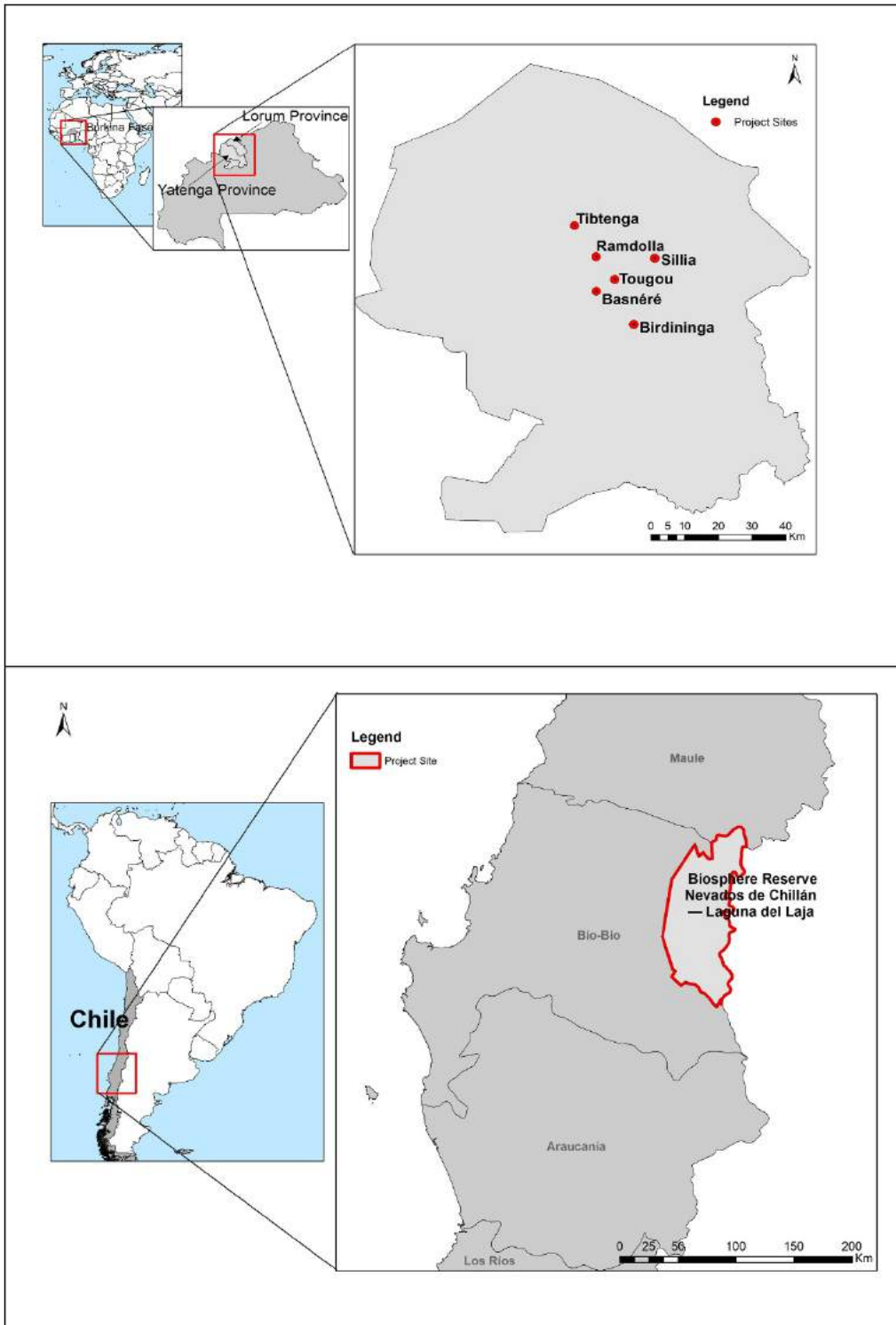
Figure 9 EPIC Site Locations in Burkina Faso and Chile
(Top: Burkina Faso; bottom: Chile, with the EPIC project locations as enlarged insets; Sources of locations: EPIC country-wise Composite Project Reports)
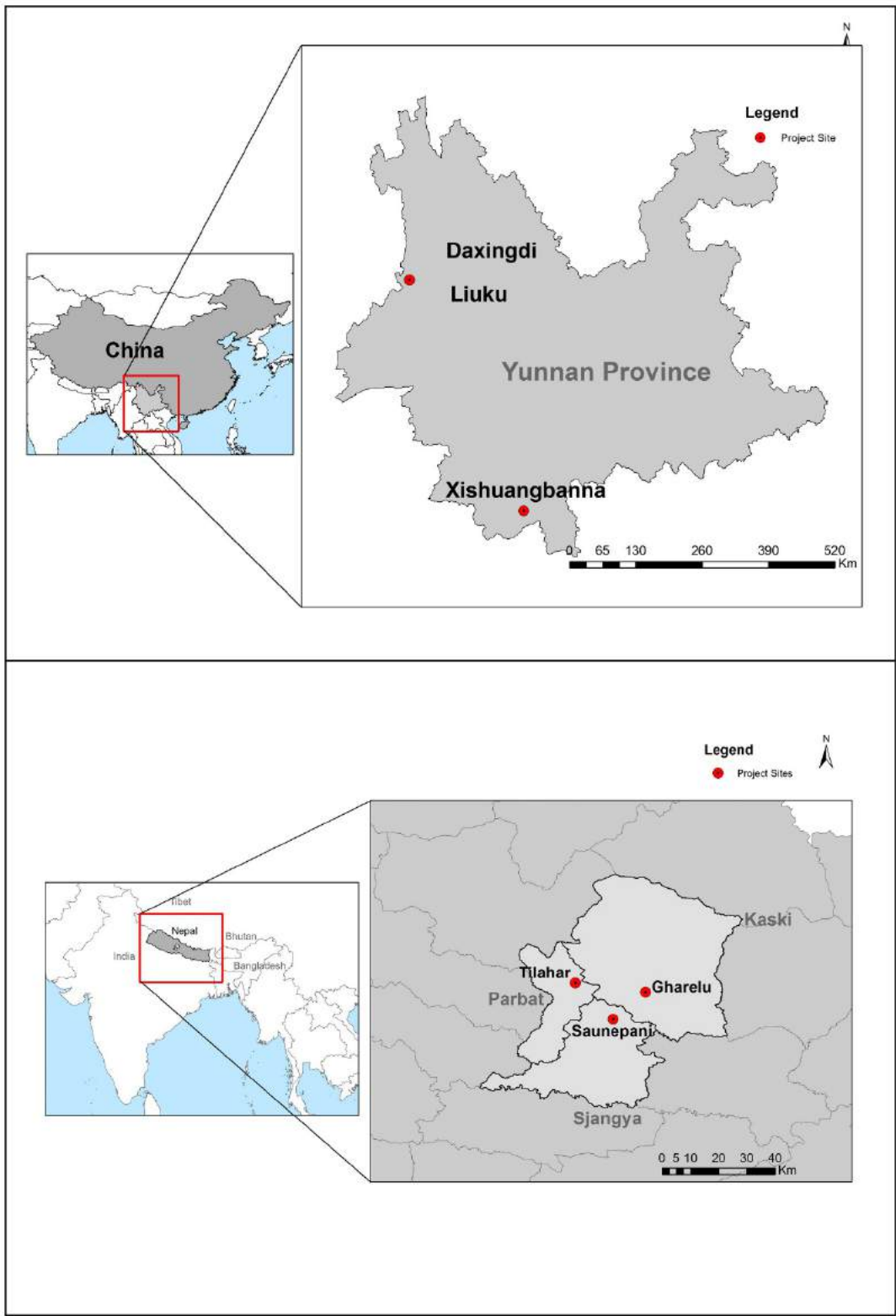
Figure 10 EPIC Site Locations in China and Nepal
(Top: China; bottom: Nepal, with the EPIC project locations shown as enlarged insets; Sources of locations: EPIC country-wise Composite Project Reports)
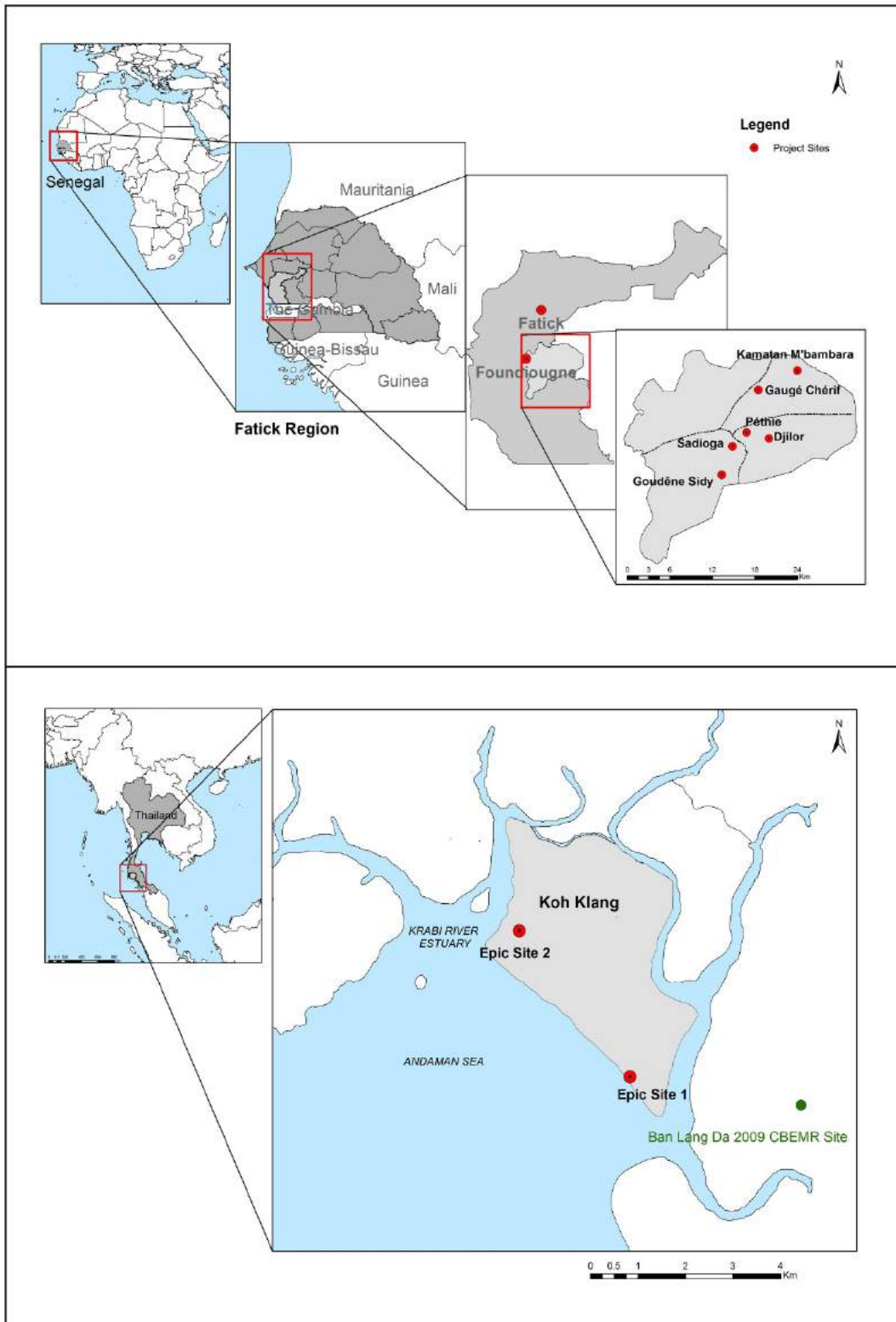
Figure 11 EPIC Site Locations in Senegal and Thailand
(Top: Senegal; bottom: Thailand, with the EPIC project locations shown in enlarged insets; Sources of locations:
EPIC country-wise Composite Project Reports)

Table 3. Snapshot of information related information about site locations, communities and their populations, issues, goals and intervention objectives in the six EPIC countries

(Sources: Country specific Baseline Reports; IUCN,2012; direct queries from project coordinators)

Country	Project sites: Village (District/ Municipality/ Province in parenthesis)	Total population of community (number involved in parenthesis)	Livelihood(s)	Issues	Project title	Goal of country project	Intervention Objectives
Burkina Faso	6 villages Basnéré (Namissiguima) Birdininga (Namissiguima) Ramdolla (Barga) Sillia (Titao) Tibtenga (Koumbri) Tougou (Namissiguima)	Basnéré = 460 (414) Birdininga= 92 (83) Ramdolla= 2,006 (1,605) Sillia= 1,820 (1,456) Tibtenga= 366 (256) Tougou= 5,437 (2,719)	Agriculture, livestock and trade	• Prone to drought, floods, high winds and high temperature; and • Rampant overexploita-tion and naturally adverse soil and climatic conditions diminish crop yields (Burkina Faso's agricultural sector the lowest performing in Africa)	Strengthening local climate change adaptation strategies in West Africa	To diversify and strengthen the actors and their strategies involved in the prevention and adaptation to climate change impacts (drought and floods) on livelihoods and natural resources.	1. The risks and/or effects of climate change on poor people, on poverty efforts are documented and assessed to the benefit of local decision makers of the rural development, water resources and environment sectors 2. Economic benefits of integrated ecosystem-based adaptation strategies on the reduction of rural poor communities' vulnerability are demonstrated

Country	Project sites: Village (District/ Municipality/ Province in parenthesis)	Total population of community (number involved in parenthesis)	Livelihood(s)	Issues	Project title	Goal of country project	Intervention Objectives
Chile	Biosphere Reserve Nevados de Chillán – Laguna del Laja (Ñuble and Biobío)	Did not work with communities but there are 95,900 people in the buffer zone; reach of the project is more than 200 people.	Plantation forestry, agriculture and tourism	• Prone to a multitude of natural hazards, including snow avalanches; Regulated and unregulated firewood collection for commercial and subsistence purposes is driving extensive deforestation and ecosystem loss in Biobío	Quantifying and improving the protective capacity of forests against snow avalanches	To quantify and optimise the value of mountain ecosystems in the reduction of risk associated with snow avalanches and other natural disturbances, such as rockfalls and debris flows.	1. To improve considerations regarding the effect of forests in avalanche simulation models; 2. To analyse the avalanche hazard while keeping in mind the diverse scenarios for climate change and use of soil; 3. To promote the optimised management of mountain ecosystems.
China	Two sites near • Daxingdi village, north of Liuku town in the Salween River Valley • Nan Lin Shan mountain of Xishuangbanna, Yunnan province, China.	Daxingdi=6,258 Liuku=23,522 Project area= 50	Agriculture	• Prone to geological hazards, notably landslides; • 10% of China's geological disaster-prone sites are in Yunnan; • 52% of the land area of the Salween watershed is subject to soil erosion	Eco-engineering for stabilization of steep slopes in southern China	To identify native plant species playing a key role in stabilising and to establish relevant planting mixtures of these species in the target hillside landscapes (eco-engineering to combat landslides)	1. Investigate the use of eco-engineering for the stabilisation of steep slopes
Nepal	3 villages • Saunepani (Sjangya district)	• Saunepani = 90 (90) • Gharelu = 105	Agriculture and livestock	• Highly landslide-prone; and	An Operational Framework for	To build resilience to landslide risk through the demonstration of	1. Enhance local knowledge and national uptake of bio-engineering for eco-safe

Country	Project sites: Village (District/ Municipality/ Province in parenthesis)	Total population of community (number involved in parenthesis)	Livelihood(s)	Issues	Project title	Goal of country project	Intervention Objectives
	• Gharelu (Kaski district) • Tilahar (Parbat district)	(105) • Tilahar= 120 (120)		• Exacerbated by rural road construction	Reducing Risk from Landslides and Flash Floods in Eastern Nepal's Churia Hills	'eco-safe' roads. This comprises up-scaling the use of ecosystem services along rural roads for landslide stabilisation.	roads 2. Build capacity of local and national actors (development, environment and DRR actors) through workshops, trainings and visits 3. Use scientific and local knowledge to enhance ecosystem resilient communities Conduct research on use of plant species (grass) for rural road slide slope protection under climate change 4. Conduct research on use of plant species (grass) for rural road slide slope protection under climate change 5. Mainstream Ecosystem-based DRR into local, national and global policies 6. Inter-country learning and sharing of knowledge among the EPIC countries (and dissemination within and without Nepal)

Country	Project sites: Village (District/ Municipality/ Province in parenthesis)	Total population of community (number involved in parenthesis)	Livelihood(s)	Issues	Project title	Goal of country project	Intervention Objectives
Senegal	Djilor Gagué Cherif Goudème Sidy Kamatane Bambara Péthie Sadioga (All Djilor commune, department of Foundiougne, Fatick region)	Djilor= 3,157 (1,105) Gagué Cherif=985 (591) Goudème Sidy=864(346) Kamatane Bambara=277(222) Péthie=427(256) Sadioga=1,005 (704)	Agriculture, livestock rearing and fisheries	• General trend of plant resource degradation due to several factors, including agricultural encroachment, high domestic fuelwood use; and • Progressive land salinisation exacerbated by recurrent drought events.	Strengthening local climate change adaptation strategies in West Africa	To strengthen local adaptation strategies to climate change	1. Assessing the risks and effects of climate change on the poor 2. Demonstration of the economic benefits of Ecosystem-based Adaptation (EbA)
Thailand	Site # 1 Bang Laem Pond, Baan Klong Kum Village (Krabi Province, Muang District) Site # 2 Imam's Pond, Baan Koh Klang Village Bang Laem Pond, Baan Klong Kum Village (Krabi Province, Muang District)	1,462 (300)	Fishing, aquaculture and subsistence harvesting of NTFP	Flooding is an annual disaster phenomenon in Thailand, however, the magnitude of floods has increased in the last decade	Demonstrating ecological mangrove restoration	To use the Community Based Ecological Mangrove Restoration (CBEMR) method to restore abandoned aquaculture ponds to productive mangroves, which will aid coastal protection and support resource based livelihoods, especially fisheries.	1. To create an CBEMR demonstration site for future CBEMR trainings in Thailand and build awareness of the hydrological factors in restoring areas degraded by man-made changes to the hydrology 2. To use a multi-stakeholder approach during the entire process involving government, local people, and NGOs. 3. Empower and build capacity of local communities as central stakeholders in coastal resource management so that they become examples of agents of change in a bottom-up approach to neighbouring communities and hopefully leading to the establishment

Country	Project sites: Village (District/ Municipality/ Province in parenthesis)	Total population of community (number involved in parenthesis)	Livelihood(s)	Issues	Project title	Goal of country project	Intervention Objectives
							of a local community network 4. To restore the biodiversity of mangrove habitat, which many community members depend on as a supplementary livelihood such as producing thatch for income and mud crab collection. 5. Develop and deliver tailored policy messages for target government agencies 6. Establish a stakeholder dialogue platform, comprised of government, NGOs, civil society established in Thailand, which will use and promote nationally and provide input to the findings of the project

5.   Operations and Partners

The project is coordinated by the IUCN Global Ecosystem Management Programme (GEMP). Overall coordination has been based from IUCN Headquarters in Gland, Switzerland, where the project coordinator and the project officer are based, with IUCN West and Central Africa Programme (PACO), IUCN-South American Region, IUCN Asia Regional Office, IUCN Nepal and China country offices, the IUCN Commission on Ecosystem Management in Asia, Africa and Latin America as regional partners.

The ProAct Network (an international environmental NGO) initially shared coordination with IUCN, but was dropped from the Project in 2014 (HQ interviews, 2016).

Yet other organisations were brought into the project to implement certain activities in different countries.
- The Swiss Federal Institute for Forest, Snow and Landscape Research (SLF) was responsible for carrying out scientific research on avalanches and the protective capacity of forests in Chile;
- The Institut National de la Recherche Agronomique (INRA) was responsible for carrying out scientific research on eco-engineering for stabilisation of steep slopes in China;
- The University of Lausanne (UNIL) carried out research on reducing risk from landslides and flash floods in Eastern Nepal; and
- The Mangrove Action Project (MAP) demonstrated community-based ecological mangrove restoration (CBEMR).

In Burkina Faso and Senegal, the country offices in each of those countries implemented the EPIC project.

The project commenced in 2012 and will end in August 2017.

6.   Evaluation of the EPIC project

An independent evaluation of the EPIC project was mooted to assess progress, performance, achievements and lessons learnt to date towards EPIC's overarching project goal stated at the beginning of this chapter. The evaluation fulfils the requirement (stated in the project document) to conduct an independent review for the purpose of learning and reflection on project management, as well as operationalising ecosystem based DRR for climate change (IUCN, 2016a).

It is expected the results of this evaluation will contribute to learning under IUCN's ongoing work on ecosystem-based adaptation (EbA) and disaster risk reduction (DRR) and will also inform the design of the second phase of EPIC.

The emphasis of this evaluation, is, therefore, learning.

It therefore addresses

1) *Relevance*: the extent the project objectives corresponded to beneficiaries' needs and to IUCN's programme priorities for EbA results on the ground, and nature-based solutions in policy;
2) *Effectiveness*: the extent of progress made towards the achievement of the outcomes and outputs of the project;
3) *Efficiency*: the extent to which the project been implemented according to budgets and agreed timelines, as well as good governance indicators;
4) *Sustainability*: whether measures have been put in place to ensure benefits after project closure; and
5) *Impact*; the extent to which the conditions – at demonstration sites and in policy – are in place to enhance resilience and reduce vulnerability, while enhancing measurable ecosystem services, human well-being benefits and community governance.

It will also assess how successful the project was in each country; and attempts to discern in which country(ies) the project was most successful;

The evaluation will be used
- To provide the EPIC project coordination team evidence, analysis and lessons from the implementation of EPIC that can be used to design a second phase of the project;
- To generate technical knowledge and policy lessons that can be used to inform IUCN's policy influencing work:
- To provide implementing partners with evidence, analysis and lessons that can inform their work on eco-DRR and EbA in the future;
- To inform IUCN, the Ecosystem Management Programme and the Ecosystem-based Adaptation Learning Framework process: evidence and analysis of what has worked/ what has not worked from the EPIC project from a technical perspective.

The primary audiences for the evaluation are
- IUCN's Global Ecosystem Management Programme;
- IUCN regional staff;
- IUCN country office staff;
- University of Lausanne (Switzerland) (implementing partner for Nepal);
- l'Institut National de la Recherche Agronomique (France), (implementing partner for China);
- the Mangrove Action Project (Thailand) (implementing partner for Thailand); and
- the Swiss Federal Institute for Forest, Snow and Landscape Research (implementing partner for Chile).

Together, these parties are accountable for the achievement of the objectives specifically defined at the outset of the project.

Chapter 3: Methodology

Initially, all documentation related to the project were obtained from the Project Dropbox folder, from project coordinators, and from the programme officer for the global EPIC project, and reviewed comprehensively.

Lists for interviews were compiled in consultation with project coordinators and the programme officer for the global EPIC project, and interview schedules set up.

Three site visits were made to Nepal (October 2016), Senegal (February 2017) and Thailand (October 2016). During these visits, semi-structured interviews were conducted with a range of key stakeholders. Focus group discussions were held with communities wherever possible.

During country visits an IUCN staff member accompanied the evaluator for interviews and translated the questions and answers. (Nepal: Ms. Menaka Panta Neupane and Mr. Amit Poudyal, IUCN Nepal and Mr. Sanjay Devkota, UNIL; Senegal: Ms. Fabiola Monty from HQ; and Ms. Suparanee Kampongsun, IUCN Thailand).

For Burkina Faso, the project coordinator conducted the focus group discussions with communities, and provided feedback to the evaluator. In addition, most of the other stakeholders and staff interviews were conducted by email because of language constraints.

For Chile and China, as well as EPIC global staff, a mix of Skype and email interviews were conducted.

A total of 124 interviews were conducted.

A breakdown of the sites visited, interviews conducted (and their mode), spread of interviews (across staff, government officers, communities and others) and gender balance is presented in Table 4).

Annex 1 presents the evaluation matrix used to generate questions.

Annex 2 presents the questionnaires used and Annex 3, a full list of persons interviewed.

Box 3. Constraints to the Analyses

1. *Lack of personal observation at all EPIC sites.*
   Only three countries were visited, and this introduces a bias into the analyses, as there is much more to be learned and observed first hand on a site visit, than with many phone calls and/or emails with a range of people.

2. *Coupling the site visit with the final national workshop in Nepal was not the best use of the evaluator's time.*
   The evaluator's site visit to Nepal was arranged to coincide with the final national workshop, in the hope that all stakeholders would be present and available for interview. This was not the case as most of them wanted to listen to and participate in the workshop. Hence, the time

for interviews was curtailed to rushed lunch breaks, as no one was willing to stay on after the day's presentations and discussions were over, or in the field. The latter did not materialise for a couple of interviews in the aftermath of the landslide which delayed arrival in Pokhara.

In addition, as the agenda was fixed around the goals of the workshop, firstly, the site visits were tailored for the participants and included the two more accessible sites, not all three, so even though the evaluator was in the country, one site was not visited. Secondly, focus group discussions had not been arranged, and therefore, the only community discussions were with the three community leaders and one person from the women's group in Saunepani.

3. *Support from the project coordinators in the six countries was variable.*
The support from project coordinators/implementing partners was uneven. This may have been a consequence of the lack of staff time, and the other responsibilities of the coordinators, but this retarded the progress of the evaluation.

Support from the Programme Officer in headquarters was exemplary, but unfortunately, limited to three days a week.

4. *Necessary documentation was not always readily available.*
The DropBox folder did not contain all the EPIC documentation because of space constraints. Obtaining these in a timely manner, given the constraints listed in (3) was not easy.

5. *The language barrier in some countries may have had an impact on interview responses.*
In all instances, the translators were IUCN or implementing partner staff, who are not professional translators, and also, often intimately associated with the EPIC project. In such cases, subjectivity may have crept into the translations, as the evaluator often noticed that a single sentence question posed in English, was often expanded greatly (into many sentences) when translated into the vernacular.

In Senegal in the field, English questions were initially translated into French, then from French to the local tribal dialect for focus group discussions and the reverse carried out for the answers. Because of this chain of translations, the error margin could have been high.

In the case of some email responses, similarly translated twice — once for the questions and then for the answers — there was no control of the interview.

In all instances mentioned above, nuances may be lost.

Annex 4 presents a list of documents reviewed for this evaluation.

Table 4. A breakdown of the sites visited and interviews conducted

(Legend shown after the table)

Activity	Burkina Faso	Chile	China	T	BK	G	GC D	GC A	GC O	DJ D	DJ A	DJ O	P D	P A	P O	GS D	GS A	GS O	S D	S A	S O	KM D	KM A	KM O	Site 1	Site 2
Visit to country	X	X	X	√			√																		√	
Visit to all sites	X	X	X	X	√	√	√			√			√			√			√			√			√	√
Visit to 3 types of interventions	N/A	N/A	N/A	N/A	NA	N/A	√	√	√	√	√	√	√	√	√	X	√	√	√	√	√	√	√	√		
Focus group discussions with communities	X	X	X	Only with three community leaders			√			√			√			√			√			√			√	√
Mode of interviews	In person= 1, By phone= 1 Communities by project coordinator=70, By email= 12	By phone= 6 By email= 3	By phone= 6; By email=8	In person= 16; By email=3			In person= 23																		In person=17 By phone=2 By email=2		
Spread of interviews	IUCN staff=7; National stakeholders= 2; Local stakeholders = 9; Communities= 6 focus groups (70 persons)	IUCN staff= 5; Implementing partner=2 Local government officers= 3	IUCN staff= 6; Implementing partner= 5; National government officers =4	IUCN staff= 4; Implementing partner= 3; National government officers =3; Local government officers= 4; University personnel=2; Community=3			IUCN staff= 7; National stakeholders= 5; Local government officers= 3; Community=6 focus groups (161 people) +2 village chiefs																		IUCN staff= 6; Implementing partner= 2; Advisory Committee Members=6; National Government officer= 1 Community=13		
Gender balance for community discussions	36 ♂: 38 ♀	N/A	N/A	3 ♂:1 ♀			85 ♂:76♀																		84 ♂:9♀		

T	Tilahar
BK	Bhatkola
G	Gharelu
GC	Gauge Cherif
DJ	Djilor
P	Pethie
GS	Goudème Sidy
S	Sadioga
KM	Kamatane Mbambara
D	Diguettes
ANR	Assisted Natural Regeneration
O	Other (poultry, gardening, protected forest)

To assess the progress of proposed activities, the evaluator developed a set of logical frameworks to monitor progress of the project. The logical frameworks were analysed in terms of relevance, effectiveness, efficiency, sustainability and impact. SWOT analyses were carried out to summarise information in each logical framework.

Answers were grouped as Group 1 (communities) Group 2 (government officers, researchers, implementing partners, IUCN staff) for country-wise analysis, and a third group, Group 3 (EPIC global staff).

Answers to close-ended questions were coded for each country and exploratory data analysis carried out using SPSS. The coded data were then analysed Categorical Principal Component Analysis using the application CATPCA in SPSS. Principal Component Analysis (PCA) simplifies data, by reducing a number of correlated variables, to a set of uncorrelated components that represent most of the information found in the original variables. (Manly, 1986). By reducing the dimensionality, a few components rather than a large number of variables are viewed. PCA identifies patterns in data, and expresses the data in a way that highlights similarities and differences (Smith, 2002). PCA transforms the data into a new, lower-dimensional subspace —that is, into a new coordinate system. In this new coordinate system, the first axis corresponds to the first principal component, which is the component that explains the greatest amount of the variance in the data. PCA is also visually presented.

Answers to open-ended questions were incorporated into the narrative as needed.

Chapter 4: Results

The six constructed logical frameworks are presented in Annex 7, Annex 8, Annex 9, Annex 10, Annex 11, Annex 12, given their detail and length. Their information will be included into the narrative.

<div align="center">**Box 4. Financial analysis**</div>

It should be noted that each country had varying budget allocations (as requested at the time of writing the grant proposal) and a large range in the number of community members involved (from 50 in one country to about 6,500 in another) and differences in purchasing power parity[3]. This report does not attempt to analyse responses while controlling for these variations as this was not part of the evaluator's terms of reference.

In general, with a few exceptions, those interviewed had similar responses to questions. This is illustrated in the graphs o
Figure 12 generated from the PCA, which shows clustering. For Burkina Faso and Senegal, the clusters are tightest, indicating more similarity, whereas for China and Chile there is a greater spread. Nepal and Thailand present an intermediate state. In Thailand, there are two distinct clusters, indicating that a set of three persons thought similarly, but not markedly dissimilarly from the main cluster
Figure 12).

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[3] 'The purchasing power of a currency refers to the quantity of the currency needed to purchase a given unit of a good, or common basket of goods and services. Purchasing power is clearly determined by the relative cost of living and inflation rates in different countries. Purchasing power parity means equalising the purchasing power of two currencies by taking into account these cost of living and inflation differences' (Economics online, undated).
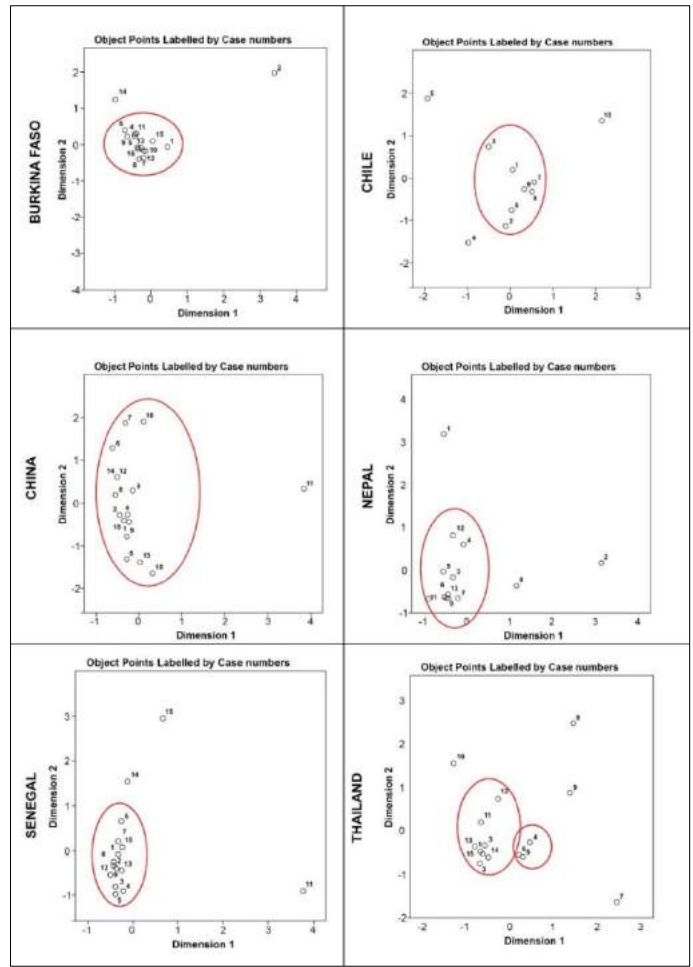
Figure 12. Clustering of responses revealed by Categorical Principal Component Analysis for the six countries

For EPIC Global staff three sets of responses were different to the rest (Figure 13).
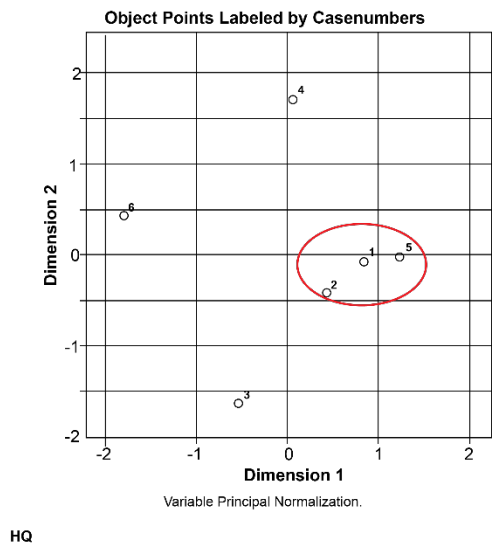
Figure 13. Clustering of responses revealed by Categorical Principal Component Analysis for EPIC Global Staff

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This evaluation is structured round five criteria: relevance, effectiveness, efficiency, sustainability and impact. The rest of this chapter will be presented under those topics. The questions relevant to each criterion is presented in Annex 1. Detailed graphs of results are presented in **Error! Reference source not found.** for reference.

1. Relevance

This section of the evaluation examined to what extent the project objectives corresponded to beneficiaries' needs; and to IUCN's programme priorities for EbA results on the ground, and nature-based solutions in policy; as well as what could be done to increase relevance at this stage.

Group 1 (communities) when asked whether the project helped to reduce impacts of extreme weather events which they discussed under another question, and also asked whether what was done through the project was what they and their family needed, overwhelmingly, said yes (Interviews, 2016, 2017).(Figure 24).

The logical frameworks presented in Annexes 5-10 combined with Table 2 and Table 3 show that the activities that have been undertaken have been clearly relevant to address ongoing climate-related issues in each country: bioengineering in slopes to reduce the impacts of landslides in China and Nepal; clear evidence to the influence of local native broad-lived forests in avalanche dynamics, particularly in small to medium-size events, by shortening their run-out distances and reducing impact pressures; traditional innovations in Burkina Faso and Senegal to combat drought and soil salinisation, respectively, and mangrove restoration in Thailand.

The extent that this project contributed to the strategic programmes of IUCN as assessed by Group 3[4] is presented in the table below. In the case of building resilience of livelihoods, the EPIC project has been successful in countries where there was community engagement. In the case of building resilience of livelihoods, the EPIC project has been successful in countries where there was community engagement. It should be noted that in Chile, even though there was no component of practice with community involvement, according to the results of the EbA Effectiveness research methodology[5], it was assessed that the EPIC project has built some foundation for local human resilience, mainly because of the awareness generated by the project on climate change vulnerabilities and risks to disasters, as well as the role of (forest) ecosystems play in mitigating these risks (IUCN, 2017a).

In terms of reducing the impacts of natural disasters, Group 3 also felt that project had met this objective.

Capacity building and increasing awareness in this project has been good (see also Chapter 5). In terms of promoting sustainable management of biodiversity to maintain ecosystem services, again Group 3 felt that this objective had been achieved by the EPIC project.

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[4] Only HQ staff were asked these questions, as Group 2 comprised government officers, implementing partners and IUCN country staff. The two former may not have known IUCN's policies.
[5] part of a BMUB-funded, IIED led project, in which IUCN is the implementer

Table 5. Project contributions to IUCN EbA objectives responses from Group 3
(Source: HQ interviews, 2016)

	To promote the resilience of livelihoods	To reduce the impacts of natural disasters such as storms and floods, on vulnerable people and ecosystems	To build the capacity of civil society and government institutions to support integrated approaches to adaptation	To increase awareness of the underlying causes of vulnerability (degraded ecosystems, poor governance, unequal access to resources and services, discrimination and other social injustices)	To promote the sustainable management and conservation of biodiversity to maintain the benefits provided by ecosystems (e.g. provision of food and shelter)
Burkina Faso	Yes, 60-90%	Yes, 60-80%	Yes, 50-100%	Yes, 50-90%	Yes, 60-90%
Chile	Not directly applicable, but see paragraph 1, this page	Not applicable	Yes, 40-100%	Yes, 60-80%	Yes, 50-90%
China	Not applicable	Not applicable	Yes, 30-80%, also one no	Yes, 30-50%	Yes, 30-70%, also one no
Nepal	Yes, 70-80%	Yes, 70-90%	Yes, 70-100%	Yes, 70-90%	Yes, 70-90%
Senegal	Yes, 60-90%	Yes, 60-80%	Yes, 60-100%	Yes, 70-90%	Yes, 60-90%
Thailand	Yes, 50-80%	Sites are too young	Yes, 50-90%	Yes, 30-80%	Yes, 50-90%

Group 3 also felt that the project contributed to the donor's policies.

Table 6. Project contributions BMUB- IKI objectives, responses from Group 3
(Source: HQ interviews, 2016)

	BMUB- IKI supports projects that test specific EbA approaches on the ground, analyse the experience gained and disseminate the results
Overall	Yes, strongly contributed at global policy levels and within BMU-IKI; different practices for different hazards; 80-95%
Burkina Faso	Yes, 60-80%
Chile	Yes, 60-70%
China	Not really, 30%
Nepal	Yes, 80-90%
Senegal	Yes, 60-90%
Thailand	Yes, 50-80%

When asked for the match between project objectives and beneficiaries' needs, for Burkina Faso the majority of Group 2 felt that the match was between 81-90%; for Chile, 71-80%; for China 71-90%; for Senegal, 91-100% and for Thailand 71-80% (Figure 25)[6].

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[6] For Nepal, because interviews were conducted during a workshop, in a rush, it was not possible to elicit a percentage. See Figure 28.

The majority of the interviewees felt that the project was flexible in adapting to on-the ground changes, as well as being responsive to changing contexts and needs (the two questions were seen as interchangeable) (Figure 26). (Only Groups 2 and 3 were asked these questions.) In fact, in Burkina Faso and Senegal, examples of introduction of biodigestors and poultry especially for women, respectively, were stated as examples of the degree of available flexibility (Interviews, Burkina Faso and Senegal, 2017).

Flexibility in Nepal was a given, with the 2015 earthquake setting back work for some months, and a landslide delaying a field trip to Pokhara meaning that a half-day wrap up workshop scheduled in Pokhara was held as a half-hour meeting in Gharelu (Interviews, Nepal, 2016). (Figure 26).

> Overall, the EPIC project has been relevant in terms of what communities needed, reflecting IUCN's EbA objectives and the donor's.
>
> Dissemination about the learnings of the EPIC project, and the EPIC project itself has been good, but uneven across the countries (See Annexes 6-10). Increasing the national visibility of EPIC in some of the countries (for example, in Burkina Faso and Senegal) while making EPIC science accessible and understandable to the general public and decision makers in others (for example, Chile and China) would help increase further the relevance of the EPIC project.

2.   Effectiveness

Figure 14 shows the number of activities proposed in workplans which were completed each year.

There is an unevenness among the five countries above in relation to completion of activities. In Burkina Faso, most of activities proposed have been completed, but there remain some that have not been achieved. In Chile, China, Nepal and Thailand, most of proposed activities have been completed. In Senegal, there are some activities still ongoing, and yet other not achieved. In Burkina Faso, the political unrest is the cause of many activities not being implemented. In Senegal, it is could be an inadequacy of prioritising activities.
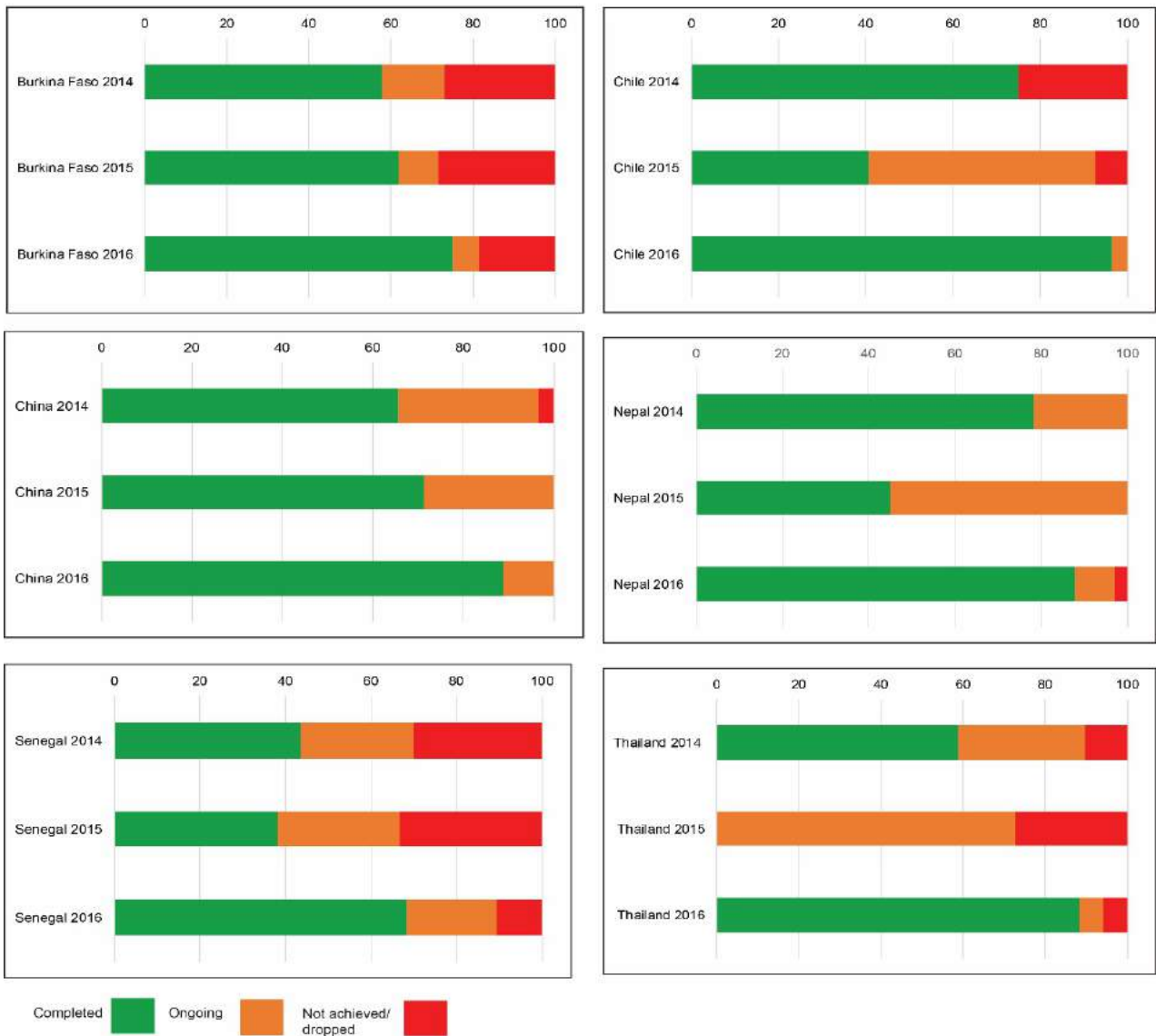
Figure 14. Number of activities proposed in workplans which were completed each year
(Source: Annual reports for all countries, 2014, 2015 and 2016)

Progress made towards achieving the global outcomes and outputs of the project are presented in Annex 5 and shows that for output 1, 4 out of 6 indicators measured well; for output 2 both were realised; and output 3, had been very successful in Chile and Thailand, and that other countries are on their way to achieving the output.

In relation to country-wise realisation of outputs, outputs 1 and 3 was realised for all six countries, while output 2 was realised for Chile, Nepal and Senegal and is ongoing for China and Thailand. It has not been achieved for Burkina Faso (Annex 6).

Most interviewees considered the EPIC project successful. A breakdown of responses by country and group, as well as for EPIC global staff, are presented in Figure 27 Figure 28 and Figure 29.

In all four countries where communities were involved, they felt that the EPIC project was successful and the modal percentage success varied from 81-90% in Burkina Faso; 90-100% in Senegal; and 71-80% in Thailand. In Nepal, the responses range from 80-90 to 100%. For Group 2 the mode varied from 71-80% in Burkina Faso (with almost an equal number of interviewees saying 81-90%); 71-80% in Chile, China and Nepal; bimodal in Senegal, with 71-80 and 81-90 equally popular responses; and tri-modal in Thailand: 61-70%, 71-80% and 81-90 (Figure 27 Figure 28 Figure 29).

Group 3 rated the overall EPIC project a success, with percentages ranging from 60-90%. For Burkina Faso, 60-80%; for Chile, 70-90%; for China 40-60%; for Nepal, 80-100%; for Senegal 80-100% and for Thailand 75-100%. (For the latter, one interviewee split the success as field=40%; policy=90-100%.) (HQ interviews, 2016).

Table 7. Highlights of what was successful about the EPIC project by country and group
(Sources: Interviews, 2016, 2017)

	Group 1	Group 2	Group 3
Burkina Faso	Support and training for addressing the issues they had identified.	Succeeded in making players identify issues and provide solutions to address them	Tool of Promoting Local Innovations (PLI) was a success
Chile	Not applicable	Bringing diverse stakeholders together	Bringing different stakeholders together for policy influence
China	Not applicable	Research for policy advocacy was good	Research was strong
Nepal	Community provided support	Communities were mobilised	Achieved the balance among science, practice and policy
Senegal	Support and training for addressing the issues they had identified	Communities have ownership of project	Tool of promoting Local Innovations (PLI) was a success
Thailand	Raising awareness	Community engagement	MoU between IUCN Thailand and Department of Marine and Coastal Resources was a huge breakthrough

Table 8. Highlights of what challenges there were during implementing the EPIC project by country and group
(Sources: Interviews, 2016, 2017)

	Group 1	Group 2	Group 3
Burkina Faso	Transport of materials, lack of technical support	Socio-political issues	Coup and political unrest were set backs
Chile	Not applicable	Location of project, in relation to IUCN, SLF and the national government.	No community fieldwork, identified innovations did not get off the ground. Local stakeholders (not communities but other local entities) were expected to implement the innovations but did not[7]
China	Not applicable	Internal issues	Site too far, no practice, no policy influence yet, so only science. Internal issues
Nepal	Physio-geography difficult	Political instability leading to recurrent changes in government officers	2015 earthquake retarded progress
Senegal	Transport of materials, timing of activities	Policy influence at national level is lacking	National policy lacking[8]
Thailand	Ownership of the project was for two people only	Time frame was too short, poor physical evidence	Issue of land tenure, combining silvofisheries and restoration, lacks a science pillar

Table 9. Highlights of what can be improved in the EPIC project by country and group
(Sources: Interviews, 2016, 2017)[9]

	Group 1	Group 2
Burkina Faso	More technical support and capacity building	Getting technical services involved earlier
Chile	Not applicable	Injection of more funds, as Chile is an expensive country
China	Not applicable	Choosing a more accessible site, involving IUCN China from the outset
Nepal	More financial resources	More involvement of women's groups from the beginning
Senegal	More resources, involve more villages	Increase geographical ambit
Thailand	Ensure that site selection is carried out on public property, so that more people could benefit.	Initial clarification of land rights

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[7] It may have been better for the EPIC project to have contributed more directly to the implementation

[8] It should be noted that ecosytem-based adaptation to climate change has been included in the National Wetland Policy of 2015.

[9] Group 3 was not asked this question for each country but overall.

Table 10. Highlights of what can be improved in the overall EPIC project
(Sources: Interviews, 2016, 2017)

	Group 3
Interviewee 1	i) IUCN should have insisted on getting 100-200,000 euros as start-up funds to hold participatory planning workshops in each country to iron out who does what when and how; ii) Being more careful about choosing partners.
Interviewee 2	Don't know
Interviewee 3	Consensus was that the overall budget was insufficient; underestimated time needed to bring stakeholders together; once on board underestimated time needed for staff to follow up. Should also have had a better mapping of high hazard areas and criteria based on that of why sites were selected.
Interviewee 4	Within country communication about EPIC should have been better in general. Science outputs must be linked to policy recommendations (for example, in China); MSDs should be strengthened.
Interviewee 5	Allocation of more staff time for implementing partners and country offices.
Interviewee 6	If the no regret character of EbA had been emphasised, it would have been easier to upscale.
Interviewee 7	Better partnerships; more participatory actions, economic valuation for all countries.

In terms of the strategy used by EPIC combining science, practice and policy there is variation among the countries. (See Figure 15)

In terms of effectiveness in the approach in delivering the desired outputs, most of the responses was that the approach was effective (Figure 30).

Despite setbacks such as the departure of a partner and reallocation of finances, earthquakes and political unrest, in general, progress toward achieving the outcomes and outputs of the project has been good, although there is an unevenness among the countries, with some countries — such as Nepal — achieving high on all three pillars of science, practice and policy; while others achieved high in science (Chile and China); others on policy (Chile and Thailand) , and yet others on practice (Burkina Faso and Senegal).
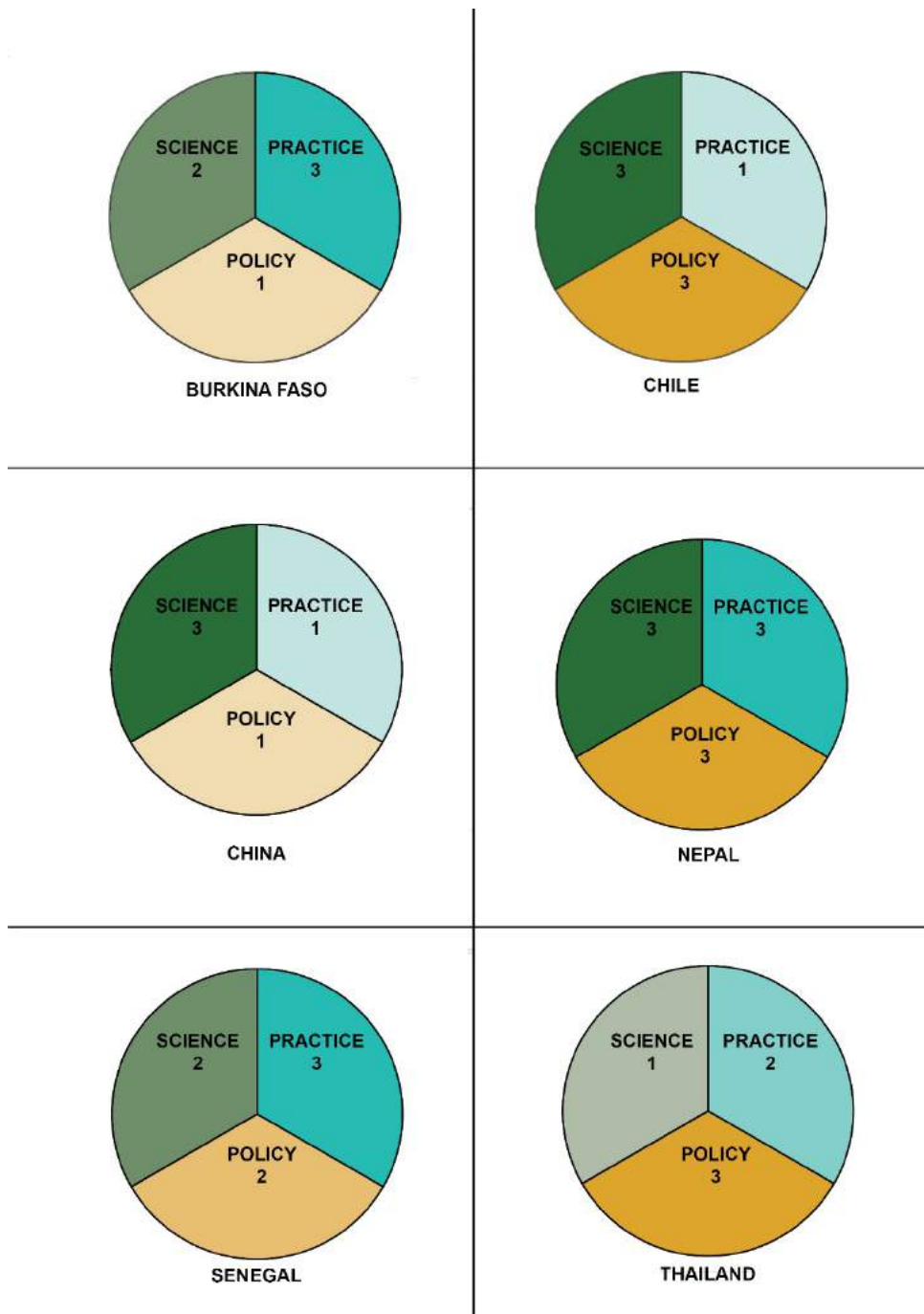
Figure 15. The three elements of the EPIC strategy

(Legend:
Science
0- 3 scored as 1 = Scientific monitoring carried out but data not fed into results
4-7 scored as 2 = Descriptive science that helped implementation
8-10 scored as 3 = Analytical science that resulted in peer-reviewed publications in scientific journals and/or influenced policy
Practice
0 scored as 1= No practice
1-5 scored as 2 = Community engagement
6-20 scored as 3= Community involvement
Policy
0-3 scored as 1 = National policy not yet influenced
4-7 scored as 2 = National policy influence has commenced
8-10 scored as 3 = National policy influence consolidated
Colours
 1= 33% opacity, 2= 66% opacity, 3= 100% opacity.)

3.   Efficiency

The evaluator did not review the finances of the project as it was not part of her terms of reference. However, interviews with HQ staff revealed that initially, ProAct coordinated the EPIC project in China, Nepal and Thailand, while IUCN was responsible for coordination Burkina Faso, Chile and Senegal. In 2014, ProAct's involvement in the EPIC project ceased. This led to a reallocation of the budget and subsequent delays. In Thailand, also, because of over-extension related to staff time by the implementing partner, there was a small reallocation of budget (HQ interviews, 2016).

In terms of good governance indicators (consensus, participation, transparency, accountability, alignment with national laws) and gender balance, the project has fared well. Much of the variation in responses comes from interviewees not knowing answers. (Figure 32, Figure 33, Figure 34, Figure 35, Figure 36, Figure 37, Figure 38.)

The roles of each player in the EPIC project have been defined generally: HQ staff provided oversight, and usually implementing partners effected actions on the ground (such as restoration of mangroves in Thailand, and bioengineering demonstration in Nepal) or carried out research (such as in Chile and China). Country office staff worked on policy advocacy.

Progress reports were due annually, and the only regular assessments were monthly Skype calls, the minutes of which are in a narrative form. These were reviewed for this evaluation, but in the opinion of the evaluator, progress reports should have been submitted more frequently (say twice a year) based on the theory of change, and an attempt made to improve the minutes of Skype calls, so that they were based on scheduled activities, their progress and problems that arose, instead of a narrative. This would have allowed for improved monitoring.

The repository for EPIC documents was a Dropbox folder, whose capacity was insufficient, so that documents were removed from the folder. In addition, Dropbox does not work in China. A much more easily accessible and comprehensive repository for EPIC documents should have been maintained.

A more rigorous self-monitoring system could have been adopted within each country (again, based on the theory of change) and between the countries and headquarters, in order that ongoing issues were identified early and corrective measures taken. To this end, HQ staff should have been strengthened, as the coordination and monitoring was overseen by a programme officer who only worked part time.

> The EPIC project has fared well in terms of good governance indicators, and project implementation in terms of disbursal of funds has been good. However, the system of monitoring between headquarters and countries, and within countries for self-assessment could have been better.

4.   Sustainability

Interviewees were asked whether the project could be replicated, and the majority felt it could be replicated, some qualifying their affirmative response. A small percentage in China felt that the project could not be replicated. (Figure 39, Figure 40).

In terms of scaling up, there was more variability in the responses, with a minority in Chile, China and Epic global staff responding that scaling up was not possible or would be difficult. (Figure 39, Figure 40). In Chile, it should be noted that despite these opinions, EPIC has set the foundation to continuing working on Eco-DRR and now IUCN SUR is working on a proposal to expand the work carried out so far.

Responses to whether the project design was appropriate to the needs at every level — national, local, community — were largely affirmative, although there were some concerns as to whether the design was appropriate for the national level. (Figure 41, Figure 42).

Communities in Burkina Faso and Senegal all said that they would continue the interventions after the project is over. (Figure 43, Figure 44). In Nepal, one of the three community leaders said that interventions would continue if there were more financial resources; and in Thailand, given the restricted land tenure of the two sites (each pond belonged to one person) there were varied responses from community members about the possibility of continuation[10] (Figure 43, Figure 44). Among Group 2, again most of responses were that interventions will continue after the project ceases (Figure 43, Figure 44).

In Burkina Faso and Senegal, the PLI tool used to identify both issues and solutions has proven to be excellent, with community members not only engaged and involved but also assuming ownership of the project (Interviews, 2017).

In terms of a mechanism that will allow for the continuation of the interventions, however, the above communities have not yet completely formulated one and believe simply that because they are motivated, the interventions will continue. (Interviews, 2017).

In contrast, all three community leaders in Nepal plan to seek funding from the local government for continuation of their activities. (Interviews, 2016).

The general mechanism mooted by IUCN staff for continuation of activities is a phase II of the EPIC project. Given the short duration of the current project, this need for a continued EPIC presence is understandable.

However, it will be necessary in the next phase to formulate an exit strategy that ensures the sustainability of interventions is formulated and established. For example, a community fund can be created, and used for the maintenance and hiring of equipment. Community members can pay a nominal sum to rent equipment and that again will feed into the fund. To this end, community members will have to be given thorough financial training.

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[10] MAP has new CBEMR project on Koh Klang commencing in Jan. 2017, and plans to follow-up on EPIC sites while on Koh Klang for the new project. This planned exist strategy allows follow-up support if needed and on-going monitoring of quadrats to continue. Both lessees of the EPIC sites are keen to see the mangroves restored on both the sites (MAP, person. comm.)

In Gharelu in Nepal, a similar process has been established: the community now sells broom grass and receives an income, a joint bank account has been opened, so that these funds may be used to extend/maintain the bio-engineering works.

> Replication, scaling up and continuation of the EPIC interventions are all possible. Long-term sustainability, however, will depend on the formulation of a mechanism that will allow communities to sustain their interventions through self-sustaining finances.

5. Impact

The criterion of impacts will be discussed under two sections: on the ground impacts and policy influence.

On-the-ground-impacts

The on-the-ground impacts of the EPIC project are summarised in the table below.

Table 11. On-the-ground impacts of the EPIC project

Country	Impact
Burkina Faso	It is unclear whether the impact of innovations has been measured before and after (APROS, 2016) — i.e., whether the establishment of Zaï/stone bunds etc. increased crop yield. Therefore, the stated benefit of EPIC interventions remains merely anecdotal (Interviews, 2017).
Chile	No on-the-ground interventions.
China	No on-the-ground interventions
Nepal	Reduction of erosion measured using LIDAR scans (**Figure 17**)
Senegal	A monitoring protocol is ready, but the impacts of the innovations (whether diguettes reduced soil erosion and salinization and or ANR increased soil fertility) have not yet been measured. Therefore, the stated benefit of EPIC interventions remains merely anecdotal (Interviews, 2017).
Thailand	Mangrove restoration takes time, and five years is too short a time frame for the impacts of such restoration to show. The EPIC sites are only 2 and 3 years old. Adding to this basic constraint, the EPIC CBEMR sites have been beset by issues related to sluice gates and goats, as well as bare patches of land on which regeneration does not occur (Annex 12). These sites combine natural regeneration and silvoculture, and provided a valuable lesson that such a combination is not recommended. Although, because of the above, the impacts of EPIC interventions are not immediately clearly visible, the indirect impact is the enthusiastic engagement of the communities and the lessees in CBEMR.

What has been an unqualified success is the creation of awareness about nature-based solutions to climate change issues. The project has invested heavily in creating awareness (See Table 21) and this has paid dividends, as the majority of persons asked responded that there have been desired changes brought about in the behaviour of communities as a consequence of the EPIC project (Figure 45).

In Chile, it is noted that local-level biosphere reserve and national-level stakeholders are now more aware of the benefits of ecosystem-based approaches to DRR and climate change adaptation, and the need for managing ecosystems sustainably (Chile Interviews, 2017).

Policy influence

The impacts of the EPIC project are summarised in the table below.

Table 12. The impacts of policy influence from the EPIC project

Country	Impact
Burkina Faso	Policy influence has been weak and is only just commencing. (Interviews, 2017)
Chile	Entries into policy have achieved in the National Plan for Adaptation to Climate Change in Biodiversity prepared by the Ministry of Environment (2014) through EPIC. Further, EPIC results will likely influence the Biobío Regional Land-Use Plan (under construction) and actions by the Ministry of Public Works in the study site (IUCN, 2015c).
China	IUCN China has built a relationship with the National Centre for DRR but policy influence has been slow, as the incorporation of scientific findings from EPIC into specific policy recommendations has not yet been made.
Nepal	Using scientific evidence and creating awareness, EPIC has managed to push the concept of Eco-DRR into the National Strategic Framework for Nature Conservation (NSFNC), an umbrella framework for conservation in the country.
Senegal	EPIC has been instrumental in catalysing the formulation of a departmental level disaster risk reduction committee and action plan through EPIC's steering committee (COMRECC), the first of its kind in Senegal. In addition, ecosystem-based adaptation to climate change has been included in National Wetland Policy (2015). EPIC Senegal also helped to strengthen the scientific knowledge of risks by conducting two studies on 1) mapping disaster risk, and 2) mapping salinization risk in the commune. The studies will provide a valuable base on which regional climate change-related decisions can be made.
Thailand	A timely and ground-breaking MoU between IUCN and the Department of Marine and Coastal Resources sets the stage for the application of EPIC's learning framework to future projects and the integration of CBEMR into government policy and practice.

As with communities, there has been a concerted effort, in general, in policy advocacy. Except in China, the majority responded that desired changes have been brought about in the behaviour of organisations because of the EPIC project, amply exemplified in the table above. (See also Figure 46).

Interviewees were asked whether, because of the EPIC project, there would be changes to policy. For China, most of responses were negative; while for Nepal, the response was that the majority hoped there would be changes. For the rest of the countries, the majority responded in the affirmative; while all EPIC Global staff responded there had been changes to policy (Figure 47, Figure 48). The discrepancy in the responses between EPIC Global

staff and the country interviewees could be attributed to two factors: a) the first is that EPIC Global staff are more aware of the bureaucratic difficulties of formulating policies in the developing world, in contrast with local government officers; and b) EPIC Global staff viewed the project as a whole, not as individual countries. To succeed in influencing national policy in three out of six countries, not only in one but several policies in two of those countries, is an excellent result.

Interviewees were also asked whether there already were changes to policy: in Burkina Faso, Chile and Senegal, the majority of the answers were affirmative; for China, negative; for Thailand, not yet; for EPIC Global staff, yes, but qualified with country-specific changes (Figure 47, Figure 48). In Nepal, there was an equal split among 'yes', 'no' and 'don't know'. (Figure 47, Figure 48).

At various discussions at the final workshop of EPIC Nepal, an issue raised repeatedly was that merely formulating policies was insufficient and that it was the implementation of such policies that was lacking. This issue is endemic to developing countries, and entirely outside the remit of the EPIC project.

In addition, there have been some unexpected impacts from the EPIC project, listed below.

Table 13. Unintended positive impacts of EPIC interventions

Country	Impact
Burkina Faso	Worked with three local NGOs and was able to build their capacity.
Chile	The National Geological Service has expressed interest in integrating the EPIC approach into their work. In addition, the Ministry of Public Works, and more recently, the National Emergency Office, have shown interest to integrate the EPIC approach. Further work is need capitalise on these opportunities.
China	The Rural Development Institution of Yunnan university is very interested in collaborating with IUCN; the China Water and Soil Conservation Association has now sought advice from IUCN to integrate soil conservation in their project sites.
Nepal	Other District Soil Conservation Officers are coming to see the demonstration sites. Others such as local NGOs/National NGOs/INGOs are also visiting the sites.
Senegal	The problem of land salinization has raised interest of other donors, such as GCF and Geneva Canton, who are both funding similar projects (based on EPIC) now.
Thailand	Raks Thai is trying to emulate CBEMR in their work. IUCN Thailand's Marriott Hotel mangrove planting project at Tubpla, Phang Nga has now included a CBEMR component.

Creation of awareness about Eco-DRR has been the EPIC project's strongest impact.

On-the-ground impacts of EPIC have been varied, with clear evidence of the impact of EPIC interventions shown in Nepal. In Burkina Faso, Senegal have not (or not yet) been monitored scientifically. In Thailand regeneration has been slower than expected.

The impact of policy influence in Nepal, Chile and Thailand has been exceptional. In Senegal policy influence at the local level has been excellent and has extended to the inclusion of EbA in the National Wetland policy.

SWOT analysis

Shown below are the results of the SWOT analysis of the logical frameworks for the six countries.

Table 14. EPIC BURKINA FASO – SWOT Analysis

STRENGTHS	WEAKNESSES
1. **Community involvement:** A total of 6,533 persons from six villages have been involved. 2. **Community decision-making and project management.** The PLI tool used carried out a VCA with communities to identify issues but then went on to elicit solutions for those issues from communities. Village Development Committees meet to assess progress of activities and develop an action plan for the next year. 3. **Practice has been excellent.** Several traditional innovations (zaï, stone bunds, ANR) plus activities that promote organic gardening have been implemented successfully in six villages. 4. **Capacity building of communities:** Three community training programmes on seed production techniques and composting, including training of trainers. 5. **Cross-community learning:** A study tour of the Senegal EPIC project allowed for cross community learning 6. **Community ownership.** The above has led to community ownership.	1. **The science element is descriptive and does not analyse the results of the interventions** 2. **Impacts of interventions have not been scientifically monitored:** There is only anecdotal evidence to assess the impact of the innovations. 3. **Policy influence is moderate at local level and is only beginning at national level.** 4. **Information dissemination about the EPIC project has been limited.** Dissemination has been limited to in country presentations among stakeholders, and at the WCC. Dissemination to the general public through media is lacking.
OPPORTUNITIES	THREATS (CHALLENGES)
1. **Developing EPIC Phase II**	1. **Political instability:** The coup and subsequent government changes has retarded the progress of several activities.

Table 15. EPIC CHILE– SWOT Analysis

STRENGTHS	WEAKNESSES
1. **Generation of science-based knowledge has been excellent.** Sectors of the study area where natural hazards represent a threat for communities have been identified, a historical record has been developed of past natural disturbances threatening communities; and susceptibility maps at a local scale for sectors of the study area where natural hazards represent a threat for communities or infrastructure have been developed. Simulations have showed that forests considerably reduce the impact pressure on the road as well as the spatial extent of the runout from avalanches. 2. **Brought diverse stakeholders together for policy influence:** Seven workshops were organized by EPIC, with the participation of around 250 people; in addition, members of the EPIC team participated and presented the EPIC Chile case study in five international events (about 300 people), and one national event with around 50 people 3. **Entries and potential entries into policies.** Entries into policy have achieved through the EPIC into the National Plan for Adaptation to Climate Change in Biodiversity prepared by the Ministry of Environment (2014) which included EPIC as an 'exemplary measure of adaptation to climate change that contributes to the strengthening of the National System of Protected Areas' (National Climate Change Adaptation Plan, 2014. The EPIC results will likely influence the Biobío Regional Land-Use Plan (under construction) and actions by the Ministry of Public Works in the study site. 4. **Knowledge dissemination has been very good.** About 15 news stories have been uploaded on various websites and social media has been also used effectively.	1. **No community involvement, so therefore no practice.** However, it should be noted that in Chile, even though there was no community involvement, according to the results of the EbA Effectiveness research methodology, it was assessed that the EPIC project has built the base for local human resilience, mainly because of the awareness generated by the project on climate change vulnerabilities and risks to disasters, as well as the role of (forest) ecosystems play in mitigating these risks. See under relevance. 2. **There has been no progress in the implementation of the innovations identified during the VCA and PLI** This is attributed to the lack of resources. 3. **Review of Ecosystem Services of forests is limited** and does not cover the gamut of ecosystem services.

OPPORTUNITIES	THREATS (CHALLENGES)
1. **Potential collaboration with National Geology and Mining Service (SERNAGEOMIN),** which is developing a National Geological Hazards' Map. It has expressed interest in integrating the EPIC approach into their work. In addition, the Ministry of Public Works is interested in using the results of EPIC for actions in the study area; and the National Emergency Office (ONEMI) has shown interest in the approach, and they can include it in the multi-stakeholder platform on DRR as an approach to work on.	1. **Location of IUCN office and the EPIC site.** The IUCN office is in Ecuador, the EPIC consultant was based in Santiago while the project site was in Chillán. This posed administrative problems.

Table 16. EPIC CHINA– SWOT Analysis

STRENGTHS	WEAKNESSES
1. **Generation of science-based knowledge has been excellent.** The EPIC case study for China has investigated the use of eco-engineering for the stabilisation of steep slopes. The study has analysed the growth, spatial occupation and root structures of relevant plant species on steep slopes that can potentially alleviate the risk of shallow landslides and reduce soil particle runoff, wind erosion and erosion caused by water runoff due to floods and heavy rain. It has modelled the influence of vegetation on slope stability and developed a tool to aid engineers choose plant species suitable for fixing soil on slopes. In addition, it has outlined and tested a method for identifying shallow landslides in the target region using GoogleEarth. 2. **IUCN China has built a relationship with the National Centre for DRR.** 3. **Knowledge dissemination:** Over 10 peer-reviewed scientific papers have been published or are being published based on the	1. **Internal dichotomy within the project.** The EPIC project has been implemented as two clear elements of science and policy. 2. **Policy influence has been slow.** Although the science was strong, the research findings have not yet been incorporated and specific recommendations on slope restoration have yet to be made to influence policy**.** 3. **The science is not yet in an accessible form for policy makers and laypersons.** The scientific results have been disseminated at scientific fora. Decision-makers have been targeted with general information about the EPIC project in China, EbA and Eco-DRR, and not with the scientific results from the EPIC project. Dissemination using other communication tools (such as videos) is only just commencing 4. **No community involvement, therefore, no element of practice**

results of the EPIC project and many presentations have been made at scientific fora and for decision-makers. There has been some cross-country learning with EPIC Nepal.	
OPPORTUNITIES 1. **There are several possible entries for collaboration:** The Rural Development Institution of Yunnan university is very interested in collaborating with IUCN; the China Water and Soil Conservation Association has now sought advice from IUCN to integrate soil conservation in their project sites. INRA is leading discussions with colleagues concerning the future scientific collaborations in the field of forest ecology between INRA and the Chinese Academy of Science.	**THREATS (CHALLENGES)** 1. **Location of EPIC project site was not easily accessible.**

Table 17. EPIC NEPAL – SWOT Analysis

STRENGTHS	WEAKNESSES
1. **Community involvement:** Although not even across the sites, mobilisation and involvement has been very good. A total of 178 focus group discussions (involving 444 people); 32 meetings (involving 327 people); 4 discussions (involving 225 people) were held to mobilise the communities. 2. **Cross community learning:** One community leader provided technical buttressing for the other communities. 3. **Generation of science-based knowledge:** This has been exceptional. There is now empirical evidence *inter alia* a) to show that bio-engineering interventions reduce soil erosion; b) to pin point plant species that provide maximum soil holding capacity; c) to document the role of earthen roads in contributing to increased erosion and landslides (2 sites); and d) to demonstrate *via* a cost-benefit analysis, that eco-safe roads, in the long term, are a more	1. **'Preaching to the converted':** There were no high-level representatives (at the national level) from the Department of Roads or the Village Development Committees, both of which have a profound bearing on road construction, and need to be educated on the benefits of eco-safe roads.

cost-effective option.

4. **Practice has been excellent.** Restoration (although at a very small scale) of ecosystem services at demonstration sites has been achieved. Degraded slopes have been stabilized and soil properties have been improved because of bio-engineering; in Tilahar, a 95% reduction in soil erosion has been observed (supporting services have improved); provisioning services have also been improved as communities are now receiving benefits from harvesting grass.

5. **Capacity building of communities.** In addition to (1), bio-engineering training was provided to 66 persons. A training manual has been published and disseminated.

6. **The convening power of IUCN Nepal**. Four national workshops involving 326 national and local level government officers have been held where successful discussions have been conducted. Through various meetings and workshops held at local and national levels, EPIC effectively raised awareness on eco-DRR issues and approaches; through concrete examples from the pilot sites, policy makers could understand eco-DRR principles and to appreciate it as an alternative to hard infrastructure

7. **Knowledge-sharing:** At least 52 people not involved in the project have visited the demonstration sites to see bio-engineering in action.

8. **Knowledge dissemination:** Project knowledge has been disseminated excellently. The generated scientific knowledge has been shared at seven international conferences/ workshops; in Nepal, information about eco-safe roads, the EPIC project and bio-engineering has been disseminated excellently by mass media.

OPPORTUNITIES

1. **WWF's Hariyo Ban Program** works in two priority geographical areas: the Terai Arc Landscape (TAL) and the Chitwan-Annapurna Landscape (CHAL). It works on three core interwoven components

THREATS (CHALLENGES)

1. **Political instability:** frequent changes in senior government officials — in fact the current DG DSCWM had taken up the position only two days before the final national workshop.

a) Biodiversity conservation; b) Payments for ecosystem services including REDD+, and c) Climate change adaptation. It is engaged in i) Integrated sub-watershed management and DRR; ii) Integrated river basin management and eco-DRR; iii) Climate adaptation and DRR; iv) Building eco-DRR into disaster recovery and reconstruction; v) Building capacity in other organizations to implement green recovery and reconstruction and vi) Developing demonstration sites of best practices. Hariyo Ban has also carrying out road restoration/ bioengineering in two Payments for Ecosystem Services projects in two catchments – Phewa and Marshyangdi. The work will be continued in Phase II of Hariyo Ban. There are opportunities for synergies for the EPIC and Hariyo Ban Program to work together over the remaining life of EPIC and carry this work forward at policy level; Hariyo Ban will run till 2021, so it has more time to make a difference. 2. **Other DSCOs and other organisations (JICA; ICIMON) are coming to see the demonstration plots.**	2. **Lack of implementation of policies/lack of coordination:** These are problems endemic to the South and South Asia. 3. **Bureaucracy:** It took a year to get the MoU between IUCN and the DSCOs signed. 4. **Climate constraints – heavy rain / drought**

Table 18. EPIC SENEGAL – SWOT Analysis

STRENGTHS	WEAKNESSES
1. **Community involvement:** A total of 3,244 persons from six villages have been involved. 2. **Community decision-making and project management.** The PLI tool used carried out a VCA with communities to identify issues but then went on to elicit solutions for those issues from communities. 3. **Capacity building of communities:** 5 community workshops for 70 people, two specific training programmes (ANR, halophytes for nurseries; recovery of salinised soils) for 90 people. 4. **Practice has been excellent.** Several traditional innovations	1. **Impacts of interventions have not yet been scientifically monitored:** There is only anecdotal evidence to assess the impact of the innovations. 2. **Information dissemination about the EPIC project has been limited.** Dissemination has been limited to in country presentations among stakeholders. Intercountry dissemination is limited to the WCC. Dissemination to the general public through media in only through a single video.

(diguettes and ANR) plus other livelihoods generating activities have been implemented successfully in six villages. 5. **Community ownership.** The above has led to community ownership. 6. **Policy influence at local (Foundiougne) level is excellent and is now extending to the national area.** The first ever DRR plan for the country has been formulated under COMRECC in the Fatick Region. In addition, ecosystem-based climate change adaptation has been included in National Wetland Policy (2015).	
OPPORTUNITIES 1. **EPIC Phase II is already underway** through a 9.7-million-dollar project being carried out through the GCF	**THREATS (CHALLENGES)** 1. **A single project coordinator is running the EPIC project from the capital which is far away from the project site.**

Table 19. EPIC THAILAND – SWOT Analysis

STRENGTHS	WEAKNESSES
1. **Policy influence has been exceptional.** The convening power of IUCN Thailand has been excellent. IUCN Thailand established a Marine and Coastal working group in 2014 and played a role in the development and subsequent adoption of the Coastal Zone Management Act in Thailand. The working group Served to review the DMCR Act and provide inputs during its formulation. An MoU has been signed between IUCN Thailand and the DMCR valid for 5 years from 2016. 2. **Community involvement has been good**, with some 57-people trained in CBEMR. Besides the large number of community members (both men and women) involved in physical work over 300 international volunteers also participated when physical labour was required. 3. **Information dissemination has been excellent.** CBEMR has	1. **The regeneration of mangroves in the EPIC sites has been slower than expected.** The combination of natural regeneration with silvofisheries has not been a success. Both sites have had a series of recurring issues (goats, sluice gates and bare patches where nothing grows) so that regeneration has been slow. 2. **The sites belong to two persons, and therefore direct benefits are for two households only.** This is series drawback preventing community ownership and this issue was raised in community interviews. 3. **Creation of awareness about CBEMR appears not to be completely effective.** Even though many of the community extol the benefits of CBEMR, some comment that they will either dig deep channels to promote silvoculture; plant seedlings, rather than allow for natural regeneration; not engage in hydrological

been promoted at about 7 in country workshops, and over ten intern-country events. Videos and posters and hand books have also been disseminated. In addition, many groups and individuals visited the sites to learn about CBEMR, including three DMCR government groups. The EPIC CBEMR sites have been included in general mangrove-related research of a post-doctoral fellow, two PhD students and 2 Master' degree students for research. A CBEMR blog has been established to share field work methodology and lessons learned to a broader audience.

4. **Because of a new CBEMR project that commenced in January 2017, monitoring on the sites can be continued till 2020.** This is possible for another 5 years using both quadrats for scientific monitoring in combination simpler time-lapse photography monitoring.

alteration; or restore his/her pond purely for aquaculture — all indicating that their commitment to CBEMR is not complete

4. **The promotion of CBEMR and EPIC have been interchangeable, so it is difficult to tease out the impacts of EPIC work.**

OPPORTUNITIES

1. **The DMCR has a site which needs restoration and has requested that IUCN carries out this exercise.** This will allow for the application of the EPIC learning framework to this restoration and will lead to the integration of the community into planning and implementation of mangrove restoration.

THREATS (CHALLENGES)

1. **The complex land tenure system of Thailand**. Most previous encroachment by shrimp aquaculture on state mangrove forest have occurred by outside investors and to a lesser degree by local communities. Currently, the DMCR is taking back encroached land, acquiring large encroachments first. At the present, the Department of Marine and Coastal Resource is a main agency responsible for the state-owned mangrove forest management, restoration, maintenance and conservation. Therefore, the restoration will be planned and led by DMCR, yet the local people are encouraged to join the planting activities of restoration and conservation by DMCR's invitation. Government land can only be restored by the government (DMCR as the lead agency in charge of mangrove forest), or by the invitation or permission of the government. According to the Preserved Forest Act, which legally authorises only the government agency (Royal Forest Department

	at that time and later, the Department of Marine and Coastal Resource-2015) to manage the mangrove forests, the EPIC project in Thailand could not find any state-owned degraded mangrove land available for restoration at the beginning of the project-2012. Non-government organizations and local people need legal permission from the government to restore or conduct any activity in mangrove areas. Therefore, in order to avoid any legal dispute with the government, the project decided to work on two sites held with several different types of legal land tenure documents.

6. Overall evaluation by country and element evaluated

Country	Relevance	Effectiveness	Efficiency	Sustainability	Impact	Science	Practice	Policy	Knowledge dissemination	Next steps
Burkina Faso	Very relevant	Very successful practice, effective at local level	Governance indicators are good, project management is good, but self-monitoring needs improvement	Replicability, scaling up and continuation of activities are likely.	Impact on innovations have not yet been measured scientifically. Policy impact is only at local level.	Descriptive science only	Very strong practice, with community ownership of interventions	Ongoing at local level, but not yet expanded to national level	Could have been much better	EPIC Phase II being developed
Chile	Very relevant	Very effective policy, science has been used effectively to influence policy.	Governance indicators are good, project management is good, but self-monitoring needs improvement	Replicability, scaling up and continuation of activities are possible, but some interviewees did not think scaling up was possible.	Strong impacts of policy influence, with one policy already including the Eco-DRR and several departments showing interest in including the EPIC results and approach into their policies and plans	Very strong science that clearly linked forests in the various impacts of avalanches.	None	Strong impacts of policy influence, with one policy already including the Eco-DRR and several departments showing interest in including the EPIC results and approach into their policies and plans	Very good, with dissemination extending to mass and social media	Follow-up actions with interested stakeholders in Eco-DRR: such as SERNAGEOMIN, MOP and ONEMI. Also, working on the proposal for expanding the work of EPIC
China	Very relevant	Effective science, which, however, has not yet been translated to policy	Responses regarding governance indicators show some negatives, dichotomy in project management	Some negatives in responses for replicability, scaling up and continuation	Not much impact yet as science has not been translated into policy.	Very strong science that provides clear evidence on which species are suitable for slope stabilisation and erosion control.	None	Policy influence ongoing,	Focused on dissemination in scientific fora and about EbA and Eco-DRR for stakeholders, but science has not been simplified and disseminated in a way that it can incorporated into implementation and policy	Several possible collaboration points with Chinese counterparts.

Country	Relevance	Effectiveness	Efficiency	Sustainability	Impact	Science	Practice	Policy	Knowledge dissemination	Next steps
Nepal	Very relevant	Effective science, successful practice, effective policy influence	Governance indicators are good, project management good, self-monitoring is good	Replicability, scaling up and continuation of activities possible, but there are also a few negatives in the answers for scaling up and continuation.	Strong impacts on the ground, as some ecosystem services have been restored, strong impacts in policy influence	Very strong science; results have been fed into policy discussions	Very strong practice, with community ownership of interventions	Strong impact: the concept of Eco-DRR into the National Strategic Framework for Nature Conservation (NSFNC)	Excellent across the board dissemination (from scientific fora to mass media) of the issues, EPIC interventions and impacts	• Green Climate Fund proposal has been submitted to enhance Climate Resilience of Vulnerable Communities and Ecosystems in Gandaki River Basin, Nepal • EbA Effectiveness project (IIEED, WCMC, IUCN and UNEP) will integrate the EPIC learning's and outputs for policy advocacy • Up-scaling the mountain EbA project (TMI and IUCN) will consolidate and replicate EPIC's good practices • Nepal Risk Reduction Consortium will provide platforms at the national level to include Eco-DRR concept
Senegal	Very relevant	Good descriptive science that fed into successful practice, effective policy influence at local and national level	Governance indicators good, project management good, self-monitoring yet to be tested	Replicability, scaling up and continuation of activities are possible, but there are also a few negatives in	Impact of innovations have not yet measured scientifically. Policy impact strong at local level and EbA	Good descriptive science of the baseline situation.	Very strong practice, with community ownership of interventions	Policy impact strong at local level and ecosystem-based adaptation to climate change has been included	Dissemination could have been better.	EPIC phase II has already been already mooted

Country	Relevance	Effectiveness	Efficiency	Sustainability	Impact	Science	Practice	Policy	Knowledge dissemination	Next steps
				the answers for scaling up and continuation.	has included in the National Wetland's Policy (2015)			in the National Wetland Policy (2015)		
Thailand	Very relevant	Very effective policy, practice beset by various issues, has included scientific monitoring but the results have not yet been reported in annual reports.	Governance indicators excellent, self-monitoring has been poor	Dependent on the whims of two owners. However, both are respected in the community, and they did give their ponds for restoration, so it is hoped that the interventions will continue	On-the-ground impacts have been slow to be visible as natural regeneration has been slow.	Scientific monitoring has been carried out and will continue till 2020. However, these results have not been fed into annual reports.	There is community engagement but this, given the land tenure issues, has not translated to community ownership.	The signing of the MoU between the DMCR and IUCN is an exceptional opportunity to push Eco-DRR into the national policy arena.	Strong dissemination across the board, but difficult to tease out how much is CBEMR and how much is on EPIC	Upscaling of CBEMR in Krabi will be carried out by MAP through another project. It is hoped that the CBEMR principles will be incorporated into the major conservation players such as Conservation International, The Nature Conservancy, and Worldwide fund for nature though the Global Mangrove Alliance. IUCN Thailand will work closely with the DMCR

Chapter 5. Lessons Learned and Recommendations for Improvement

The EPIC project, in its short duration of implementation, has yielded some valuable lessons learned.

1. Involving communities in identifying solutions leads to better community ownership.

Vulnerability and Capacity Assessment (VCA) is 'an investigation that uses various participatory tools in order to understand the level of people's exposure to (and capacity to resist) natural hazards at the grass-roots '(International Federation of Red Cross and Red Crescent Societies 2006). It is now widely used in assessing vulnerability to climate change (Gough, 2010; International Federation of Red Cross and Red Crescent Societies 2006; Oxfam, 2012; and van Aalst et al., 2008).

VCA was used in the EPIC project in five of the six countries[11] (VCA reports, in Dropbox). In three of the five countries (Burkina Faso, Chile and Senegal), the VCA was taken a step further, and communities not only identified vulnerabilities to hazards but also presented solutions to the identified issues (IUCN, 2015). This methodology is called the Promoting Local Innovations (PLI) toolkit designed by the CDE that uses elements of the Climate Resilience Evaluation for Adaptation through Empowerment (CREATE) methodology to analyse risks and determine local capacities or 'innovations[12].'

Unfortunately, there has been little or no progress with these innovations in Chile (Annual report EPIC Chile, 2016). However, in Burkina Faso and Senegal traditional local strategies to cope with drought and salinization, respectively, were identified and implemented successfully (see Chapter on results) (Annual Reports for Burkina Faso and Senegal, 2016; direct observation for Senegal). These strategies include zaï and stone bunds in Burkina Faso and diguettes in Senegal. When questioned, 100% of those community members interviewed responded that they will continue with the innovation in both countries (See Chapter on Results).

In Burkina Faso and Senegal, village development committees evaluate progress annually and prepare action plans for the next year, strengthening the decision-making process commenced with the PLI (Interviews, 2017).

Recommendation 1: Ensure that in future projects on Eco-DRR and EbA, as well as in EPIC phase II, the PLI approach is used in all sites to ensure that the ownership of the project centres on communities.

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[11] In China, the VCA took the form of a comprehensive assessment of landslide vulnerability in the Salween River valley which measured landslide erosion along seven unpaved road segments in the upper drainage basin and calculated sediment delivery rates into the Salween River

[12] In Nepal, although the PLI approach was not used, communities have been active in implementation and in two of the three villages, have assumed ownership of the project.

Figure 16. Promoting Local Innovations in Burkina Faso and Senegal
(Top left: VCA workshop, Burkina Faso; top right: Stone bunds, a local innovation in Burkina Faso (both © Sylvain Zabre/IUCN; Bottom left: VCA workshop Senegal (© El Haj Ballé Seye/IUCN), bottom right: diguettes (anti-salt bunds) in Senegal (© Sriyanie Miththapala)

2.   The approach used in EPIC of working with a range of stakeholders from grass-roots levels to the national level achieves results

The approach of working at grassroots, local and national levels has been very successful. The table below shows whether or not the EPIC project was successful in engaging the gamut of stakeholders in each country.

Table 20 Engagement of stakeholders

Country	Community	Local government	National government
Burkina Faso	√	√	Some engagement
Chile	X	√	√
China	X	X	√
Nepal	√	√	√
Senegal	√	c	√
Thailand	√	√	√

In both Burkina Faso and Senegal, EPIC has been extremely successful at the local level. In fact, in Senegal EPIC has been instrumental in catalysing the formulation of a local level (in the Fatick region) disaster risk reduction plan through COMRECC, the first of its kind in

Senegal (Interviews, 2017) and that ecosystem-based adaptation to climate change is included in the National Wetland Policy (2015).

In Burkina Faso, the expansion to the national level is only occurring now.

In Chile, local-level biosphere reserve and national-level stakeholders are now more aware of the benefits of ecosystem-based approaches for DRR and climate change adaptation, and the need for managing these ecosystems sustainably (see section below). Unfortunately, there was no community engagement. In the Biosphere Reserve Nevados de Chillán — Laguna del Laja where the EPIC project was sited, the community was not a typical one as seen in Asia or Africa. The residents of the biosphere reserve were people from all over Chile who had come to settle there. The EPIC project managed community cohesion, but could not translate this into community action or self-regulation (Interviews, 2016).

In China too, community engagement was lacking. The reasons for this are many — such as the practice that government officials who translate everything for researchers, so that objectivity is not assured, and the complexities of working in the field in China (Interviews, 2016).

In Nepal and Thailand, the EPIC project has achieved an excellent balance of working with a range of stakeholders (Direct observations; Interviews 2016).

Recommendation 2: Ensure that in future projects on Eco-DRR and EbA, as well as in EPIC phase II, this approach of working with a range of stakeholders is applied diligently across all sites.

3. Investing in capacity building across the range of stakeholders brings valuable dividends

The EPIC project has been very effective in raising awareness across the range of stakeholders with whom the EPIC worked.

In all countries, several workshops were held to raise awareness of local stakeholders on climate change and disaster risks in their area, and nature-based approaches to respond to those risks (Buyck, 2016). In addition (in all countries except China and Chile), capacity-building workshops have also been held to train communities on a range of topics: nursery development and maintenance and assisted natural regeneration in Burkina Faso and Senegal, bioengineering in Nepal and CBEMR in Thailand (Buyck, 2016). The PLI approach (see point 1) in Burkina Faso and Senegal went a step further to catalyse communities to find their own local solutions to issues raised and implement them.

In Chile, China, Nepal, Senegal and Thailand, the concept of eco-DRR has now been accepted and is in the national governments' lexicons (Interviews, 2016, direct observations). In Burkina Faso, the concepts of Eco-DRR and EbA have been absorbed into the local and regional governments (Interviews, 2017).

Table 21. Number of workshops conducted under EPIC in different countries
(Source: information obtained from project coordinators

Country	Number of awareness workshops (reach in parentheses)/Other targeted training		
	Local level government	National level government	Community
Burkina Faso	3 (67)	1 (53)	3 (20)
Chile	8(73)	8 (94	8 (104)
China	2 (25)	1(70)	none
Nepal	3 (local level=78; national level=48		Bioengineering training 1 (66); 89 focus group discussions benefitting ~ 444 people
Senegal	4 (36)	1 (60)	4 (70)
Thailand	2 (62)	2 (88)	2 (44)

Recommendation 3: Ensure that in future projects on Eco-DRR and EbA, as well as in EPIC phase II, capacity building of is carried out across the range of stakeholders.

4. The strategy of using communities to direct implementation and using science to measure the impacts of implementation and inform policy is excellent, and follows the tried and tested IUCN knowledge-empowerment-governance core strategy of the past.

The case study in three villages in Nepal is an excellent example of how science-generated knowledge showed clearly the reduction of erosion after interventions (See Figure 17), and also showed the economic benefits of eco-safe roads over grey roads (See Figure 19,Figure 20) These data have been fed into policy discussions through various meetings and workshops held at local and national levels, effectively raising awareness on eco-DRR issues and approaches, as an alternative to hard engineering solutions. Close engagement with the Department of Soil Conservation and Watershed Management under the Ministry of Environment and Forests has resulted in this agency becoming convinced of the efficacy of eco-safe roads and in advocating enforcement of environmental regulations (See Annex 8, Nepal logical framework for sources, IUCN, 2015; IUCN 2017).
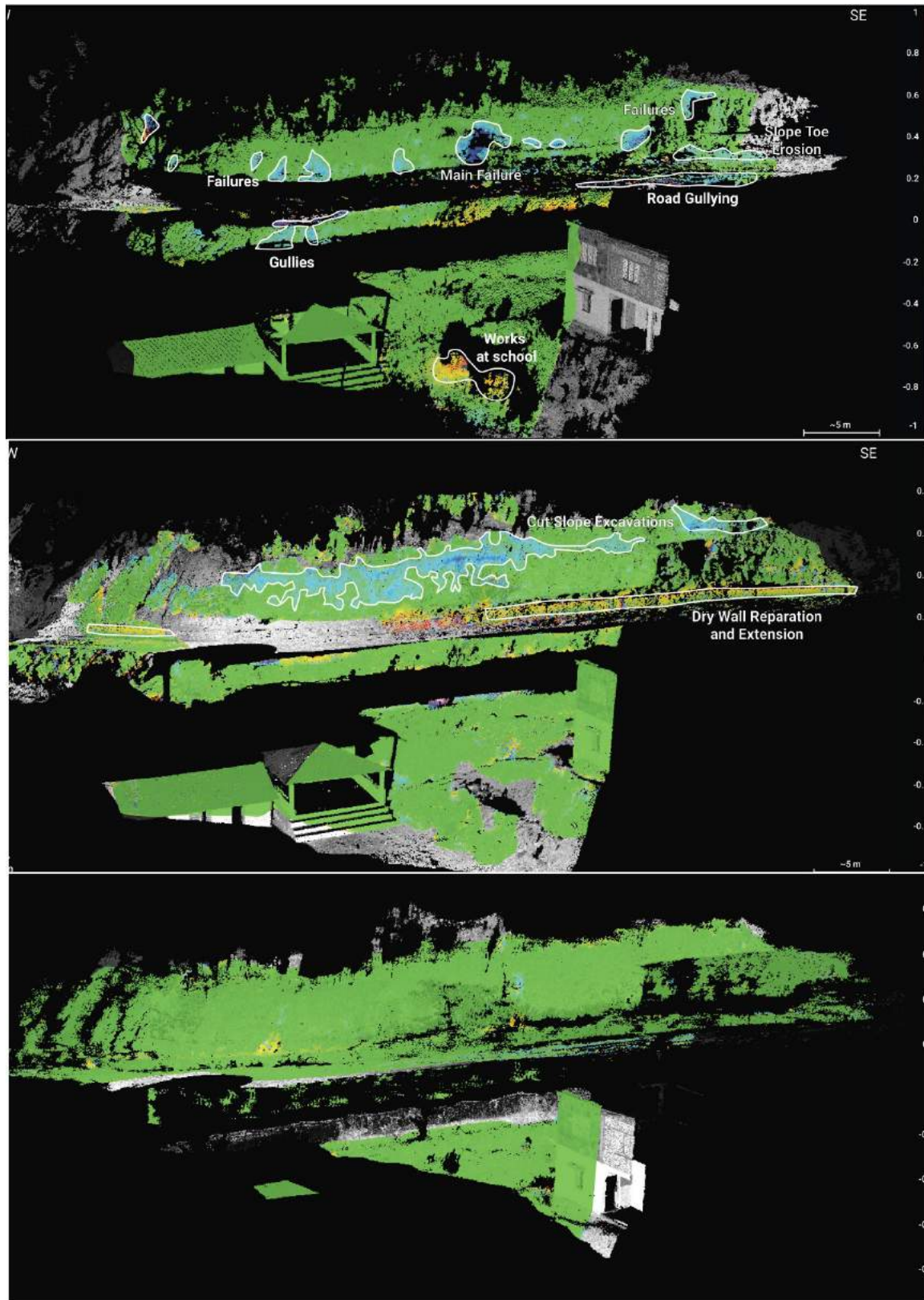
Figure 17. Lidar scans taken in Tilahar top: 2014, before interventions, showing the extent of erosion; middle: 2014, showing the interventions; and bottom: 2015, after the interventions (Source: IUCN and UNIL, 2016).

In Chillan, Chile, there could be multiple entries into policy as a consequence of the EPIC project. Simulations based on dendrochronological and other data have shown unequivocally that forests considerably reduce the impact pressure on roads, as well as the spatial extent of the runout from avalanches (Casteller et al., 2016). Based on these results, policy and planning influence has been achieved in

- the National Plan for Adaptation to Climate Change in Biodiversity prepared by the Ministry of Environment (2014) which included EPIC as an 'exemplary measure of adaptation to climate change that contributes to the strengthening of the National System of Protected Areas' (National Climate Change Adaptation Plan, 2014);
- the EPIC results will likely influence the Biobío Regional Land-Use Plan (under construction) and actions by the Ministry of Public Works in the study site;
- the proposed Climate Change Adaptation Plan in which Eco-DRR and EBA have been included. EPIC has contributed to this action through its multi-stakeholder capacity-building action on these topics, engaging around 150 national and 270 local stakeholders;
- There has been growing interest from the Ministry of Public Works (MOP) on the results of the EPIC avalanche study in the Valle de las Trancas, to assess potential sustainable alternatives (such as green-grey measures) to reduce the risks of avalanches in the road that connects the valley with the upper part of Nevados del Chillán. In addition, they have shown interest in learning more on green-grey or nature-based solutions;
- The National Platform on Disaster Risk Reduction from the National Emergency Office (ONEMI) has shown an initial interest in integrating the Eco-DRR approach into its multi-sectorial platform; after EPIC workshops.

In Thailand, the EPIC project has been very timely. The IUCN country office signed a memorandum of understanding (MoU) with the Department of Marine and Coastal Resources (DMCR). This is valid for five years commencing 2016 (Annual reports, interviews 2016). This MoU in itself is significant but also paves the way for the application of EPIC's learning framework to future projects and the integration of CBEMR into government policy and practice. The DMCR has shown interest to undertake joint research on CBEMR on state lands and to explore opportunities to scale-up the technique in a provincial demonstration site. (Interviews, 2016). The Marine and Coastal Resources Act enacted in 2015 includes clauses for community participation. Through the establishment of a demonstration site, it is hoped that the CBEMR concept will be accepted eventually by the government; This will lead to integration of the community into planning and implementation of mangrove restoration.

Recommendation 4. Ensure that in future projects on Eco-DRR and EbA, as well as in EPIC phase II, a balance among the three elements of the EPIC strategy — generating science-based knowledge; practising ecosystem-based adaptation and influencing policy — is achieved in all countries.

5. The EPIC project interventions on-the ground may have been small, but there are already several entry points for future work, that extend to a larger scale

One of the remarkable outcomes of the EPIC project is that interest has been generated among national and regional stakeholders and this could mean future scaled-up collaborations. The table below details the entry points for each country and region.

Table 22. Entry points — at national and regional levels — for the continuation of the EPIC approach

Country/Region	Entry points for the continuation of the EPIC approach (national)	Entry points for the continuation of the EPIC approach (regional)
Burkina Faso	- Permanent Secretariat of the National Council for Emergency Relief and Rehabilitation - Permanent Secretariat of the National Council for Sustainable Development - National Institute for Environment and Agricultural Research - University Aube Nouvelle - Local administration (gouvernorate and high commissioners) - Collectivités territoriales - National Programme for biodigesters	*Regional workshop on biodiversity, ecosystems and disaster risk reduction* — a win-win approach. (Mauritius 2016); *A Regional workshop for Africa*: 6th Africa platform and 5th ministerial meeting for DRR (Relief kit project) 16 countries from East, Southern, West and Central Africa; 36 representatives of at least 2 ministries of each country, representatives of Regional Economic Commission (SADC, EAC & IGAD), scientists, practitioners (other NGOs, international organizations) *5th Central Africa Platform for DRR* – with GFDRR, among recommendations is ensuring the link between DRR national strategies with other strategies and sector programmes, including the sustainable development objectives, initiatives for restoration of degraded and deforested land within the Bonn challenge, INDC in the context of the framework UNCCC, and the Aichi targets as part of the CBD; *Western Africa Coastal Management Programme*: Countries asked for technical assistance to determine the key factors increasing the vulnerability of the people, ecosystems, and assets along the coast, making them especially susceptible to the consequences of climate-related and man-made pressures; *The Sahel and West Africa Program (SAWAP) and BRICKS (Building Resilience through Innovation, Communication and Knowledge Services):* SAWAP is an umbrella programme, that supports the implementation of a country-driven vision for integrated natural resource management for sustainable and climate-resilient development in 12 countries in West Africa and the Sahel using a landscape approach; BRICKS is a regional project that connects the 12 country project teams and partners working on the Great Green Wall Initiative, and provides opportunities for south-south learning; using M&E tools, geospatial services, best practices, peer review; and portfolio-wide communication .
Chile	- The EPIC results will likely influence the Biobío Regional Land-Use Plan (under construction) and actions by the Ministry of Public Works in the study site; - The proposed Climate Change Adaptation Plan in which Eco-DRR and EBA have been included. EPIC has contributed to this action through its multi-stakeholder capacity-building action on these topics,	Scaling up the Mountain EbA to Colombia (to be confirmed) Others: Euroclima?

Country/ Region	Entry points for the continuation of the EPIC approach (national)	Entry points for the continuation of the EPIC approach (regional)
	engaging around 150 national and 270 local stakeholders; • There has been growing interest from the Ministry of Public Works (MOP) on the results of the EPIC avalanche study in the Valle de las Trancas, to assess potential sustainable alternatives (such as green-grey measures) to reduce the risks of avalanches in the road that connects the valley with the upper part of Nevados del Chillán. In addition, they have shown interest in learning more on green-grey or nature-based solutions; • The National Platform on Disaster Risk Reduction from the National Emergency Office (ONEMI) has shown an initial interest in integrating the Eco-DRR approach into its multi-sectorial platform; after EPIC workshops. • Green Climate Fund proposal with the Ministry of Environment and FAO (accredited agency) and IUCN (implementing partner) to examine ecosystem-based solutions to climate change and road development; • EbA Effectiveness project (IIEED, WCMC, IUCN and UNEP) supports the consolidation of EPIC's foundation;	
China	• GEF State Forest Farm Project with State Forestry Administration: integrate Eco-DRR considerations and approaches to the management of the state forest farms (planning, restoration, vegetation management etc); • Training programmes with Chinese	• *6th Asian Ministerial Conference for Disaster Risk Reduction* - Influencing the regional DRR policy framework: A collective effort from the participants of the RELIEF KIT workshop who influenced their respective country delegations, led to the integration of ecosystem based approaches in the Sendai Asia Regional Implementation Plan. The New Delhi Declaration document also mentioned the importance of recognising links between environment and development; • *Disaster Environment Working Group in Asia (DEWGA)*: will provide platforms at the

Country/Region	Entry points for the continuation of the EPIC approach (national)	Entry points for the continuation of the EPIC approach (regional)
	Society of Forestry: technical training on NBS and Eco-DRR; • National Disaster Reduction Center: Promotion of Eco-DRR • State Oceanic Administration and State Forestry Administration: Mangrove conservation	national and regional level and include relevant government representatives from both DRR and environment areas; • *UNISDR*: IUCN has been invited to be a member of the Inter-Agency working group to support the Asian countries in implementation of the Sendai framework; • *SDG Forum for Asia*: the 5th Asia Pacific Forum for Sustainable Development will be themed around Nature Based Solutions. UNESCAP has already invited IUCN to assist in designing the framework for the next Forum
Nepal	• Green Climate Fund proposalhas been submitted (IUCN- Accredited agency, NTNC and DSCWM- with Department of Soil Conservation and Watershed) to enhance Climate Resilience of Vulnerable Communities and Ecosystems in Gandaki River Basin, Nepal • EbA Effectiveness project (IIEED, WCMC, IUCN and UNEP) will integrate the EPIC learning's and outputs for policy advocacy • Up-scaling the mountain EbA project (TMI and IUCN) will consolidate and replicate EPIC's good practices • MoU with different universities (TU and AFU) created interest in Eco-DRR and students supported by the EPIC project will further apply this concept in their future carrier and profession, • Nepal Risk Reduction Consortium will provide platforms at the national level to include Eco-DRR concept	Same as for China
Senegal	• Senegalese Agricultural Research Institute (ISRA) and CNRF: research on plant species adapted to salt soils • National Institute of Pedology (INP): implementation of natural solutions to reduce the impacts of land degradation • IST-Laboratory of remote sensing:	Same as for Burkina Faso

Country/ Region	Entry points for the continuation of the EPIC approach (national)	Entry points for the continuation of the EPIC approach (regional)
	mapping of natural hazards • Ecological Monitoring Center (CSE): creation of databases on climate risks	
Thailand	**Promotion of CBEMR** • Raks Thai (CARE) Thailand is developing joint CSR projects to learn about mangrove /CBEMR (March 2018); • CBEMR multi-pond demonstrations sites funded by TBSF and SE to commence • Charitable Trust (HK) has just started funding a CBEMR community network, video and website; • RECOFTC Forest Landscape Restoration Forum, Bangkok one-day Forum: CBEMR Case Study and Learning Station on Mangrove and Coastal Restoration will be co-hosted by MAP, MFF, IUCN (Sept. 2017); • IUCN Oceans and Climate Change (Berlin), Global Marine and Polar Programme (GMPP) assisting with blog on mangroves and restoration; • USFS is interested in co-funding video on mangrove restoration /CBEMR • WI CBEMR training in Senegal and/or Tanzania is possible • Global Mangrove Alliance (GMA) CI, WWF, TNC launched at Ocean Summit 6 June: Scaling up initiatives to protect and restore a life-saving coastal ecosystem • Policy recommendation booklets National Reform Committee representative MONRE Permanent Secretary and Minister	Same as for China and Nepal

Recommendation 6: *Ensure that these possible avenues are explored thoroughly and consolidated at the very earliest.*

6. Increasing the duration of the project would have enabled have enabled easier progress

A longer duration for the EPIC project would have enabled more progress. Firstly, EPIC was a project that needed the involvement and collaboration of local and national government officers. (See point 2 above.) Engaging with governments in developing countries takes time, as was observed in EPIC. For example, in Nepal, although the Epic project commenced in 2012, the MoU with the Ministry and Department of Watershed Management and Soil Conservation were signed only in 2014 (Progress report, 2014). Such delays are endemic to developing countries and cannot be avoided.

Secondly, in the countries where there was restoration of ecosystems or ecosystem services, in one way or another, the duration of the project was insufficient to show evidence of the restoration of various ecosystem services, although, in Nepal, provisioning services are beginning to improve, as communities in Gharelu are now selling Broom grass used from stabilising slopes as an extra source of income (Direct observation, Interviews, 2016). In Thailand, natural regeneration has been slower than expected, so the benefits of ecosystem services (other than some provisioning services that are now provisioning) are not yet observed (Direct observation, 2016).

Recommendation 5: Ensure that for future Eco-DRR and EbA projects and for EPIC phase II, the time frame provided for the project is adequate.

7. The project would have benefitted from a clear strategy that would have ensured sustainability of interventions

Even though the majority of respondents felt that project interventions were sustainable, there is no mechanism established that will allow for the continuation of the interventions.

The general mechanism mooted by IUCN staff for continuation of activities is a phase II of the EPIC project. This is entirely understandable as EPIC was meant to establish pilot projects.

In Nepal community leaders plan to seek funding from the local government for continuation of their activities.

However, for the future, it is necessary that a proper exit strategy — a mechanism that ensures the sustainability of interventions — is formulated and established, at least in the next phase. For example, a community fund can be created, and used for the maintenance and hiring of equipment. Community members can pay a nominal sum to rent equipment and that again will feed into the fund. To this end, community members will have to be given thorough financial training.

In Gharelu in Nepal, a similar process has already been established. (See Lesson 6).

Recommendation 6: Ensure that for future Eco-DRR and EbA projects and for EPIC phase II, a clear exit strategy that includes a mechanism for sustainable continuation of project interventions is included as part of project activities.

8.   Dissemination about the learnings of the EPIC project could have been better.

In many of the interviews, responses fell into the 'don't know' category, indicating that that knowledge dissemination could have been improved.

Dissemination about the learnings of the EPIC project, and the EPIC project itself has been good, but uneven across the countries (See Table 14, Table 16, Table 17, Table 18, Table 19). In Nepal, dissemination, across the range of stakeholders — government officers and communities as well as the general public — has been excellent. In Thailand, there has been strong dissemination across the board, but difficult to tease out how much is CBEMR and how much is on EPIC. In China, there has been focused on dissemination in scientific fora and about EbA and Eco-DRR for stakeholders, but the science has not been simplified and disseminated in a way that it can incorporated into implementation and policy.

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Box 5. The need for a dedicated communications officer

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In Nepal, a dedicated communication officer ensured that targeted messages related to the EPIC project were disseminated periodically at a national level through mass media, raising EPIC's visibility among decision makers and lay persons alike (personal observation). In contrast, in Burkina Faso, Senegal, and Chile implementation of all EPIC activities was carried out by one IUCN officer sited far away from EPIC project locations. In Thailand, the implementing partner was a two-person NGO.

At HQ, the project coordination was handled by a full-time project director, a part-time programme officer and a part-time junior scientist.

Increasing the national visibility of EPIC in some of the countries (for example, in Burkina Faso and Senegal) while making EPIC science accessible and understandable to the general public and decision-makers in others (for example, Chile and China) would help increase further the relevance of the EPIC project.

In order to achieve better dissemination, a communication plan should be formulated and implemented within the project duration.

Recommendation 7: Ensure that for future Eco-DRR and EbA projects and for EPIC phase II, a communication plan — including knowledge dissemination through mass media, at scientific fora and to government officials — is formulated and implemented within the project duration. Ensure also that adequate staff time is provided for a specialist in communication.

9. Better integration of best practices related to biodiversity and environmental safeguards could have further enriched the interventions.

The 'heartland of IUCN is *biodiversity conservation, emphasising both tangible and intangible values of nature* (IUCN, 2017b) . . . IUCN [is] an incubator and trusted repository of best practices, conservation tools, and international guidelines and standards' (IUCN, 2017c emphasis added).

Both Eco-DRR and EbA approaches are anchored in healthy ecosystems that provide a range of life-sustaining ecosystem services to humans (Reid and Alam, 2014). Biological diversity underpins ecosystem services (MEA, 2005). Thus, any activity that damages biodiversity or has the potential to damage it — that is, any of the drivers of ecosystem change — undermines the efforts of Eco-DRR and EbA.

The figure below shows the links among ecosystem services, human well-being, drivers of ecosystem change and natural hazards are shown in the figure below.
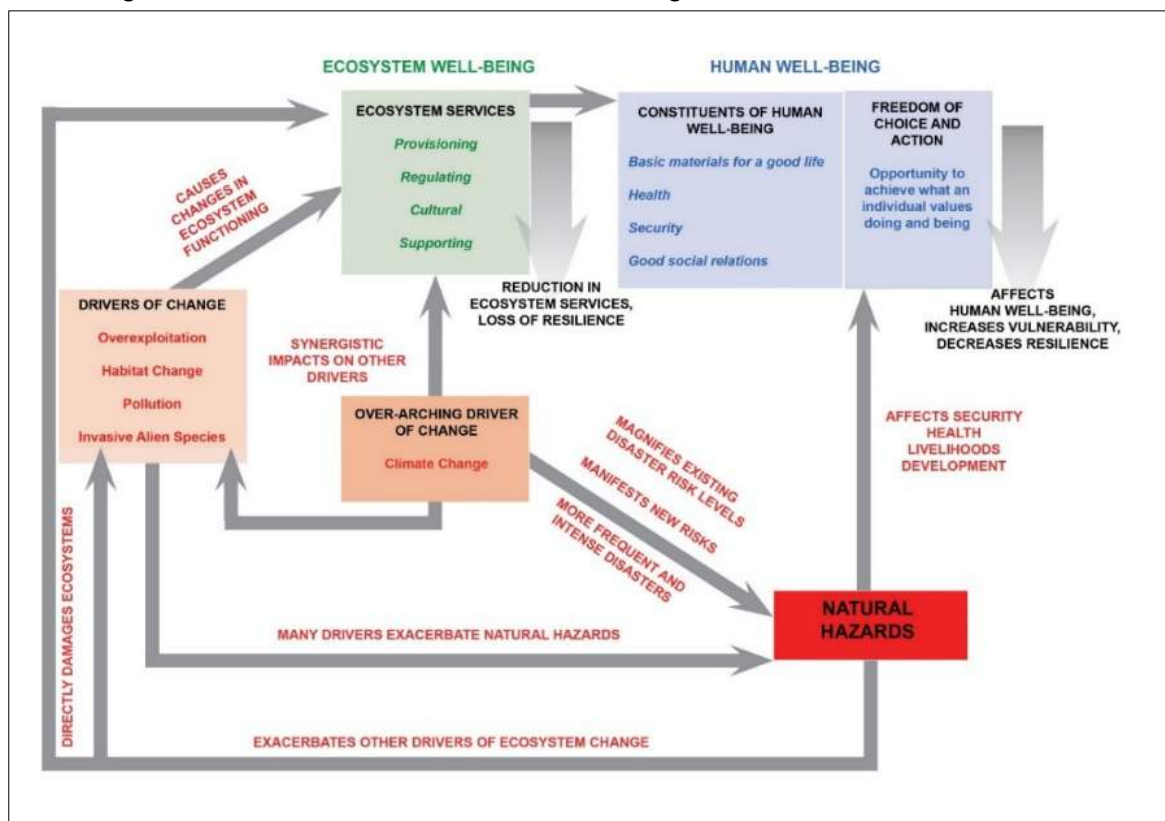
Figure 18. The links among ecosystem services, human well-being, drivers of ecosystem change and natural hazards
(Source: compiled from MEA, 2005; Lo, 2016; IUCN, 2014)

These links among biodiversity conservation and natural disasters and the stated 'best practices of IUCN' could have been better integrated into the EPIC project.

For example, the charcoal production activity (which generates carbon dioxide) in one of the Senegal villages (Direct observation, 2017), could have been offset by an activity that

promoted and engrained the habit of planting native trees. Alternatively, suitable hardy and fast-growing native species could have been grown as live fences, pruned and used as animal fodder, fuel wood, pole wood, potential shade, medicines and as a source of collective income generation for the community (Dolbeare, 2016).

The use of native species in restoration should always be preferred. For example, when a framework for identifying species for eco-engineering was sent up in Yunnan Province in China, an initial screening for two criteria was carried out: a) the species must be present on disturbed sites in the region; and b) must not be invasive. Of the selected species, although two were introduced species (*Agave americana* and *Jatropha curcas*) they had been already been used in for slope stabilisation, and so were included. The results of the analyses showed that although root mechanical properties of these two species were suitable, they had a poor capacity to occupy soil and unsuitable physiological traits, showing that they were not the best species for slope restoration.

When vegetable gardening is introduced, training should focus on organic gardening that shuns chemical pesticides and fertilisers, as was exemplified in Burkina Faso.

Some livelihoods activities— such as poultry farming — were introduced to reduce pressure on forest resources (specifically fuelwood collection when income is insufficient to buy gas for cooking). Although the income earned has been recorded, the reduction in fuelwood extraction from forests — the link to conservation — is not elucidated.

Additionally, in most reporting (for example, baseline reports) the links between ecosystem services and human well-being are confined to provisioning services (livelihoods enhancement) and regulating services (protection from extreme weather events). Other links of supporting services (such as primary production and nutrient cycling) and cultural services have not been included (See Cortés-Donoso et al., 2015). In annual reports, these linkages are not reported.

It is noted that many of the players in the project are not biologists and therefore, are not entirely familiar with the basics about ecosystems, the gamut of ecosystem services, the links between ecosystem well-being and human well-being, the threats to biodiversity and the links to climate change and natural disasters (Figure 4).

Recommendation 8: *For EPIC phase II or any other Eco-DRR or EbA project, it is essential that an investment be made at the inception workshop for the whole project, to bring diverse project staff (IUCN coordinators and implementing partners) on to the same page to work together to agree upon*

a) working definitions of important concepts related to biodiversity conservation, such as the range of ecosystem services, and drivers of ecosystem change;
b) basic 'do and don'ts' that ensure environmental and social safeguards; and
c) set environmental standards for the overall project which should maintained through the duration of the project.

These should be turned into a hand book that can be provided for continual reference.

10. More climate-science data, could have been used to climate-proof field interventions, whenever possible within the financial and time limitations

The focus of EPIC is Eco-DRR and EbA, which encompass extreme weather events and adaptation to climate change, respectively. Yet, in some of the EPIC projects, more attention should have been paid to climate change.

For example, in Chile, the modelling software used different scenarios such as avalanche volume and return periods, as well as the climate variables associated with the occurrence of disturbance events. However, different climate change scenarios are lacking in the simulations although a predicted outcome for the EPIC project in Chile was the 'identification of the climatic variables associated with the occurrence of disturbance events and a determination on how climate change predictions could modify this activity.' However, it should be noted that a study on local perceptions on forest ecosystem services, climate change and risks to disasters, as well as a study to examine the opportunities of Eco-DRR in the institutional and legal framework were carried out.

In China, extensive examination has been carried out to a) develop a conceptual framework to help local communities choose species to stabilise slopes; and b) select species suitable for slope stabilisation. However, assessments specifically testing the resilience of the selected plant species to observed climate-related changes in temperature or IPCC scenarios are lacking.

Recommendation 10: Ensure that in future Eco-DRR, EbA projects and EPIC phase II, ensure that all activities are climate-proofed.

11. Economic valuation is a strong bargaining tool in promoting Eco-DRR

The Millennium Ecosystem Assessment (MEA) (2005) provided an explicit framework that linked human well-being to ecosystem well-being and, in turn, a 'bridging concept' between biological and social sciences (Braat and Groot, 2012). It became possible to frame clearly environmental issues in terms of economics and value ecosystem services in monetary terms (Braat and Groot, 2012). Such valuation has proven to be invaluable in convincing decision-makers about the importance of conserving ecosystems. Valuation is a particularly important tool in terms convincing politicians of the benefit of Eco-DRR over hard engineering solutions. For example, in the Asia-Pacific region, economic losses from natural disasters have been about 75 billion USD recent years (Monty et al., 2016). The cost of maintaining hard engineering solutions (dykes) (grey infrastructure) in Vietnam was estimated to be 7.3 million USD, but protecting 12,000 ha of mangroves (green infrastructure) along the coast, would cost only one million USD (Monty et al., 2016). The figure below illustrates how valuation can illustrate clearly the benefits of Eco-DRR.
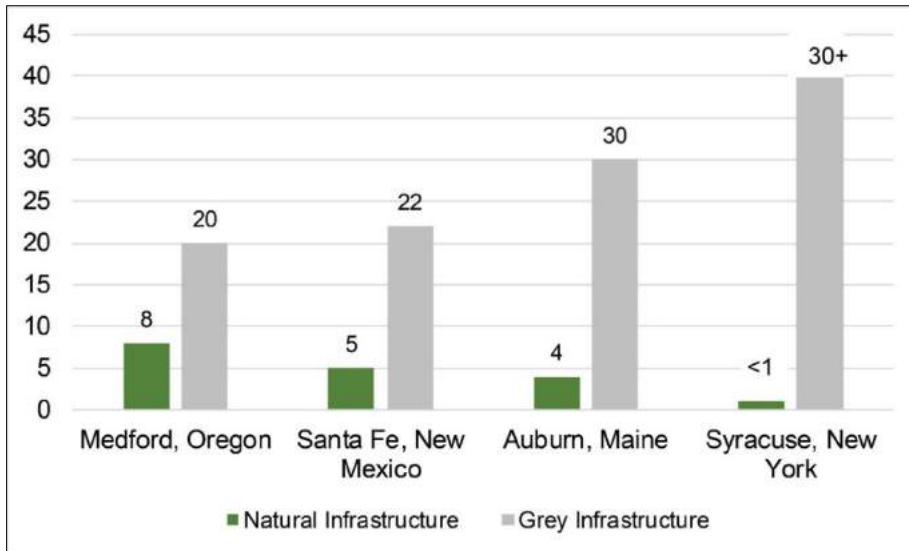
Figure 19. Comparison of the costs of grey and green infrastructure in the US
(Source: WRI, 2013).

In Nepal, the EPIC project demonstrated the value of 'eco-safe roads' and showed that although the initial cost of eco-safe roads is higher than for grey roads, over a period of 40 years, the estimated cost of maintaining them is much less than that of grey roads (assumptions: normal monsoon, no yield losses). The average annual maintenance cost for grey roads was 50,600 Nepalese rupees net present value (NPV) compared to 8,500 NPV for the eco-safe roads. In a worst-case scenario of a higher than normal monsoon and agricultural losses, the cost of grey roads becomes significantly higher even at the outset (IUCN and UNIL,2016).
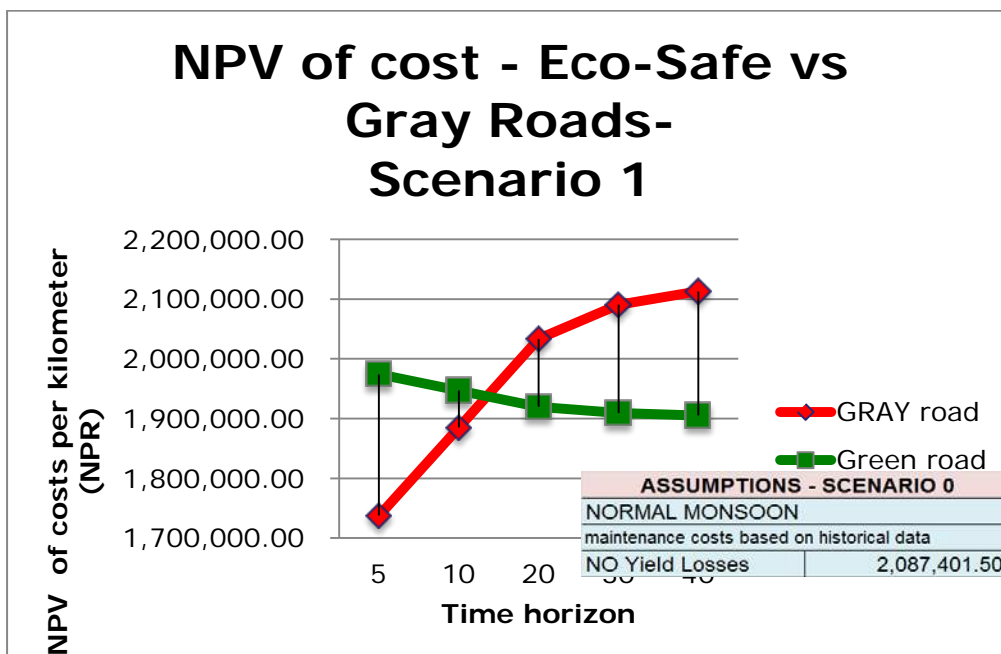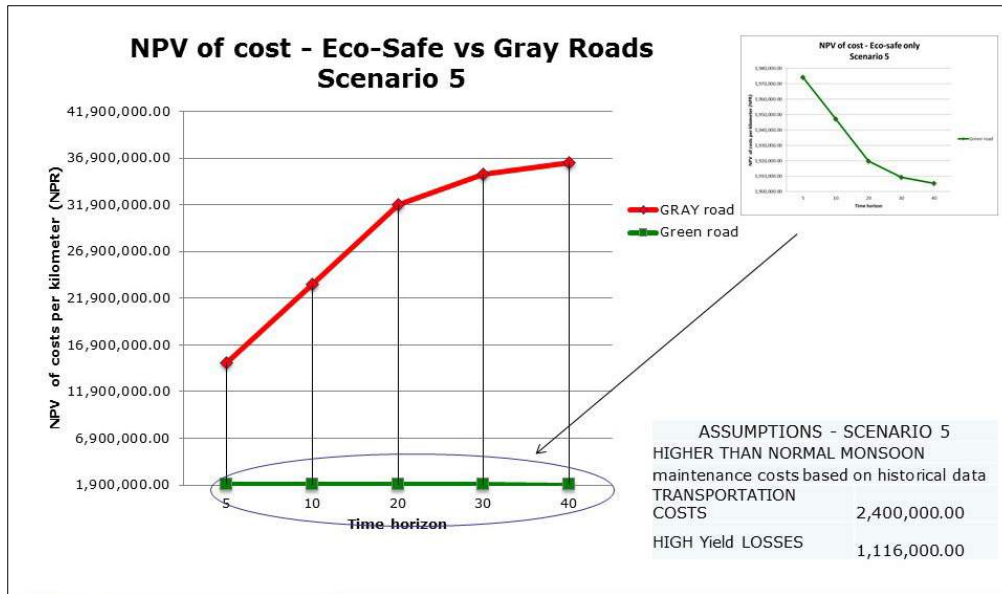
Figure 20. Cost-benefit analysis of grey versus eco-safe roads in Nepal
(Source: IUCN and UNIL, 2016)

In Thailand, a similar study lacked information that could be used in policy discussions (King and Cordero, 2015).

It is heartening to note that economic evaluation is planned for Senegal before the project ends.

In Chile and China, the EPIC focus was only research so that valuation was not relevant, although for EPIC Chile had presented a limited review of forest ecosystems.

Recommendation 4: *Ensure that ecosystem valuation is included in future Eco-DRR and EbA projects and for EPIC phase II, as the generated knowledge can be used to make an economic case for Eco-DRR and EbA.*

12. Inter-country learning provides excellent opportunities technological and practical assistance

A successful study tour of EPIC Senegal of 30 practitioners from Burkina Faso was conducted in 2016. The objective was to exchange and share experiences between both countries. A similar reverse visit from Senegal with six community representatives was also carried out in 2017.

One of the UNIL consultants in Nepal — Sanjaya Devkota — visited the Biosphere Reserve, in Chile in 2015, and wrote a report on landslides. In addition, various members of INRA participated in the inception workshop of EPIC Nepal, as well as visited the demonstrations sites, and offering technical inputs on bioengineering (China interviews, 2016).

The above exchanges were successful in terms of technological and practical assistance, but were limited to four countries. Meetings with all six countries have been limited to one mid-term meeting held in 2014 and another, in June 2017.

Overall cross-country learning, not only in terms of technical exchange, but also project management, implementation, monitoring and reporting has, therefore, been very limited. The project, as a whole, would have benefited from an annual meeting of relevant headquarters staff, project coordinators and implementing partners. This would have served to identify issues and provide countries with solutions to problems.

The dearth of such meetings, like many of the observations raised above, may be a consequence of the lack of financial resources.

Recommendation 7: *Ensure that for future Eco-DRR and EbA projects and for EPIC phase II, annual meetings of all involved IUCN staff and implementing partners are budgeted for, and that the agenda for such meetings ensures that the progress is evaluated, issues are raised and solutions suggested for their resolution.*

Such annual meetings can be held in a different country each year, and field visits to implementing sites included in the agenda, so there is also hands-on learning.

Overall Recommendation 8: *An overall recommendation that follows from all the above is that IUCN may do well to draw upon the pool of 16,000 IUCN commission members to select a technical advisory committee who can be called upon to strengthen future projects by a) reviewing reports twice a year, and b) being available for consultation should a specific problem arise for any future Eco-DRR, EbA and EPIC phase II projects.*

Conclusions

The single most valuable contribution of the EPIC project has been the creation of awareness about Eco-DRR in the countries in which it was implemented, in particular, among government ministries and communities. In Chile, China, Nepal and Thailand, the concept of eco-DRR has now been accepted and is in the national governments' lexicons (Interviews, 2016, direct observations). In Burkina Faso and Senegal, the concepts of Eco-DRR and EbA have been absorbed into the local and regional governments (Interviews, 2017; direct observation).

It has also been extremely successful in bringing together diverse stakeholders.

Despite the constraint of time, the EPIC project has also provided limited evidence of the value of ecosystem restoration in re-establishing vital ecosystem services. The benefits of ecosystem restoration compared to grey infrastructure for disaster risk reduction can only be assessed *a posteori*, after an extreme weather event.

It is also laudable that given its short duration, in general EPIC has been so successful in its policy advocacy.

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Annexes

1. Annex 1: Evaluation matrix

EVALUATION CRITERIA	KEY EVALUATION QUESTIONS	SUB QUESTIONS	INDICATORS	DATA SOURCES / METHODS
Relevance	To what extent do the project objectives continue to correspond to beneficiaries' needs and to IUCN's programme priorities for Ecosystem-based adaptation results on the ground, and nature-based solutions in policy? What could be done to increase relevance at this stage?	1) Establish whether or not the design and approach of the project are relevant in addressing the identified needs, issues and challenges for local beneficiaries. (Reconstruct a theory of change if necessary.) 2) To what extent is the project contributing to the strategic policies and programmes of IUCN and that of the donor? 3) Is the project design appropriate to meeting IUCN's strategic objectives and to the beneficiaries needs? 4) Has the project been responsive to changing contexts or needs?	1. Log frame analysis 2. Analysis from Interviews 3. Observations	Project design documents, including: Project proposal (incl. 4 annexes); EbA/DRR learning framework; baseline and inception reports for each country; Vulnerability and Capacity Assessment (VCA) reports; Interviews
Effectiveness	What progress has been made towards the achievement of the outcomes and outputs of the project?	1) Are the activities being implemented in accordance with the project plans? If not, why? 2) How effective are the approaches and structures in delivering the desired outputs? 3) How can they be improved? 4) What is the role you played in this project? 5) Was this project successful in your opinion? 6) Rough estimate of how much it was successful. (rough percentage) 7) If so why? What is about the project that was successful?	1. Log frame analysis 2. Analysis from Interviews 3. Observations	Monitoring mission reports (from 2015 in Thailand, Nepal and China); trip reports for each country; Annual project reports (to BMU). Interviews, field visits.

		8) What were the challenges you faced in implementing this project? 9) What did not work in the project? 10) Why did it not work?		
Efficiency	Has the project been implemented efficiently, according to budgets and agreed timelines?	1) Are the funds being spent in accordance with project plans and using the right procedures? 2) Have there been any unforeseen problems in terms of resources (technical and financial) allocation and utilization? How well were they dealt with? 3) What have been the roles of IUCN HQ management/coordination and the partners, and are they appropriate? 4) Is there an effective process, built into the management structure for self-monitoring and assessment, reporting and reflection? How could it be made better? 5) Was the approach truly consensus-oriented? 6) Was is truly participatory? 7) Assume it was carried out according to national policies and laws? 8) Was it carried out transparently? 9) Was there in built accountability? Were things done reasonably on time, within budget and to the satisfaction of the stakeholders?	1. Accounts 2. Log frame analysis 2. Analysis from Interviews 3. Observations	Workplans from 2013, 2014 and 2015; Annual project reports (to BMU).
Sustainability	What measures have been put in place to ensure benefits after project closure?	1) Is the approach used likely to ensure a continued benefit after the end of the project? 2) Are all key stakeholders sufficiently and effectively involved? The evaluation team will be expected to consider criteria of governance for supporting socio-ecological resilience.	1. Analysis of interviews	Interviews, field visits

		3) Are alternative or additional measures needed and, if so, what is required to ensure continued sustainability and positive impact? 4) Was the project design inclusive: gender balance – automatic with out-migration, but were there an effort to be inclusive? 5) Is the project design appropriate to the needs at every level - national, local, community? 6) Can the approach be replicated/ scaled up? 7) What can be improved in the project? 8) To what extent do the project objectives continue to correspond to beneficiaries' needs 9) Has the project been responsive to changing contexts or needs? 10)Will the interventions continue after the project is completed? 11) Is there a mechanism for the continuation to be possible? 12) If so, what is it? 13) If not, what is needed?		
Impact	Are the conditions in place to achieve impact both on the ground and in terms of policy influence?	1) Is the project bringing about desired changes in the behaviour of people and institutions? 2) What changes in implementing nature-based solutions for disaster-risk reduction and ecosystem-based adaptation have been observed so far? 3) What changes in recognition by governments and policy-makers' of ecosystem management as an effective strategy for DRR and Climate Change Adaptation? 4) Have there been any unintended positive or negative impacts arising from particular outcomes/results?	1. Analysis of interviews 2. Recommendations from government officials	Interviews, field visits

2. Annex 2: Questionnaires used for the evaluation

For government officers

1. What is the role you played in this project?
2. Was this project successful in your opinion?
Yes/ No
3. Rough estimate of how successful it was. (rough percentage)
4. If so why? What is about the project that was successful?
5. What were the challenges you faced in implementing this project?
6. What did not work in the project?
7. Why did it not work?
8. Has the project been flexible in adapting in relation to on-the-ground issues?
Yes/ No
9. How effective was the approach in delivering what was wanted?
Not effective/effective/Very effective
10. Was the approach truly consensus-oriented?
Yes/No
11. Was is truly participatory?
Yes/No
12. Assume it was carried out according to national policies and laws?
Yes/No
13. Was it carried out transparently?
Yes/No
14. Was there in built accountability? Were things done reasonably on time, within budget and to the satisfaction of the stakeholders?
Yes/No
15. Was the project design gender inclusive?
Yes/No
16. Is the project design appropriate to the needs at every level - national, local, community? At national: yes, no;
at local: yes/no;
at community level: yes/no
17. Can the approach be replicated?
Yes/No.
18. If not, what is needed for replication?
19. Can the approach be scaled up?
Yes/No
20. If not, what is needed for scaling up??
21. What can be improved in the project?
22. To what extent do the project objectives continue to correspond to beneficiaries' needs? Give a percentage
23. Has the project been responsive to changing contexts or needs?
Yes/ No
24. Will the interventions continue after the project is completed?
Yes/No
25. Is there a mechanism for the continuation to be possible?
Yes/No
26. If so, what is it?
27. If not, what is needed?
28. Do you think that because of the EPIC project, changes will be made to policy?
Yes/No
29. What are the actual changes that you see in relation to EbA and Eco-DRR?

For communities

1. How have extreme weather events personally affected you? What happened?
2. Has this project helped to reduce those impacts?
Yes/No
3. How has this project helped you to reduce those impacts?
4. What is the role you played in this project?
5. Was this project successful in your opinion?
Yes/No
6. Rough estimate of how much it was successful. (rough percentage)
7. If so why? What is about the project that was successful?
8. What were the difficulties you faced in implementing this project?
9. What did not work in the project?
10. Why did it not work?
11. What was done through the project was what you and your family needed?
Yes/No
12. How did it benefit you and your family? (Not only in relation to extreme weather events)
13. Did you participate in the project design?
Yes/No
14. Were your ideas included in the project design?
Yes/No
15. Was everything about the project clearly explained to you?
Yes/No
16. If not, what was not clear?
17. Were both men and women equally involved in the project?
Yes/No
18. How many men and how many women?
19. What can be improved in the project?
20. Once the project finishes, will you and your community maintain the bio-engineered sections?
Yes/No
21. How will you maintain it?

For IUCN and partners

1. What is the role you played in this project?
2. Was this project successful in your opinion?
Yes/No
3. Rough estimate of how much it was successful. (rough percentage)
4. If so why? What is about the project that was successful?
5. What were the challenges you faced in implementing this project?
6. What did not work in the project?
7. Why did it not work?
8. Has the project been flexible in adapting in relation to on-the-ground issues?
Yes/No
9. How effective was the approach in delivering what was wanted?
Not effective/effective/Very effective
10. Was the approach truly consensus-oriented?
Yes/No
11. Was is truly participatory?
Yes/No

12. Assume it was carried out according to national policies and laws?
Yes/No
13. Was it carried out transparently?
Yes/No
14. Was there in built accountability? Were things done reasonably on time, within budget and to the satisfaction of the stakeholders?
Yes/No
15. Was the project design inclusive: gender balance there an effort to be inclusive?
Yes/No
16. Is the project design appropriate to the needs at every level - national, local, community?
At national: yes, no;
at local: yes/no;
at community level: yes/no
17. Can the approach be replicated?
Yes/No
18. If not, what is needed for replication?
19. Can the project be scaled up?
Yes/No
20. If not, what is needed for scaling up?
21. What can be improved in the project?
22. To what extent do the project objectives continue to correspond to beneficiaries' needs
Give a percentage
23. Has the project been responsive to changing contexts or needs?
Yes/No
24. Will the interventions continue after the project is completed?
Yes/No
25. Is there a mechanism for the continuation to be possible?
Yes/No
26. If so, what is it?
27. If not, what is needed?
28. Do you think that because of the EPIC project, changes will be made to policy?
Yes/No
29. Are there changes already?
Yes/No add
30. What are the actual changes that you see in relation to EbA and Eco-DRR?
31. Is the project bringing about desired changes in the behaviour of people and institutions? (Is there more effort at planning and incorporation of CEBMR now)
Yes/No
32. Are there any unexpected benefits from this project? For example, are there NGOs interested in following this approach?

For HQ staff

1. What is your designation at IUCN?
2. What is the role you played in this project?
3. Was this overall project successful in your opinion?
Yes/No
4. Rough estimate of how much it was successful. (rough percentage)
5. If so why? What is it about the overall project that was successful?
6. Please provide a breakdown of percentage success
    a) Burkina Faso
    b) Chile

c) China
　　d) Nepal
　　e) Senegal
　　f) Thailand
7. In detail, what was successful in each country
　　a) Burkina Faso
　　b) Chile
　　c) China
　　d) Nepal
　　e) Senegal
　　f) Thailand
8. What were the challenges you faced in implementing this project?
9. What did not work in the overall project?
10. In detail what did not work in each country
　　a) Burkina Faso
　　b) Chile
　　c) China
　　d) Nepal
　　e) Senegal
　　f) Thailand
11. Why did it not work – for each country
　　a) Burkina Faso
　　b) Chile
　　c) China
　　d) Nepal
　　e) Senegal
　　f) Thailand
12. Has the project been flexible in adapting in relation to on-the-ground issues?
Yes/No
13. How effective was the approach in delivering what was wanted?
Not effective/effective/Very effective
14. Was the overall approach truly consensus-oriented?
Yes/No
15. Was is truly participatory?
Yes/No
16. Was it carried out transparently?
Yes/No
17. Was the project design inclusive: gender balance there an effort to be inclusive?
Yes/No
18. Was there in built accountability? Were things done reasonably on time, within budget and to the satisfaction of the stakeholders?
Yes/No
19. Are the activities being implemented in accordance with the overall project plans?
　　Yes/No
20. If not, why?
　　　　a. Burkina Faso
　　　　b. Chile
　　　　c. China
　　　　d. Nepal
　　　　e. Senegal
　　　　f. Thailand
21. Are the funds being spent in accordance with project plans and using the right procedures? Yes/No
22. If not, what happened and where?

23. Have there been any unforeseen problems in terms of resources (technical and financial) allocation and utilization? Yes/No
24. If yes, where and what?
    a. Burkina Faso
    b. Chile
    c. China
    d. Nepal
    e. Senegal
    f. Thailand
25. How well were they dealt with?
26. Is the project design appropriate to the needs at every level - national, local, community?
    At national: yes, no;
    at local: yes/no;
at community level: yes/no
27. Can the approach be replicated?
Yes/No
28. If not, what is needed for replication?
29. Can the project be scaled up?
Yes/No
30. If not, what is needed for scaling up?
31. What can be improved in the project?
32. Has the project been responsive to changing contexts or needs?
Yes/No
33. Do you think that because of the EPIC project, changes will be made to policy?
Yes/No
34. Are there changes already?
Yes/No add
35. What are the actual changes that you see in relation to EbA and Eco-DRR?
36. Is the project bringing about desired changes in the behaviour of people and institutions? (Is there more effort at planning and incorporation of CEBMR now)
Yes/No
37. Are there any unexpected benefits from this project? For example, are there NGOs interested in following this approach?
38. What do you think should be the next phase of EPIC?
39. To what extent is the project contributing to the strategic policies and programmes of IUCN (give a percentage)
    a) EbA objectives are to promote the resilience of livelihoods; has this project done so in Yes/ No and then give a percentage
        I. Burkina Faso
        II. Chile
        III. China
        IV. Nepal
        V. Senegal
        VI. Thailand
    b) EbA objectives are to reduce the impacts of natural disasters such as storms and floods, on vulnerable people and ecosystems; has this project done so in Yes/ No and then give a percentage
        I. Burkina Faso
        II. Chile
        III. China
        IV. Nepal
        V. Senegal
        VI. Thailand

c) EbA objectives are to build the capacity of civil society and government institutions to support integrated approaches to adaptation; has this project done so in Yes/ No and then give a percentage
  I. Burkina Faso
  II. Chile
  III. China
  IV. Nepal
  V. Senegal
  VI. Thailand

d) EbA objectives are to increase awareness of the underlying causes of vulnerability (degraded ecosystems, poor governance, unequal access to resources and services, discrimination and other social injustices); has this project done so in Yes/ No and then give a percentage
  I. Burkina Faso
  II. Chile
  III. China
  IV. Nepal
  V. Senegal
  VI. Thailand

e) EbA objectives are to promote the sustainable management and conservation of biodiversity to maintain the benefits provided by ecosystems (e.g. provision of food and shelter). has this project done so in Yes/ No and then give a percentage
  I. Burkina Faso
  II. Chile
  III. China
  IV. Nepal
  V. Senegal
  VI. Thailand

40. BMU the IKI supports projects that test specific EbA approaches on the ground, analyse the experience gained and disseminate the results. has this project done so in Yes/ No and then give a percentage
  a. Burkina Faso
  b. Chile
  c. China
  d. Nepal
  e. Senegal
  f. Thailand

41. What have been the roles of IUCN HQ management/coordination and the partners?
HQ management
HQ coordination
Partners

42. Were these roles appropriate Yes/No
   HQ management
   HQ coordination
Partners

43. If not, how should it have been different?

44. Is there an effective process for self-monitoring and assessment, reporting and reflection? Yes/No
HQ management
HQ coordination
Partners

45. What was the process?
HQ management
HQ coordination
Partners

46. How could it be made better?

3. Annex 3: List of persons interviewed

BURKINA FASO			
	Persons interviewed	**Designation/Department**	**Interview method**
	IUCN staff		
1	Mme Clarisse Honadia	Programme Manager / IUCN Burkina	By email, questions and answers translated by IUCN
2	Moumini	Head of Programme / IUCN Burkina	By Skype
3	Oumarou Seynou	Project officer/IUCN Burkina	By email, questions and answers translated by IUCN
4	Zabre Sylvain	Project Coordinator, EPIC	In person, in Senegal, questions and answers translated by IUCN
5	Camille Buyck	Programme Officer, IUCN HQ	By email
6	Radhika Murti	Senior Programme Coordinator, DRR	In person, in Senegal
7	Jean-Marc Garreau	Regional Coordinator, Central and West Africa Regional Office	By Skype
	National stakeholders		
8	Prof. B. André BATIONO	Environment and Agricultural Research Institute (INERA)	By email, questions and answers translated by IUCN
9	Oussimane Ouédraogo	Conseil National de Secours d'Urgences et de Réhabilitation (CONASUR)	By email, questions and answers translated by IUCN
	Local stakeholders		
10	Saïdou COULIBALY	Ancien Haut-Commissaire de la province du Yatenga	By email, questions and answers translated by IUCN
12	T. Justin Tiemtoré	Coordinator / APROS	By email, questions and answers translated by IUCN
13	Hamado Yonaba	Service Environnement/Titao	By email, questions and answers translated by IUCN
15	H. Pascal Ouoba	Service Environnement/Koumbri	By email, questions and answers translated by IUCN
16	Ibié Néya	Service Environnement/Namissiguima	By email, questions and answers translated by IUCN
17	Marcellin Compaoré	Service Agriculture/Barga	By email, questions and answers translated by IUCN
18	Ardjouma Tou	Service Elévage/Namissiguima	By email, questions and answers translated by IUCN
19	Malick Ouédraogo	Service Elévage/Titao	By email, questions and answers translated by IUCN
	Communities		
20	Tougou Village focus group (7 men ; 4 women)	Village committee of Tougou	In person, by EPIC project coordinator questions and answers translated by IUCN
21	Chief of Tougou Village	Tougou Village	In person, by EPIC project coordinator questions and answers translated by IUCN
22	Ramdolla Village focus group (6 men; 4 women)	Village committee of Ramdolla	In person, by EPIC project coordinator questions and answers translated by IUCN
23	Chief of Ramdolla Village	Ramdolla Village	In person, by EPIC project coordinator questions and answers translated by IUCN
24	Tibtenga Village focus	Village committee of Tibtenga	In person, by EPIC project

			coordinator questions and answers translated by IUCN
25	Chief of Tibtenga Village	Tibtenga Village	In person, by EPIC project coordinator questions and answers translated by IUCN
26	Birdininga Village focus group (7 men ; 5 women)	Village committee of Tibtenga	In person, by EPIC project coordinator questions and answers translated by IUCN
27	Chief of Birdininga Village	Birdininga Village	In person, by EPIC project coordinator questions and answers translated by IUCN
28	Sillia Village focus group (5 men ; 5 women)	Village committee of Sillia (x people)	In person, by EPIC project coordinator questions and answers translated by IUCN
29	Chief of Silla Village	Silla Silla	In person, by EPIC project coordinator questions and answers translated by IUCN
30	Basnéré Villagefocus group (6 men, 5 women)	Village committee of Basnéré	In person, by EPIC project coordinator questions and answers translated by IUCN
31	Chief of village, Basnéré	Chief of Basnéré Village	In person, by EPIC project coordinator questions and answers translated by IUCN
	CHILE		
	Persons interviewed	**Designation/Department**	**Interview method**
	IUCN Staff and consultants		
1	Doris Cordero	Chiar of CEM for South America, former coordinator for EPIC	By Skype
2	Karen Podvin	Coordinator, EPIC project IUCN Regional Office for South America (IUCN-Sur)	By Skype
3	Erika Cortes-Donoso	Consultant to IUCN Focal point for EPIC Chile	By Skype
4	Radhika Murti	Senior Programme Coordinator, DRR	By Skype
5	Camille Buyck	HQ IUCN	By email
	Implementing partner SLF		
6	Alejandro Casteller	Implementing partner, SLF	By Skype
7	Peter Bebi	Implementing partner, SLF	By Skype
	Government officers		
8	Daniel Alvarez	Professional of the Division of Renewable Natural Resources and Biodiversity of the Ministry of Environment (MMA)	By email, questions and answers translated by IUCN
9	Maria .Cecilia Jiménez	Regional Ministerial Secretariat of the Biobío Region (SEREMI Biobío)	By email, questions and answers translated by IUCN
10	Pablo San Martín from the	Regional Government of San Martín.	By email, questions and answers translated by IUCN
	CHINA		
	Persons interviewed	**Designation/Department**	**Interview method**
	IUCN staff		
1	Dr Zhu Chunquan	Country Representative IUCN China	By Skype
2	Ms. Jing Liu	IUCN China,P officer	By Skype
3	Mr. Yan Zhang	IUCN China Programme	By Skype

		Coordinator	
4	Mr. Anshuman Saikia	Project Coordinator, IUCN Asia Member of steering committee	By email
5	Ms. Radhikla Murti	Senior Programme Coordinator, DRR	By Skype
6	Ms. Camille Buyck	HQ IUCN	By email
	INRA implementing partner		
7	Dr Alexia Stokes	INRA Implementing partner	By Skype
8	Dr Mao Zhung	INRA Implementing partner	By Skype
9	Jerôme Nespoulous	INRA PhD student	By email
10	Michiel Voermans	INRA BSc Intern	By email
11	Dr. Roy Sidle	Professor of Geography, University of the Sunshine Coast Sippy Downs, Queensland Secondary Adviser to PhD student , INRA	By email
	Government officers		
12	Ms Wu Yusong	Yunnan Forestry Department, YFD	By email, questions and answers translated by IUCN
13	Prof Yu Xinxiao	China Water and Soil Conservation Association	By email, questions and answers translated by IUCN
14	Ms. Chen Xia	National Disaster Reduction Center	By email, questions and answers translated by IUCN
15	Ms GUAN Xiuling,	China Forestry Society	By email, questions and answers translated by IUCN
NEPAL			
	Persons interviewed	**Designation**	**Interview method**
	Government officers		
1	Dr Prahlad Thapa	Country Representative, IUCN Nepal	In person, at workshop when there was time
2	Ms Anu Adhikari	Project Manager, IUCN	In person, at workshop when there was time
3	Ms Camille Buyck	Programme Officer, EPIC Global	In person, at workshop when there was time and by email
4	Mr Anshuman Saika	Programme Coordinator, Asia Regional Office	By email
UNIL – implementing partner			
5	Dr Karen Sudmeier-Rieux	UNIL, implementing partner.	In person, in the field
6	Mr Sanjay Devkota,	PhD student/Consultant engineer for UNIL	In person, in the field
National level government officers			
7	Dr Prem Kandel	Joint Secretary, Ministry of Forestry and Soil Conservation	In person, at workshop when there was time
8	Mr Bijay Raj Poudel	Director General, Dept. of Soil Conservation and Watershed Management (DSCWM)	In person, at workshop when there was time
9	Mr Driendra	Under Secretary, DSCWM	In person, at workshop when there was time but discarded, incomplete

District level government officers			
10	Damber Basadur Thapa	District Soil Conservation Officer, Kaski	In person, at workshop when there was time
11	Raj Gupta	District Soil Conservation Officer Syangja	In person, at workshop when there was time
12	Mr Prakash Vasnet DSCO	District Soil Conservation Officer, Prabhat	In person, at workshop when there was time
13	Mr Kamal Prasad Gautam	District Soil Conservation Officer, Syangja	In person, at workshop when there was time
University Personnel			
14	Dr Basantha Raj Adhikari	DD Centre for Disaster Studies, Tribhuvan University/Associate Professor of Engineering Geology	In person, at workshop when there was time
15	Prof. Krishna Raj Tiwari	Dean, Institute of Forestry, Tribhuvan University	By email
Community leaders			
16	Mr Khem Bahadur	GC, community leader, Tilar, Prabhat	In person, at workshop when there was time
17.	Mr Suanne Panni Pakha Sammracherja	Community leader, Bhatkhola, Syangja	In person, at workshop when there was time
18.	Hari Parsat Koirala	Community leader, Gharelu	In person, in the field
19	Mrs Radhika Poudel	Chairperson, Mothers' Group, Bhatkhola, Syangja (Discarded, incomplete)	In person, at workshop when there was time
INGO			
20	Dr Judy Oglethorpe	WWF	By email
	SENEGAL		
	Persons interviewed	**Designation**	**Interview method**
IUCN STAFF			
1	Mr. El Hadji Ballé SEYE	National facilitator EPIC	In person in the field, in Senegal
2	Mr.Racine KANE	Chief of Programme, UICN-Sénégal	In person, in Senegal
3	Youssouph DIEDHIOU/	World Heritage Program Officer	In person, in Senegal
4	Radhika Murti	Senior Programme Coordinator, DRR	In person, in the field, in Senegal
5	Camille Buyck	Programme Officer, EPIC	By email
6	Fabiola Monty		By email
7	Jean-Marc Garreau	Regional Coordinator, Central and West Africa Regional Office	By Skype
NATIONAL STAKEHOLDERS			
8	Hon Abdou Sane	President of the African Association for the Promotion of Disaster Risk Reduction	In person
9	Commander Abdou Salam KANE	Department of National Parks, focal point of Ramsar Convention	In person
10	Dr Henri Lo,	Lecturer at ISE	In person
11	Dr Goudiaby	Lecturer at ISE	In person
12	Abdallah CAMARA	Chief of the Department of Sustainable Development	In person
LOCAL STAKEHOLDERS			
13	Mr Masdo Samb	Regional Director, Meteorological services	In person
14	Serigne Abdou Ndar Fall	Secretary General of the County Council of Foundiougne	By email and clarification by phone

15	His Excellency Lansana Sano	Mayor of Djilor	In person in the field
Communities			
16	Focus group meeting (25 people), including village committee president	Gagué Chérif	In person in the field
17	Focus group meeting (23 people), including village committee president	Djilor	In person in the field
18	Village Chief	Péthie	In person in the field
19	Focus group meeting (25 people)	Péthie	In person in the field
20	Village Chief	GoudèmeSidy	In person in the field
17	Focus group meeting (42 people)	GoudèmeSidy	In person in the field
18	Focus group meeting (11 people)	Sadioga	In person in the field
18	Focus group meeting (35 people)	Kamatane Bambara	In person in the field
	THAILAND		
	Persons interviewed	**Designation**	**How the interview was carried out**
IUCN STAFF:			
1	Ms. Supranee.Kampongsun	Project Coordinator for EPIC	In person in Krabi
2	Petch Manopawitr	Deputy, Southeast Asia Group	In person in Bangkok
3	Dr Chamniern Vorratnchaiphan,	Country Representative, IUCN Thailand	In person in Bangkok
4	Ms. Camille Buyck	Programme Officer, EPIC Global	By email
5	Ms. Radhikla Murti	Senior Programme Coordinator, DRR	By Skype
6	Mr. Anshuman Saikia	Project Coordinator, IUCN Asia Member of steering committee	By email
MAP Implementing partner			
7	Mr Jim Enright	MAP implementing partner	In person in Krabi
8	Jaruwan Kaewmahanin (Ning Enright)	Field Project Manager MAP Thailand,	In person in Krabi
ADVISORY COMMITTEE MEMBERS			
9	Mr. Donnapat Tamornsuwan	Senior Field Officer, Raks Thai Foundation (member of advisory committee)	In person in Koh Klang
10	Ms Somsri Piwdee	Community representative for her village on the Sub District Administration	In person in Koh Klang
11	Ms Chitra Jiraporn Yingtoondee	Administrative office of the SAO	In person in Koh Klang
12	Mr. Chaisak Sweangphol	Director, Provincial Disaster Prevention and Mitigation Organization, Member Advisory Committee	In person in Krabi
13	Mr Rungruang Sunahu	Management Unit # 26 DMCR (local)	In person in Krabi
14	Mr. Sompoch Nimsantijaroen	Consultant Aquaculture Expert (advisory committee member)	By telephone in Krabi

	Community members		
15	Mr Banyat Stan	Village chief, Village # 3	In person, in the field
16	Mr Bao Sampont Klontrua ,	EMR assistant, owner of homestay on Kok Kalang island,	In person, in the field
17,18,19	Khun Nit Sookdant, Panada Podkerd, and Malinee Panuat	Women's group Site #2	In person, in the field
20	Mr Sanie Klongrua, Imam	owner of Site #2 Advisory committee member	In person, in the field
21	Mr Anon Meelam	owner of Site #1 Advisory committee member	In person, in the field
22	Juree Deeboot, Jira Khunpak, Wipaphon Khonklant, Sunida Khonklat, Chitthima Khonklayt, Watchara Chomgrak	Women's group Site #1	
	NGO		
23	Ms. Montira A. Reijner,	Project Abroad -	In person in Krabi

EPIC GLOBAL STAFF

	Persons interviewed	Designation	How the interview was carried out
1	Mr. Edmund Barrow	Head, Global Ecosystem Management Programme	By Skype
2	Ms. Radhikla Murti	Senior Programme Coordinator, DRR	By Skype
3	Ms. Camille Buyck	Programme Officer, EPIC Global	By email
4	Ms Fabiola Monty	Junior Scientist, technical and communication support	By Skype
5	Ms. Maria Hasler	Programme Finance Officer Member of steering committee	By Skype
6	Mr. Ali Raza Rizvi	Programme Manager, Ecosystem-based Adaptation	By Skype
Donor			
7	Mr Tilman Hertz	Programme Officer, Climate Change BMU	By Skype

Details of persons interviewed in the target villages in Burkina Faso

Name	
Basnéré	
1	ZONGO Zoénabou
2	OUEDRAOGO Bintou
3	SAVADOGO Sanata
4	SAVADOGO Zoénabou
5	BAGAYA Bibata
6	OUEDRAOGO Salifou
7	OUEDRAOGO Madi
8	OUEDRAOGO Isso
9	OUEDRAOGO Salam
10	OUEDRAOGO Idrissa
11	OUEDRAOGO Rasmané

Birdinga	
12	TALL Nouhoun
13	TALL Oumarou
14	TALL Amadou
15	TALL Oumarou
16	TALL Sambo
17	TALL Amadou
18	TALL Adou
19	TALL Mariama
20	TALL Fatoumata
21	TALL Adama
22	TALL Hassanatou
23	TALL Fatoumata
Ramdolla	
24	OUEDRAOGO Isso
25	BADINI Iliassa
26	OUEDRAOGO Inoussa
27	GEMBRE Binta
28	OUEDRAOGO Aïssa
29	KAGONE Mariam
30	KAGONE Bata
31	GUIRO Boukary
32	OUEDRAOGO Soumaïla
33	GUIRO Isso
Sillia	
34	GAMSORE Rasmané
35	KOMI Fati
36	KOMI Haoua
37	BOUDA Mariam
38	OUEDRAOGO Guénéba
39	TRAORE Rabbi
40	KONFE Hamidou
41	BOUDA Hamadé
42	GAMSONRE Hamidou
43	GAMSONRE Ousséni
Tibtenga	
44	OUEDRAOGO Awa
45	PORGO Ramata
46	BELEM Mamadou
47	BELEM Issa
48	PORGO Habibou
49	PORGO Mariam
50	NACANABO Limata
51	BELEM Ousseini
52	BELEM Issouf
53	ROMBA Harouna
Tougou	
54	SAVADOGO Pacodé
55	SAVADOGO Moustapha
56	SAVADOGO Pousbila
57	SAVADOGO Malik
58	OUEDRAOGO Adama
59	OUEDRAOGO N. Adama
60	ZOROM Mahamadi
61	NABASSAGA Sanata
62	OUEDRAOGO Zoenabo
63	OUEDRAOGO Ramata
64	OUEDRAOGO Kalizèta

Details of persons interviewed in the target villages in Senegal not recd

4. Annex 4: List of documents reviewed

Burkina Faso
Annual report (2014). *EPIC Annual Report 2014 for Burkina Faso.* Unpublished Report. 10 pp. Sent by EPIC Global Programme Manager.
Annual report (2015). *EPIC Annual Report 2015 for Burkina Faso.* Unpublished Report. 10 pp. Sent by EPIC Global Programme Manager.
Annual report (2016). *EPIC Annual Report 2016 for Burkina Faso.* Unpublished Report. 10 pp. Sent by EPIC Global Programme Manager.
APROS (2016). Evaluation report on the impact of development on beneficiaries in the six (6) villages of the EPIC project sites in the provinces of Yatenga and Loroum / Region North / Burkina Faso.
Arrete N°2014-/MATS/RNRD/GVR-OHG/SG (2014). Constitution of the Regional Committee
EPIC (2016). Trip Report Senegal- 19th to 25th April 2016. Unpublished Report. 12 pp. Sent by EPIC Global Programme Officer
Green Cross (2016). Production Training Manual for Compost Plus. Unpublished Report. 49 pp. Sent by Project Manager, Burkina Faso
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5.   Annex 5: Global Outcomes and Outputs

Outcome

	Predicted outcome	Indicator	Realised	Indicator	Realised	Indicator	Realised
Outcome	Ecosystem services are recognised, promoted and conserved as an integral part of disaster risk reduction policy, planning and pro-gramming in the 6 target countries and in key global processes such as implementation of The Hyogo Framework of Action of UNISDR, and climate change adaption framework of the UNFCCC.	At least 4 target countries allocate, from national or ODA sources, (or apply for ODA resources) to promote and implement ecosystem based DRR by the end of the project.	EPIC Phase II projects already submitted to the GCF for Senegal; Chile is in the early stages of preparing the proposal. The signing of the MoU between the DMCR and IUCN is an exceptional opportunity to push Eco-DRR into the national policy arena.	The UNISDR Global Platforms 2013 and 2015 include at least 3 advocacy events on ecosystem services for DRR based on the re-sults of this project, that strengthen UN ISDR's commitment to ecosystems services for DRR.	For 2013 EPIC China was showcased during an event on 'Heritage and Resilience'; At the Franco-phone Platform side meetings with ministry representatives and IUCN staff were held (IUCN, 2013a) For 2015 World Con-ference on DRR (WCDRR): launch of publication titled 'Protected Areas as Tools for Disaster Risk Reduction – A handbook for practitioner', including EPIC case studies. Also at a Ministerial Roundtable on Intern Ministerial Roundtable on Interna-tional Co-operation (IUCN, 2015b)	The Climate Change Adaptation Framework of UNFCCC recognizes the importance of ecosystem based DRR as a core component of global and nation-al adaptation implementation frameworks.	The Paris Agreement (UNFCCC, 2015) has several references to ecosystems, including 'a contribution to the long-term global response to climate change to protect people, livelihoods and ecosystems'

Output 1

	Predicted outcome	Indicator	Realised	Indicator	Realised	Indicator	Realised	Indicator	Realised	Indicator	Realised	Indicator	Realised
Output 1	One common research and learning framework developed, and five case studies covering the target countries established and implemented	A common research and learning framework established at the inception workshop and available to all implementing partners by December 2012.	Achieved. (Work plan, Annual Reports in Dropbox) (100%)	Calibrated/validated avalanche models and documentation of forest-avalanche interactions in target landscapes in Chile available within 5 years.	Completed in Chile. (Casteller et al., 2016) (50%)	At least 75% restoration of mangroves on abandoned shrimp farms in the Thailand landscapes within 5 years	Not fully realised as regeneration has been slower than expected. However, monitoring, through another project, will continue till 2020.	Ten native plant species play a key role in stabilising slopes identified, and relevant planting mixtures of these species established using numerical modelling for the slope's Factor of Safety (FOS) in the target hillside landscapes (China) within five years.	Ten species tested for architectural physiological and mechanical traits. These species included two exotics, *Agave americana* and *Jatropha curcas*, used by the Chinese government in slope stabilisation. The use of a mixture of species was suggested, as well as specific species at different levels of the slope. Not implemented though, only a scientific study (Ghestem et al.,	Three pilot project areas established in Nepal that use locally adapted bio-engineering landslide stabilization techniques as the basis for building capacity of key local stakeholders for reducing landslide risk over the next five years.	Achieved (Annual report 2016). Two of the three sites are more successful that the third (Work plan 2017) (90%)	Economic benefits of integrated ecosystem-based adaptation strategies, risks and effects of climate change on poor people and on poverty alleviation efforts are documented (and used in Output 2) in target communities of Burkina Faso and Senegal.	Not achieved. A cost-benefit analysis carried out only for Nepal (IUCN and UNIL, 2016)

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| | | | | | 2015).(50%) | | | | |

Output 2

	Predicted outcome	Indicator	Realised	Indicator	Realised
Output 2	Tailored policy messages for six countries and two international organizations, and one capacity building package developed	Reference to the role of "well managed ecosystems in delivering disaster risk reduction benefits" compatible with IUCN's guidance informs and reflected in, at least, draft legal and policy frameworks of at least 4 countries and in the draft policy agreements of two international organizations within five years.	In Chile, multiple entries into policy have achieved through EPIC. In Nepal, the eco-DRR concept has been integrated into the new National Strategic Framework for Nature Conservation (NSFNC) and t the National Watershed Management Policy Act has been drafted based on the EPIC pilot; and in Thailand, IUCN has signed an MoU with the DMCR allowing for future collaboration on CBEMR (See Chapter on Lessons Learned for details of all of the above	Localised PEDRR training conducted in 6 countries	PEDRR sessions were included into the inception workshops of Chile, Nepal and Thailand.In China an initial workshop was also held. In Burkina Faso and Senegal dedicated PEDRR trainings were organised in 2014/2015 and conducted by the project coordinators, with support from the EPIC Global staff. (Correspondence with project coordinators and annual reports).

Output 3

	Predicted outcome	Indicator	Realised	Indicator	Realised
Output 3	Six multi-stakeholder dialogue (MSD) platforms, comprised of government, NGOs, civil society established in target countries that use and promote nationally, and provide input into the findings of the project	Six MSD platforms active within one year of the project.	MSD platforms have been established, but in tandem with policy influence, therefore, for example, lacks private sector representations	MSDs used as one means to inform and influence policy (Output 2) through direct engagement with, and review of briefs.	Successful at the local level in Burikina Faso; nationally very successful in Chile, Nepal and Thailand. The other countries are on their way.

6. Annex 6:Status of Country-wise Outcomes and Outputs

Output 1	Realised output
Overall: One common research and learning framework developed, and five case studies covering the target countries established and implemented.	Completed, but success rate of case studies varies.
Burkina Faso The risks and / or effects of climate change on the poor, on poverty reduction efforts are assessed and documented for the benefit of local rural development decision-makers, water resources and the environment	Achieved reasonably well. (See Annexe 5).
Chile No specific objectives	See also under Global outputs Achieved: Calibrated/ validated avalanche model and documentation of forest-avalanche interactions available. (See Annex 6)
China Output 1. Effects of climate change and associated strategies assessed and documented	Achieved. Landslide risk assessed in the Yunnan Province (IUCN, ProAct and INRA, 2013) (See Annex 7
Nepal Three pilot project areas established in Nepal that use locally adapted bio-engineering landslide stabilisation techniques as the basis for building capacity of key local stakeholders for reducing landslide risk over the next 5 years.	Achieved well (See Annexe 8)
Senegal No specific objectives	Achieved (See Annex 9)
Thailand Effects of climate change and associated strategies assessed and documented	Achieved (See Annex 10)

Output 2	Realised output
Overall: Tailored policy messages for seven countries and two international organisations and one capacity building package developed	Policy message achieved for Chile (Annex 6), Nepal (Annex 8), Senegal (Annex 9) and Thailand (Annex 10).
Burkina Faso The economic benefits of integrated ecosystem-based adaptation strategies to reduce the vulnerability of poor rural communities are demonstrated	Not achieved.
Chile No specific objectives	For Chile, entries into multiple policies have been achieved (Annex 6).
China Best strategies are demonstrated	IUCN China has built a relationship with the National Centre for DRR; in terms of the policy message, progress has been slow, as INRA's research findings have to be incorporated and specific recommendations on slope restoration be made. A policy brief is currently under development to this end.
Nepal Best strategies are demonstrated at local and national level – 'eco-safe roads, Nepal'	Achieved (Annex 10)
Senegal No specific objectives	Achieved. EPIC has been instrumental in catalysing the formulation of a departmental level disaster risk reduction committee and action plan through EPIC's steering committee, the first of its kind in Senegal, and EbA has been included in the National Wetland Policy. (Annex 9)
Thailand Best strategies are demonstrated	On the ground regeneration has been slow, but engagement with communities has been good. However, a 5-year MoU with the DMCR and

	input in to the Marine and Coastal act has strengthened IUCN's position of policy influence (Annex 10).
Output 3	**Realised output**
Overall: .Six multi-stakeholder dialogue platforms, comprised of government, NGOs, civil society established in target countries that use and promote nationally and provide input to the findings of the project.	MSD platforms have been established, but in tandem with policy influence, therefore, for example, lacks private sector representations
Burkina Faso No specific objective	Achieved. See organigram below.
Chile No specific objectives	Achieved. See organigram below.
China Stakeholders are trained on ecosystem-based approaches to DRR and CCA – on slope stabilisation for landslide prevention	Achieved. See organigram below.
Nepal Stakeholders are trained on ecosystem-based approaches to DRR and CCA – best bio-engineering practices for eco-safe roads	Achieved. See organigram below.
Senegal No specific objectives	Achieved. See organigram below.
Thailand Stakeholders are trained on ecosystem-based approaches to DRR CCA – community-based environmental mangrove restoration	Achieved. See organigram below.
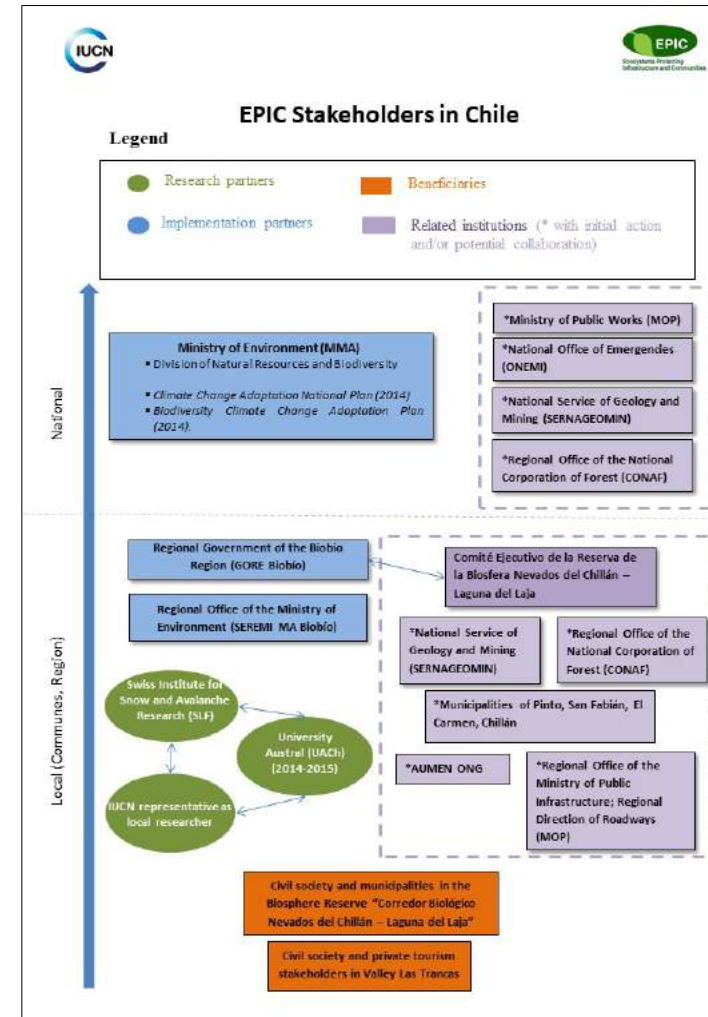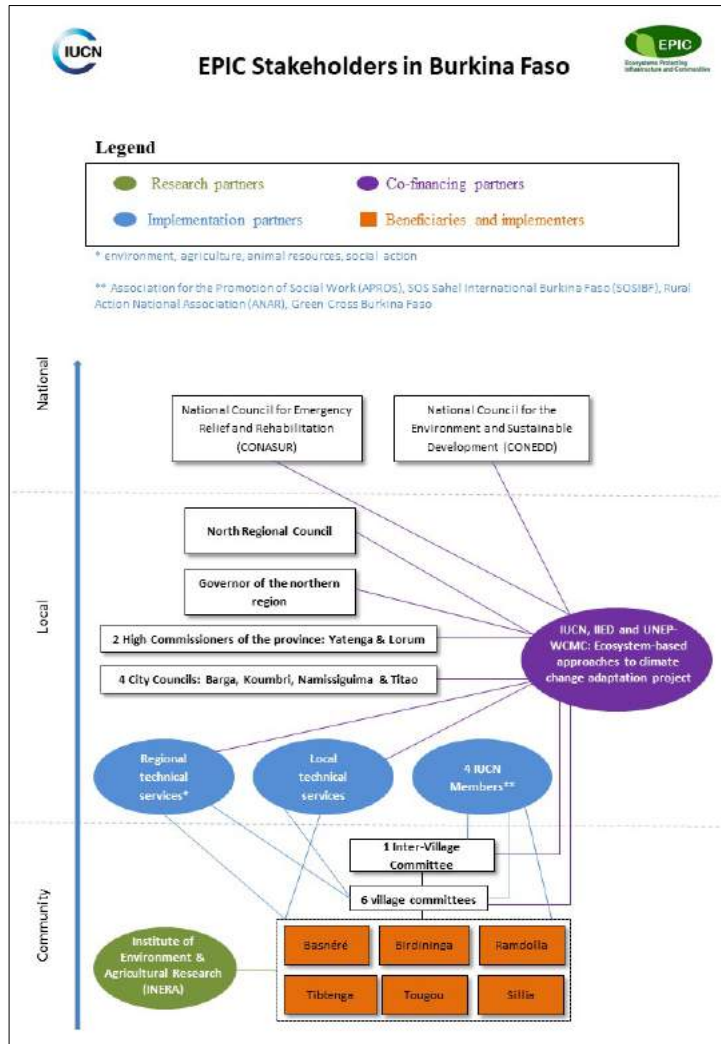
Figure 21.Multi-stakeholder Organigrammes for Burkina Faso (left) and Chile (right
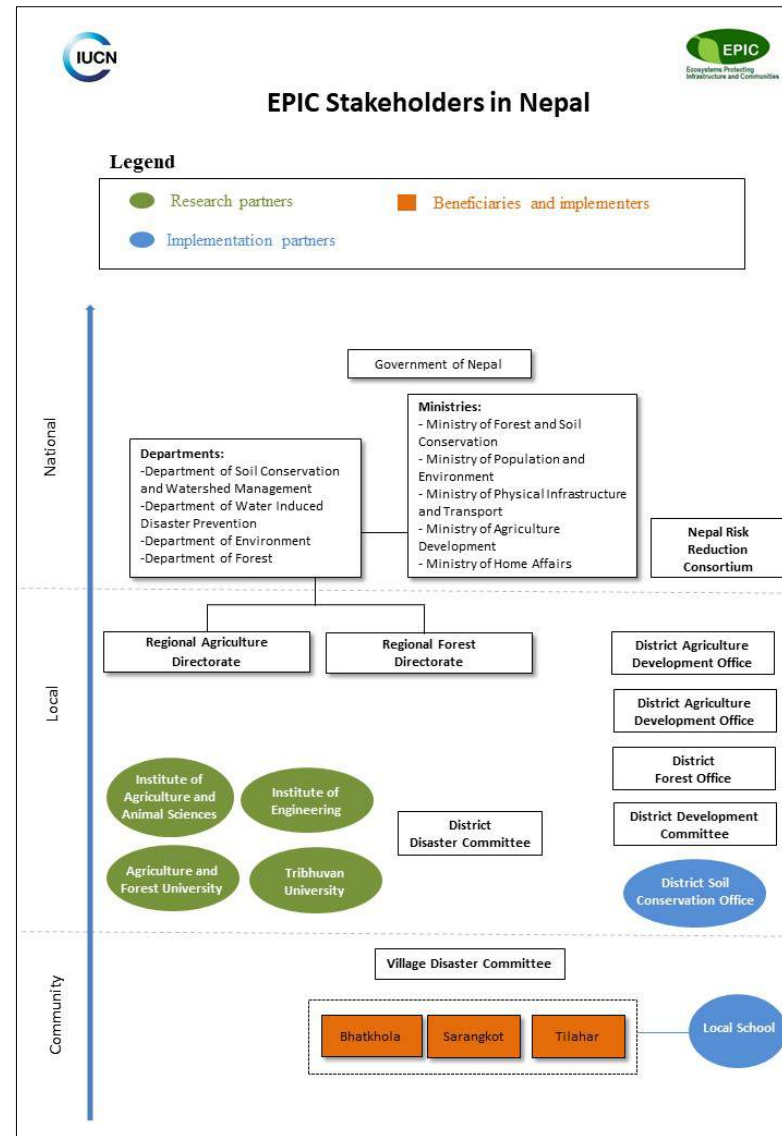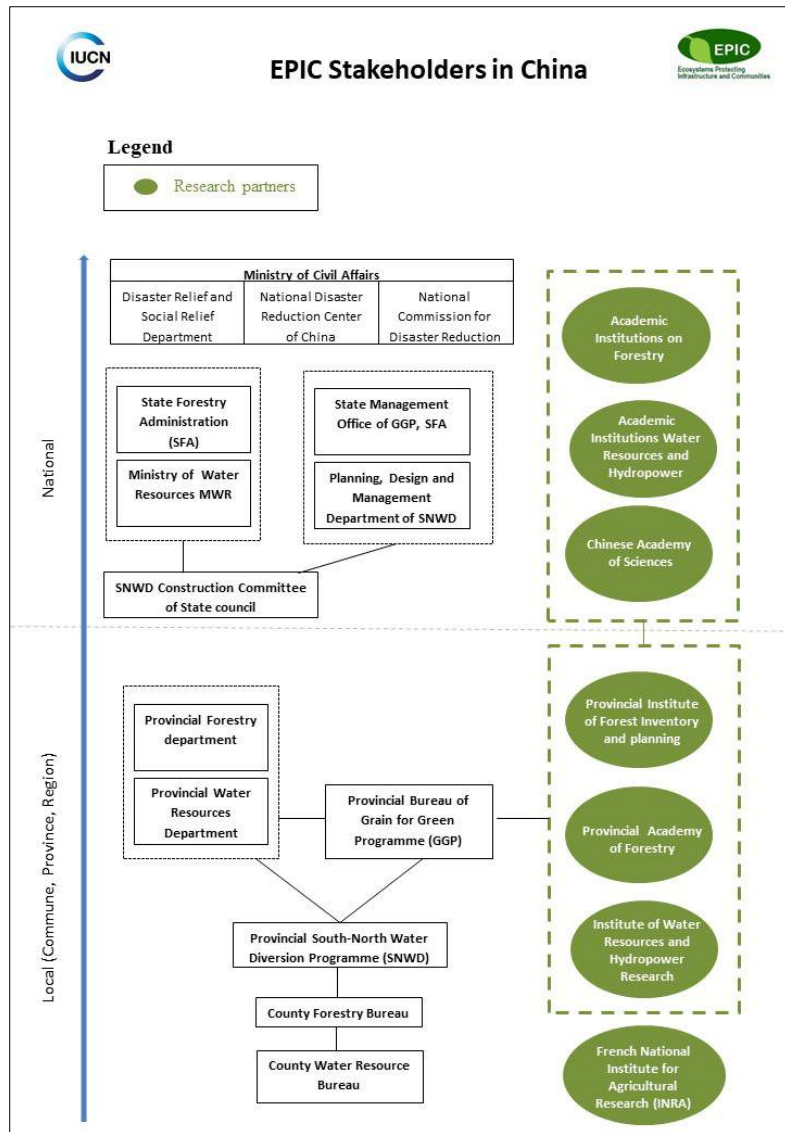
Figure 22.Multi-stakeholder Organigrammes for China (left) and Nepal (right
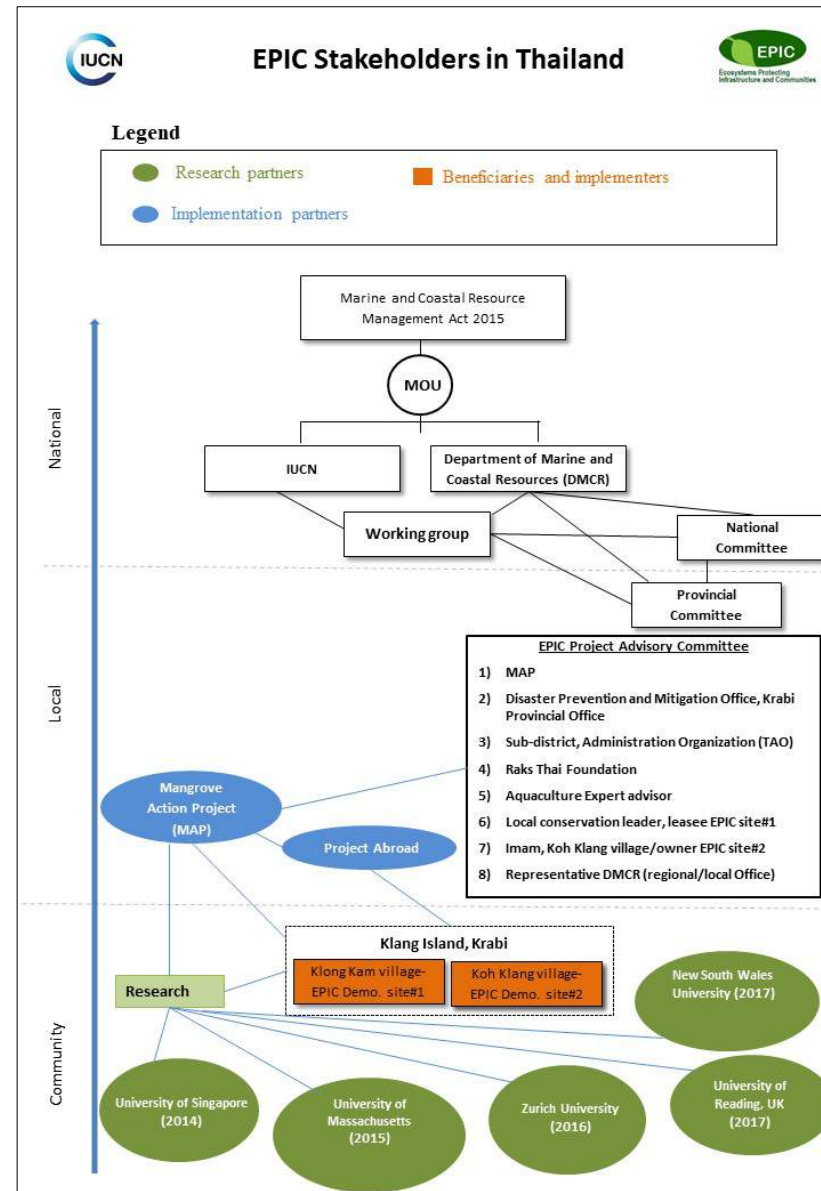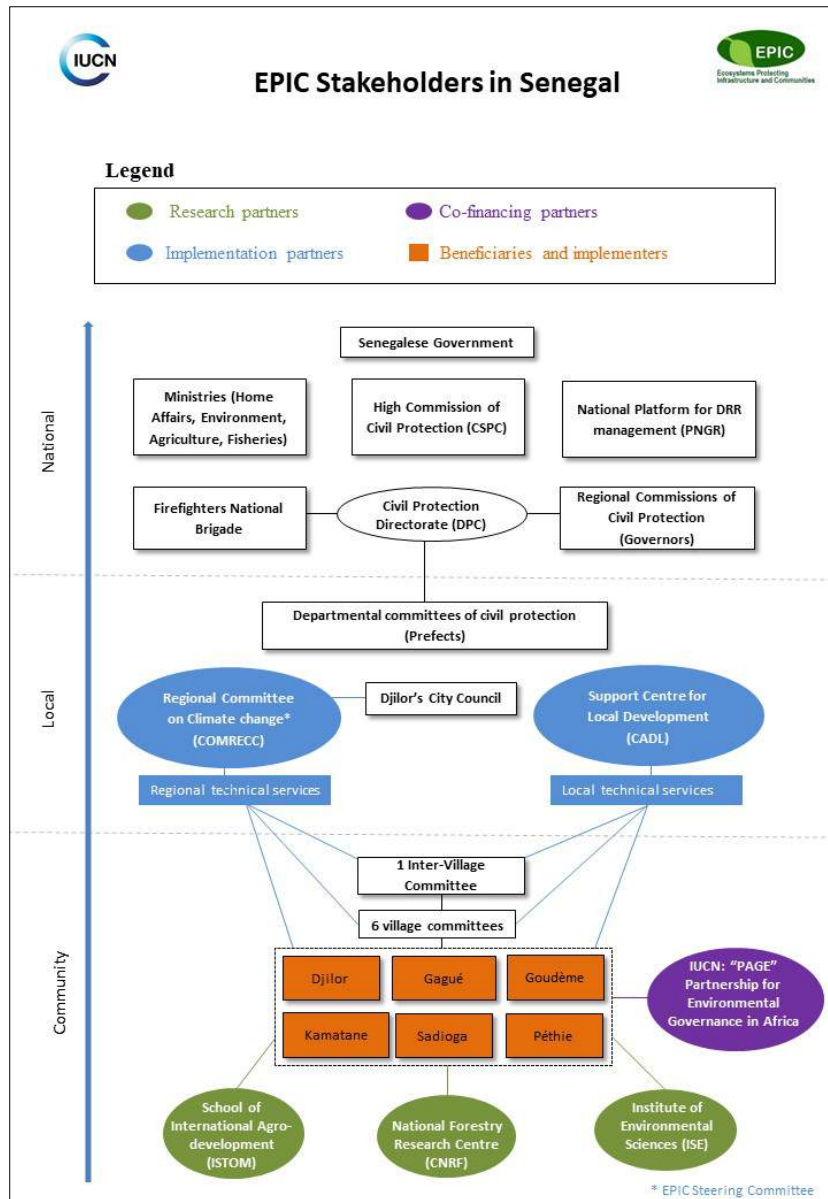
Figure 23.Multi-stakeholder Organigrammes for Senegal (left) and Thailand (right)

7. Annex 7: Logical framework for EPIC Burkina Faso

Goal	Objectives	Sites	Activities	Results	Reach	Impact	Predicted outcomes	Realised outcomes	Means of assessment
		Six villages in the Yatenga and Lorum provinces. 1. Basnéré 2. Birdininga 3. Ramdolla 4. Sillia 5. Tibtenga 6. Tougou	Develop a note on the selection criteria of the region and villages	Completed, criteria for selection: level of vulnerability to climate change; the level of food insecurity; and poverty level.			.		IUCN, 2013a, 2013b, in Drop box
	1. To document and assess the risks and/or effects of climate change on poor people, on poverty to the benefit of local decision makers of the rural development, water resources and environment sectors	All villages	Conduct a socio-economic baseline study and livelihoods in six villages	Completed. The total population of the six village study sites in 2013 was 10,182			1. Effects of climate change and associated strategies assessed and documented	Achieved	IUCN, 2013a, in Drop box
		All villages	Evaluate the impact of recent extreme climate events on the environment and on local poverty reduction strategies and the responses of local populations and institutions	Report completed					Hien, 2015, sent by project coordinator
			A vulnerability and capacity assessment workshop was held from 8-12 July 2013 in Ouahigouya. To, a) sensitise the actors on present and future climatic and non-climatic risks; b) increase	Innovations identified by communities 1. Basnéré:. Soil restoration and reforestation; 2. Birdininga: soil restoration and	Attended by 29 community members; 5 officers of the local government; 3 officers from local technical services; 10 representatives				IUCN, 2013c, sent by project coordinator

Goal	Objectives	Sites	Activities	Results	Reach	Impact	Predicted outcomes	Realised outcomes	Means of assessment
			awareness on local innovations related to production, as well as to institutional, cultural and economic aspects; c) facilitate new areas of co-operation that allow for a critical review of the operating modes as well as the contributions of each actor groups for climate change adaptation. The workshop applied the Promoting Local Innovations (PLI) toolkit designed by the CDE and used elements of the Climate Resilience Evaluation for Adaptation through Empowerment (CREATE) methodology to analyse risks and determine local capacities or 'innovations.	sustainable management of water bodies; 3. Ramdolla: feed crops and soil restoration through Zai 4. Sillia: soil restoration and bank protection of the dam of Sillia; 5. Tibtenga: soil restoration and reforestation	of local NGOs; and one person conducting research at a national level.				
		All villages	Innovations were summarised into 1. Soil restoration through indigenous techniques (Zaï and stone bunds) and 2. Replanting for increasing the vegetation cover and restoring riverbanks (against silting			Impact has not been scientifically monitored, but it is understood that general awareness has increased. Even the monitoring by APROS restricts itself to reporting on how the	2. Best strategies are demonstrated	Best strategies have been demonstrated	Annual report 2016, APROS 2016

Goal	Objectives	Sites	Activities	Results	Reach	Impact	Predicted outcomes	Realised outcomes	Means of assessment
				from erosion).		activities were conducted, not the impacts of those activities.			
		Basnéré	Zai	30 ha	The whole community (460 people)				
			Stone bunds	20 ha	The whole community (460 people)				
			Nursery	1,640 plants produced and planted in home gardens and fields	The whole community (460 people)				
			ANR	30 ha	Directly, the households of the practitioners= 360, indirectly, the whole community=460				
			Manure pits	10 established in home gardens	180 person				
			Biodigesters	1 established in a concession13	10 persons.				
		Birdininga	Zai	2 ha	The whole community (92 people)				
			Stone bunds	10 ha	The whole community (92 people)				
			ANR	4 ha	Directly, the households of the practitioners= 32, indirectly, the whole community=92				
			Biodigesters	1 established in a concession	17 persons				
		Ramdolla	Zai	240 ha	The whole community (2,006 people)				
			Stone bunds	60 ha	The whole community (2,006 people)				

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13 A concession is a piece of land, usually closed, where several houses (inhabited by members of a family) are settled around a courtyard.

Goal	Objectives	Sites	Activities	Results	Reach	Impact	Predicted outcomes	Realised outcomes	Means of assessment
			Nursery	2,575 plants produced and planted in home gardens and fields	The whole community (2,006 people)				
			ANR	60 ha	Directly, the households of the practitioners= 840, indirectly, the whole community=2,00 6				
			Manure pits	11 established in home gardens	231 persons				
			Biodigesters	2 established in households	42 persons				
		Sillia	Zai	530 ha	The whole community (1,820 people)				
			Stone bunds	55 ha	The whole community (1,820 people)				
			Gabions	90 m^3	The whole community (1,820 people)				
			Nursery	790 plants produced and planted in home gardens and fields	The whole community (1,820 people)				
			ANR	20 ha	Directly, the households of the practitioners= 750, indirectly, the whole community=1,82 0				
			Manure pits	5 established in home gardens	125 persons				
			Biodigesters	6 established in a concession	150 persons				
		Tibtenga	Zai	30 ha	The whole community (366 people)				
			Stone bunds	20 ha	The whole community (366 people)				
			Nursery	2,500 plants	The whole				

Goal	Objectives	Sites	Activities	Results	Reach	Impact	Predicted outcomes	Realised outcomes	Means of assessment
				produced and planted in home gardens and fields	community (366 people)				
			ANR	50 ha	Directly, the households of the practitioners= 200, indirectly, the whole community=366				
			Manure pits	5 established in home gardens	100 people				
			Biodigesters	2 established in a concession	40 people				
		Tougou	Zai	240 ha	The whole community (5,437 people)				
			Stone bunds	200 ha	The whole community (5,437 people)				
			Gabions	80 m^2	The whole community (5,437 people)				
			Nursery	5100 plants produced and planted in home gardens and fields	The whole community (5,437 people)				
			ANR	100 ha	Directly, the households of the practitioners= 850, indirectly, the whole community=5,437				
			Manure pits	20	400 people				
			Biodigesters	20	340 people				
		All sites	Supporting the establishment of farms in the villages	Not carried out because of the political situation					
		All sites	Analysing local governance of natural resources; then identifying actions to strengthen local governance of natural resources	Not carried out because of the political situation					
	2. Economic		Not carried out			No impact, not	No predicted	Not achieved	Annual report,

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Goal	Objectives	Sites	Activities	Results	Reach	Impact	Predicted outcomes	Realised outcomes	Means of assessment
	benefits of integrated ecosystem-based adaptation strategies on the reduction of rural poor communities' vulnerability are demonstrated		because of quality of work by organisation carrying out the valuation. (See Thailand logical framework)			done	outcome for this		2016,
	Capacity building		Village Development Committees established.	Committee meetings are held when required to implement activities at least once a month and at the end of the year (November) to assess the implementation of their business plan for the year in and develop a new plan for the coming year.	Each committee is composed of the president of the Village Development Council (VDC), a representative of the village chief, the two village councillors and two representatives of the women's associations	Communities involved in evaluation of progress and planning for the following year	3. The stakeholders trained on climate change adaptation mainstreaming tools, approaches and dialogues	Achieved with success	Information obtained from project coordinator
				Annual action planning	VDC		4. Stakeholders aware of the best adaptation strategies	Training has been mainly for communities and local stakeholders; national level training is lacking	As above
		All sites, for communities		Identification of technical and equipment needs	VDC				As above
			Seed production techniques for nurseries	Training carried out.	8 community members trained				Annual Report, 2016
			Supporting organic production in villages	Not carried because of severe rain.					Annual Report, 2016
			Composting techniques	Training in composting techniques carried out by Green Cross	30 native trainers able to replicate training in their community 39 participants including 30 practitioners, 6 agricultural officers and 3				Annual Report, 2016

Goal	Objectives	Sites	Activities	Results	Reach	Impact	Predicted outcomes	Realised outcomes	Means of assessment
					IUCN members were trained				
		Local and regional stakeholders	Workshop on Disaster Risk Reduction 29-30 April 2015	PEDRR training conducted by project coordinator Educated key stakeholders on the multiple benefits of ecosystem services for reducing disaster risk and sustainable development; integrating ecosystem management and reduction of disaster risk in the planning process; and promoting and facilitating intersectoral collaboration.	32 people, from specialised services, technical services, local authorities, governor and high commissioners and NGOs attended	It is understood that awareness has increased but focus has been restricted to local and regional stakeholders			IUCN. 2015
			Climate Change Adaptation Day in the Northern Region 1-2 April 2014	Promote the adoption of integrated adaptation processes in the Northern Region in which each actor will recognize and play its role	The participants were the representatives of the local authorities (14); Local communities (33); Local technical services (20); Research (9); Associations and local NGOs: (7); Projects and Programs (8); International Institutions				IUCN, CGIAR and CCAFS (2014 in DropBox

Goal	Objectives	Sites	Activities	Results	Reach	Impact	Predicted outcomes	Realised outcomes	Means of assessment
			Final EPIC workshop	Disseminating EPIC results	53 particiapnts: national partners, local authorities, technical services, local NGO, communities				
	Policy Influence	Local/ Regional and National	Participating in existing or emerging platforms of dialogue to which EPIC can be integrated	2 meetings of CONASUR and CNDD attended, engaging with the National Council for Emergency Relief and Rehabilitation	National	Recognition of the relevance of the Eco-DRR approach by the local authorities Commitment of the political authorities to support any initiative for an upscaling of the project achievements	No predicted outcome	Policy influence at national level has been weak as it is only just beginning	Information obtained from project coordinator
	Setting up multi-stakeholder platforms	National	Regional monitoring committee set up	21 people by order of the governor of Ouahigouya	Regional	The Committee has met at least 3 times, taking advantage of other meetings or workshops being organized (such as PEDRR training in 2014, Climate changes days" in 2014 and 2015).	A multi-stakeholder dialogue platform, comprised of government, NGOs, civil society established in target countries that use and promote nationally and provide input to the findings of the project.	Just commencing, no agendas, or plans of action for influencing policy	Annual Report, 2016. Arrete N°2014-/MATS/RNRD/GVR-OHG/SG in Dropbox, correspondence with project coordinator
	Learning and dissemination	In-country	PEDRR training workshop	Presentation: Links between development, ecosystems and disasters Presentation: Key	32 people (see above)	Limited reach of increasing awareness	No predicted outcome	In country dissemination, not adequate. No press releases, video not finalised	IUCN. 2015 Annual Report,

Goal	Objectives	Sites	Activities	Results	Reach	Impact	Predicted outcomes	Realised outcomes	Means of assessment
				concepts on DRR based on ecosystems				yet.	2016
				Presentation: Using ecosystems to increase the resilience of communities and infrastructure to natural hazards: the case of the EPIC project					Annual Report, 2016
			Visit of the EU Delegation	Presentation on the EPIC- Burkina project	20 people				Information obtained from project coordinator
			Climate change adaptation workshop	EPIC operational process	103 people				Workshop report 2014
				EPIC focus on West Africa and Burkina: Use ecosystems to increase the resilience of communities and infrastructure to natural hazards	Same as above				Workshop report 2014
			Video	Not completed yet					Annual Report, 2016
			Organizing the Climate Change Adaptation Days	Not carried out because of the political situation					Annual Report, 2016
		Inter-country learning	Study tour to EPIC Senegal	Completed	6 practitioners (including 3 women) benefited from this study tour	Limited to two events. However, impact from the Study tour was reported to be a success.	No predicted outcome	Inadequate, as above, restricted to two events	Annual Report, 2016, Trip report
			World Conservation Congress Sep 2016, Hawaii	Poster presented at side event. The role of traditional knowledge for adapting to climate change	Global	No way of measuring, but exposure would have been excellent			List of EPIC events at WCC sent by Global Programme Officer

Goal	Objectives	Sites	Activities	Results	Reach	Impact	Predicted outcomes	Realised outcomes	Means of assessment
				and related hazards					
				Knowledge café: Nature et catastrophes naturelles: quelle mise en œuvre?	Global				

8.   Annex 8: Logical Framework for EPIC Chile

Goal	Objectives	Sites	Activities	Results	Reach	Impact	Predicted outcomes	Realised outcomes	333Means of assessment
To quantify and optimise the value of mountain ecosystems in the reduction of risk associated with snow avalanches and other natural disturbances, such as rockfalls and debris flows.	2. To improve considerations regarding the effect of forests in avalanche simulation models	Biosphere Reserve Nevados de Chillán – Laguna del Laja in Central Chile's Biobío region (VIII) (221 km^2, with the lowest point located at 744 m a.s.l,. the highest point is 2526 m a.s.l.	The project site was defined based on a SLF diagnosis of several potential sites analysed by the Ministry of Environment according to their needs and priorities. The *Nevados del Chillán-Laguna del Laja* Biosphere Reserve was selected as a project site due mainly to the following criteria: i) snow avalanches as well as landslides problems in the upper part; ii) an important native forest area suitable for sustainable forest management and conservation; iii) vulnerable communities.						IUCN, SLF and Ministry of Environment 2013, (Baseline report), Casteller et al., 2016.
			Conduct a baseline study	Baseline report produced					IUCN, SLF and Ministry of Environment 2013in Dropbox
			Introduction to EPIC Chile	Inception Workshop held in Santiago on 3rd December 2013	24 participants, representing a variety of governmental and non-governmental organisations (NGOs) and research centres				IUCN, SLF and Ministry of Environment 2014, IUCN and Ministry of Environment, 2013; Inception report in Dropbox
			A vulnerability assessment workshop was held from 2nd-6th	16 innovations were identified: efficient use and re-use of water	24 participants representing local and regional				IUCN, SLF and Ministry of Environment 2013 in Dropbox

Goal	Objectives	Sites	Activities	Results	Reach	Impact	Predicted outcomes	Realised outcomes	333Means of assessment
			September 2013 in Valle Las Trancas – north-east of Biobío Region in the upper part of the Biosphere Reserve to a) raise awareness of current and future vulnerabilities to climate change faced by local actors; b) raise awareness of existing local innovations that can be utilised for adaptation; c) support social learning processes among different stakeholder groups based on local knowledge, experience and skills and d) initiate new forms of co-operation, leading to a critical review of current ways of working, The workshop applied the Promoting Local Innovations (PLI) toolkit designed by the CDE and used elements of the Climate Resilience Evaluation for Adaptation through Empowerment (CREATE) methodology to analyse risks and identify local capacities and 'innovations	resources; forest fire early warning system; sustainable management and conservation of native forests; organic agriculture; waste management and environmental education; biosphere reserve coordination agency; efficient water resource use and drinking water committee; sustainable native forest management and conservation observatory (*in situ*); clean technologies centre; genetic resource bank; rural drinking water committee; sustainable forest management and conservation (fire breaks); botanical garden; clean/ sustainable energy; biological corridors; and tourism foundation (engagement with local stakeholders)	governments and government agencies, research centres and universities, local business owners, national and local NGOs and local community representatives.				

Goal	Objectives	Sites	Activities	Results	Reach	Impact	Predicted outcomes	Realised outcomes	333Means of assessment
			Innovations were prioritised	1. Promote sustainable energy consumption by designing lighting solutions, building architectural designs, and encouraging sustainable firewood use, among others; 2. Create a water committee to regulate the sustainable use of water, including water use in the tourism sector; 3. Promote the sustainable management and conservation of native forests; and 4. Establish an agency to promote eco-tourism and conservation of the Biosphere Reserve.	Same as above.				IUCN, SLF and Ministry of Environment 2014, IUCN, 2013 in Dropbox

Goal	Objectives	Sites	Activities	Results	Reach	Impact	Predicted outcomes	Realised outcomes	333Means of assessment
			Follow-up Workshop September 2014 in Ecobox Andino, In the Valle Las Tranca, with the goal of sensitising the actors of the Biological Corridor Nevados de Chillán - Laguna del Laja Biosphere Reserve in the adaptation to climate change and disaster risk reduction and specifically, to Assess progress of implementation identified innovations and detail the next steps and to present the progress made in research on snow avalanches and other associated risks and next steps	Innovation 1: The Regional Government of Biobío adopted the innovation to promote sustainable energy consumption. a Clean Production Agreement (APL) was reached with the tourism sector in the town of Pinto. An act constituting the Negotiating Committee was signed and a series of meetings and workshops was planned during the month of January 2015, to define goals and objectives to be achieved with this agreement.	35 participants, from diverse governmental and non-governmental organizations, including academia.				
				Innovation 2, 3, and 4. Due to the absence of IUCN absence in Chile and lack of ownership from local stakeholders, the work on the innovations did not move forward as planned. In 2015, it was decided that instead of implementing the innovations, a comprehensive study of the biosphere	Same as above				

Goal	Objectives	Sites	Activities	Results	Reach	Impact	Predicted outcomes	Realised outcomes	333Means of assessment
				reserve's natural resource management see below					
				Innovation 3: promotion of sustainable forest management.	During the last year of the project, EPIC has been generating knowledge that will directly help to improve associativity of the local-key stakeholders and to raise awareness about adopting Eco-DRR and EbA approaches. Also, knowledge has been enhanced with the research on the role of forests, forest ecosystem services local perceptions research and diverse workshops.				

Goal	Objectives	Sites	Activities	Results	Reach	Impact	Predicted outcomes	Realised outcomes	333Means of assessment
	3. To analyse the avalanche hazard while keeping in mind the diverse scenarios for climate change and use of soil	Same as above	• Mapping of avalanche tracks and potential avalanche release zones in the study area of the Biosphere Reserve and Biological Corridor Nevados de Chillan. Mapping of secondary disturbances such as rocks falling and landslides	• Avalanches are the most frequent and nowadays spatially most important disturbance regime in the study area; • Potential rockfall areas are the second most important disturbance in the area. • Map developed	National		1. An identification of the sectors at the study area where natural hazards represent a threat for communities and/or infrastructure.	Achieved	Casteller et al., 2016, Häfelfinger, 2015 — both in DropBox
			Reconstructing avalanche history, dating former avalanches (using dendrochronology — analyses of tree rings — and terrain observations)	• Nevados de Chillán has a rich history in natural disturbances. In the past, many avalanches and debris flow events occurred. • In the years 1995 and 2000, avalanches occurred in many tracks.	National		2. Through the use of tree-ring methods and a compilation of historical archives, to obtain a record of past natural disturbances threatening communities at the study area. 3. Using the simulation program RAMMS, an elaboration of susceptibility maps at a local scale for sectors of the study area where natural hazards represent a threat for communities or infrastructure	Final scientific paper being developed (both in Spanish and English)	Casteller et al., 2016, Häfelfinger, 2015 — both in DropBox

Goal	Objectives	Sites	Activities	Results	Reach	Impact	Predicted outcomes	Realised outcomes	333Means of assessment
			• Preparing and conducting preliminary avalanche modelling using the software Rapid Mass Movement (RAMMS). • Avalanches return periods of 10 and 100 years were simulated to quantify the protective effect of forests against avalanche	• Avalanches and debris flows lead to a reduction of canopy density and age of the forest (but not to tree diameters.) • Tree heights are reduced in avalanche disturbed forests significantly, but increased in forests disturbed by debris flow compared to not disturbed forests. • Simulations showed that forests considerably reduce the impact pressure on the road as well as the spatial extent of the runout. Scenarios with additional afforestation suggest that such measures would contribute to lower maximum impact pressures and reduced avalanche frequencies, but cannot avoid that avalanches reach the road.	National				Casteller et al., 2016, Häfelfinger, 2015 — both in DropBox

Goal	Objectives	Sites	Activities	Results	Reach	Impact	Predicted outcomes	Realised outcomes	333Means of assessment
				• In areas where information about past avalanches is missing, the combination of avalanche simulations with dendrochronological methods is helpful for risk assessment.					
	4. To promote the optimised management of mountain ecosystems.		Literature review about ecosystem services in the Biosphere Reserve aimed at giving an estimation of values for local communities. (ecosystem services provided by forests).	• List of scientific papers provided • A literature survey of 211 documents was carried out, but few studies assessed the ecosystem services carried out by forests. Some studies promoted the existence of forests as important to decrease the occurrence and the impact of avalanches but there were no specific studies assessing the benefits that forests could provide to protect communities.	National		4. A list of suggestions to local, regional and national forest offices on forest management that can reduce the hazard related to the occurrence of snow avalanches at the study area.	Lit survey carried out but ecosystem services have been restricted to regulating services (specifically hazard mitigation); provisioning (specifically of water). Other services — in particular, the supporting services (carbon sequestration) and cultural services (tourism) have not been reviewed.	SLF, 2014_ in DropBox Cortes-Dononso et al, 2015 n Dropbox

Goal	Objectives	Sites	Activities	Results	Reach	Impact	Predicted outcomes	Realised outcomes	333Means of assessment
			Inputs/inclusion into national plan/ implementation: National Plan for Adaptation to Climate Change in Biodiversity	Prepared by the Ministry of Environment (2014); included EPIC as an exemplary measure of adaptation to climate change that contributes to the strengthening of the National System of Protected Areas	National		5. Tailored policy message in the country	There is more discussion on Eco-DRR after the EPIC project and there is now an increasing interest to build a research agenda and get the scientists involved. Different localities from with the biosphere reserve are now working together and at the level of the biosphere now. Policy influence has been excellent and with multiple entries	Ministerio del Medio Ambient (2014). in Dropbox; interviews
			Inputs/inclusion into national plan/ implementation: Land-use planning	Results of SLF study have been given to the regional government through the Ministry of Environment Follow-up actions are needed to assure that these data are understood and integrated into the Regional Land-use EPIC shared some ideas of eco-engineering and green-grey infrastructure options with the Ministry of Public	Regional (Biobío).				Annual Report, 2016

Goal	Objectives	Sites	Activities	Results	Reach	Impact	Predicted outcomes	Realised outcomes	333Means of assessment
				Works (MOP) as an alternative to conventional grey infrastructure in the main road at the study site.					
			Inputs/inclusion into national plan/ implementation: Local forest management	Local stakeholders (municipalities, public services). Are now being more careful about risk management in the biosphere reserve.					Interview.
			Inputs/inclusion into national plan/ implementation: National Geology and Mining Service (SERNAGEOMIN) developing a National Geological Hazards' Map	Potential collaboration with to study landslide processes in the Coquimbo region (and later in the Metropolitan and Valparaíso regions).					Annual Report, 2016

Goal	Objectives	Sites	Activities	Results	Reach	Impact	Predicted outcomes	Realised outcomes	333Means of assessment
			Inputs/inclusion into national plan/ implementation: biodiversity policy	Alignment to the Ministry's objectives regarding EcoDRR and EbA in the MMA, as well as the policies and strategies at the national level, and supports the sectoral biodiversity CCA Plan.					Interviews.
	Capacity building and dissemination	Valle Las Trancas, located in the upper part of the Reserve	EPIC climate vulnerability and capacity assessment workshop 2014	The role of ecosystems in reducing risks and in adapting to climate change has increased.	35 participants (local)		6.Establishment of a Multi-stakeholder dialogue platform	Achieved. See organigramme in Figure 21, but the focus has been on policy influence so lacks the true range of stakeholders, such as the private sector.	Annual Report, 2016
		Santiago	Seminar-workshop Ecosystems protecting infrastructure and communities 2013	The role of ecosystems in reducing risks and in adapting to climate change has increased.	24 participants (local)				Annual Report, 2016

Goal	Objectives	Sites	Activities	Results	Reach	Impact	Predicted outcomes	Realised outcomes	333Means of assessment
		Las Trancas	EPIC Follow-up workshop 2014		24 participants (local)				
		Santiago	Management and conservation of ecosystems as an alternative for the risk reduction from disasters 2015	Increased awareness	30 national participants				
		Chillán (local)	Workshop on the role of ecosystems and biodiversity for CCA and DRR in the Biosphere Reserve Oct 2016	Increased awareness	34 participants from diverse public services, NGOs, academia and public sector				

Goal	Objectives	Sites	Activities	Results	Reach	Impact	Predicted outcomes	Realised outcomes	333Means of assessment
		Santiago (national)	Seminar on ecosystem based approaches for CCA and DRR organised jointly with the Ministry for Environment (MMA), Jan 2017	Increase awareness	50				Latest summary of workshops and meetings sent byChile programme manager
			Webinar strengthening EbA effectiveness evidence, where EPIC - Chile was presented as a case study	Increase awareness	Online 70 participants, national level				
		Las Trancas (local level)	Adaptation in the Bío Bío region: natural and local solutions strategies to face the climate change workshop Sept 2013	Increased awareness	24 particpants				Latest summary of workshops and meetings sent byChile programme manager

Goal	Objectives	Sites	Activities	Results	Reach	Impact	Predicted outcomes	Realised outcomes	333Means of assessment
		Chillan (local)	Capacity building workshop Oct 2016	Increased the knowledge, awareness and capacities regarding the role of ecosystems, and biodiversity for CCA and DRR in the Biosphere Reserve.	34 particpants				Latest summary of workshops and meetings sent byChile programme manager
		Santiago (national)	Seminar/workshop 2016	Increased knowledge/ awareness on ecosystem based approaches for CCA and DRR.	70 from NGOs, academia and civil society, including the Minister of Environment and the senator of "Comisión Desafíos del Futuro				Latest summary of workshops and meetings sent byChile programme manager
		Santiago (national)	Seminar "Infraestructura verde y ciudades sustentables en Chile - Corredores Verde Presentation EPIC - the role of ecosystems in DRR and CC Jan 2017	Increased awareness	50				Latest summary of workshops and meetings sent byChile programme manager

Goal	Objectives	Sites	Activities	Results	Reach	Impact	Predicted outcomes	Realised outcomes	333Means of assessment
		Santiago (national	EPIC final workshop Apr 2017	To disseminate EPIC results	30				Latest summary of workshops and meetings sent byChile programme manager
	Meetings	Satiago (national)	Introducing EPIC to implementing partners	Presentation on EPIC – Chile.	10-15				Latest summary of workshops and meetings sent byChile programme manager
		Chillan (local)	Introduce EPIC to key stakeholders in the Biosphere Reserve	Presentation on EPIC – Chile	24				Latest summary of workshops and meetings sent byChile programme manager

Goal	Objectives	Sites	Activities	Results	Reach	Impact	Predicted outcomes	Realised outcomes	333Means of assessment
		Satiago (national)	Introduce EPIC to key stakeholders in Santiago May 2013	Presentation on EPIC – Chile	24				Latest summary of workshops and meetings sent byChile programme manager
		Concepción (local)	SEREMI MA Biobío, Steering Committee of the Biosphere Reserve, majors of the communities and the chair of the Management Council of the BR Sept 2014	Progress of EPIC-Chile	15				Latest summary of workshops and meetings sent byChile programme manager
		Concepción (local)	Meeting with the Regional Government (responsible of the management of the BR) to discuss the progress made with the project and the next steps. Sept 2014	Progress of EPIC-Chile	10				Latest summary of workshops and meetings sent byChile programme manager

Goal	Objectives	Sites	Activities	Results	Reach	Impact	Predicted outcomes	Realised outcomes	333Means of assessment
		Concepción (local)	Executive Committee of the Biosphere Reserve "Los Servicios Ecosistémicos del bosque nativo para la Reducción de Riesgos de Desastres (RRD) y la Adaptación al Cambio Climátco (ACC)" Ma 2016	Progress of EPIC-Chile	?				Latest summary of workshops and meetings sent byChile programme manager
		Concepción (local)	Ministry of Public Infrastructure (MOP)	They were interested in the results of the avalanche study (SLF) in order to assess and hopefully implement an infrastructure alternative to safeguard the road risks from landslides and avalanches in the valley Las Trancas (same study site of SLF	5				Latest summary of workshops and meetings sent byChile programme manager
		Concepción (local)	Meeting with stakeholders to discuss final workshop Mar 2017	Progress of EPIC-Chile	4				Latest summary of workshops and meetings sent byChile programme manager

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Goal	Objectives	Sites	Activities	Results	Reach	Impact	Predicted outcomes	Realised outcomes	333Means of assessment
		Santiago (national)	Presentación en la reunión de trabajo con el Ministerio de Ambiente June 2016	Progress of EPIC and next steps	12				Latest summary of workshops and meetings sent byChile programme manager
		Inter country	World Parks Congress in Sydney, Australia 2014	Relationship between EPIC project plans and strategies for adapting to climate change at regional and national level presented	24 people listened to the presentation				Latest summary of workshops and meetings sent byChile programme manager
			International Disaster Risk Forum (IDRC), Davos 2014	Presentation of the EPIC Chile case studies	150 people listened to the presentation				Latest summary of workshops and meetings sent byChile programme manager

Goal	Objectives	Sites	Activities	Results	Reach	Impact	Predicted outcomes	Realised outcomes	333Means of assessment
		Chillan	International conference Analysis and Management of Changing Risks for Natural Hazards 2014	Presentation: Evaluation of the protective capacity of forests against snow avalanches in the Chilean Andes	34 international				
			Case study "Protecting against snow avalanches or landslides with forests on steep slopes: The case of the Biosphere reserve Nevados de Chillan, Chile"	In Protected Areas as Tools for Disaster Risk Reduction	On line webinar 70				https://portals.iucn.org/library/sites/library/files/documents/2015-001.pdf
		Buenos Aires	Taller Regional "Reducción de Riesgos de Desastres basada en Ecosistemas: el rol de la biodiversidad" Mar 2017,	Dissemination of EPIC results	38				

Goal	Objectives	Sites	Activities	Results	Reach	Impact	Predicted outcomes	Realised outcomes	333Means of assessment
		Global	Fact sheet about EPIC Chile	Information brief and preliminary results	Online, global				https://www.iucn.org/sites/dev/files/content/documents/factsheet_epic_bosques_2015.pdf
		South America	Present EPIC and its first results to South American members and partners	EPIC case study in the IUCN-SUR 2013 annual report	106 members but probably sent to a larger list				http://www.flipsnack.com/Manthra/reporte-anual-2013-uicn.html
			Book - Disaster Risk Reduction. Case study "Protecting against snow avalanches or landslides with forests on steep slopes: The case of the Biosphere reserve Nevados de Chillan, Chile"	EPIC Chile showcased	Global				https://portals.iucn.org/library/sites/library/files/documents/2015-001.pdf

Goal	Objectives	Sites	Activities	Results	Reach	Impact	Predicted outcomes	Realised outcomes	333Means of assessment
			3 fact sheets; To communicate EPIC's goals and results	EPIC Chile progress disseminated					http://cmsdata.iucn.org/downloads/factsheet_epic_bosques_2015_octubre_1.pdf https://www.iucn.org/sites/dev/files/content/documents/factsheet_epic_2016-nov.pdf
			Infographic and Brief to present EPIC and its first results to South American members and partners	EPIC Chile progress disseminated					http://www.flipsnack.com/Manthra/reporte-anual-2013-uicn.html
			15 news stories in various online sites from 2013 -2017	EPIC Chile showcased					Inter alia http://www.iucn.org/es/sobre/union/secretaria/oficinas/sudamerica/sur_noticias/?13820/1/EPICVulnerabilidadTaller https://www.facebook.com/UICN.SUR/posts/10154329768282130?pnref=story

Goal	Objectives	Sites	Activities	Results	Reach	Impact	Predicted outcomes	Realised outcomes	333Means of assessment
			Policy brief prepared 2015	Informed policy makers about EPIC					
			Case study Chile: Quantifying and improving the protective capacity of forests against snow avalanches	Progress of scientific research	Online				https://www.iucn.org/sites/dev/files/content/documents/epic_chile_technical_report_slf_esp_kp_ac_mc_final_16sept16.pdf
			Facebook page	EPIC Chile showcased through social media					https://www.facebook.com/UICN.SUR/

Goal	Objectives	Sites	Activities	Results	Reach	Impact	Predicted outcomes	Realised outcomes	333Means of assessment
			Video about EPIC (launched in 2015) with English subtitles.	EPIC Chile showcased through social media					https://www.youtube.com/watch?v=HK_QYxdcDA0

9. Annex 9: Logical Framework for EPIC China

Goal	Objectives	Sites	Activities	Results	Reach	Impact	Predicted outcomes	Realised outcomes	Means of assessment
Native plant species playing a key role in stabilising slopes will be identified, and relevant planting mixtures of these species established in the target hillside landscapes (Yunnan, China) within five years.	1. Investigated the use of eco-engineering for the stabilisation of steep slopes	Near Daxingdi village, north of Liuku town on the banks of the Salween River in China's Yunnan Province: Study site # 1 is an active shallow landslide approximately 30 m wide and 50 m long (considered as a degradation hotspot); slope angle is 35-45° Study Site # 2 3 m from the first site now colonised with vegetation; slope angle 50-60° (considered relatively stable)	Was selected because: (i) many landslides are present because of road building & monsoon rains (ii) the region is a hotspot of plant diversity (large parts of Yunnan are dominated by a small number of species) and (iii) had very steep slopes						IUCN, ProAct and INRA (2013a) in Dropbox
			Conduct a socio-economic baseline study	Baseline report produced					IUCN, ProAct and INRA (2013a) in Dropbox
			Introduction to EPIC China Inception workshop 1. to launch the EPIC project in Yunnan by informing and building awareness; 2. to exchange information on the reduction of slope stability hazard and climate change and the role ecosystem-based with the goal to support future networking, collaboration and synergies; 3. to introduce how vegetation can be used to prevent shallow landslides and erosion; and 4. to establish connections with	Inception Workshop held in the XTBG office in Kunming by INRA, IUCN China, and the International Arboriculture Summit (Hong Kong). Additional representation was from the XTBG and ProAct Network.	In Kunming = 25 participants. In Hong Kong = 150 participants.		1. Vegetation, geomorphology and pedology of the field site characterised.	Achieved	IUCN, ProAct and INRA (2013c) in Dropbox IUCN 2014 in Dropbox

Goal	Objectives	Sites	Activities	Results	Reach	Impact	Predicted outcomes	Realised outcomes	Means of assessment
			partners – government agencies, NGOs, communities – in terms of learning lessons to be applied to practice and inform policy.						
			Two VCA reports were created: one at a general level (Salween River Valley) and the second at a more local level (Liukou town). A comprehensive assessment of landslide vulnerability in the Salween River valley was also carried out and measured landslide erosion along seven unpaved road segments in the upper drainage basin and calculated sediment delivery rates into the	• Measured rates of landslide erosion were extremely high. At one site, a rate of erosion of 48,235 Mg ha-1 yr-1 is the highest ever reported along a mountain road corridor. • Cut slope landslides were more frequent at all study sites; Fill slope failures had a combined mass >1.3 times that of cut slope failures; and the mean mass of individual fill slope landslides was four times higher than cut slope slides. • The delivery of landslide sediment to the Salween River and its tributaries was >45 per cent; delivery from four of the road segments was greater than 74%.	National				Two project reviews; IUCN, ProAct and INRA (2013b) in Dropbox Sidle et al 2014

Goal	Objectives	Sites	Activities	Results	Reach	Impact	Predicted outcomes	Realised outcomes	Means of assessment
				Published scientific paper in peer-reviewed journal					
			Identification of plant species at field site — considering their community and ecosystem services. Seventy species were identified; nine species were studied in detail in the field. Three species were studied extensively through laboratory tests: *Jatropha curcas; Rhus chinensis;* and *Ricinus communis*	Published scientific paper in two peer-reviewed journals 5. A mixtures of different specie sis better than a monoculture; 6. Reinforcement by roots must be accompanied by limiting the increase of soil water content	Global		2.Mechanical soil-root interactions characterised.	Achieved	Ghestem et al 2014. Veylon et al., 2015 Veylon et al., 2015
			Running of a slope stability model to enable stakeholders to decide the best mix and spatial pattern of species to plant on a fragile slope	Negligible influence of vegetation on bare soil for the first 10 years after a disturbance (removal of vegetation)			3.Biomechanical properties of roots understood. 4. Ten native species that are able to play a key role in stabilising slopes are identified and characterized, and related slope Factor of Safety (FOS) is determined.	Achieved	To be reported in final report
			Development of a conceptual framework to help local communities choose species to stabilise slopes	Published scientific paper in a peer-reviewed journal The Stability Database has been developed to aid the site manager choose the most suitable species fields where data can be entered to	Global		5. A database of plant species is created and available.	Achieved	Perez et al., 2017; en Condes-Salazar R 2016 MSc thesis (in French)

Goal	Objectives	Sites	Activities	Results	Reach	Impact	Predicted outcomes	Realised outcomes	Means of assessment
				describe the observed element.					
			Measurements of water infiltration and soil erodibility performed in natural and rubber plantation forests in the Yunnan. Further infiltration tests in the laboratory in selected species from Daxingdi.	'In tropical ferralsols, fine roots and understorey vegetation play a positive role in promoting subsurface flow and reducing water erosion. Therefore, planting mixtures that include a diversity of species and strata would improve significantly soil conservation.	In press, Ecological Engineering				Nespoulous et al., in press J. Nespoulous PhD thesis 2016
				Recommendations to promote to multi-disciplinary knowledge to enhance the acceptance of eco-engineering design in conventional civil engineering. Transfer of knowledge between geoclimatic conditions is also recommended. .	In press, Forensic engineering				Tardio et al, in press.
			Validation of a GoogleEarth tool for identifying and quantifying shallow landslides and erosion	Was a useful tool in detecting only larger geo-hazards if applied carefully, and is therefore applicable in merely identifying geo-hazard hotspots. The	Not published yet, but will be global		6.The number and size of shallow landslides are quantified using Google Earth.

7. transfer of results and knowledge - transfer methods for a holistic approach | Achieved

Not achieved | Voermans, MSc thesis 2016 |

Goal	Objectives	Sites	Activities	Results	Reach	Impact	Predicted outcomes	Realised outcomes	Means of assessment
				usability for further assessments such as sediment delivery estimations is questionable. Further research is needed			of mechanical reinforcement of soils by vegetation (through workshop and creation of dedicated PEDRR case study)		
	2. Policy influence (not defined as an objective, but only as an outcome		1. Analysis of China Climate Change Policies	A review of China's policies for Climate change adaptation and EbA Policies	National		Targeted policy message	Not achieved	IUCN (2015a) in Dropbox
			2. Report on Major Programmes about Climate Change Adaptation in China	8 ongoing national projects	National				IUCN (2015b) Sent by Project coordinator
			3. Advocating for the Eco-DRR to be better accepted by Chinese authorities	The National Disaster Reduction Center (NDRC) participated in the IUCN World Conservation Congress, assisted by IUCN China. Strengthened cooperation with the NDRC. Essentially the message is that Eco-DRR is effective according to EPIC experience; Eco-DRR is highlighted in the Sendai framework. IUCN would like to cooperate with NDRC on Eco-	National				Formal communication - in Chinese. In Dropbox

Goal	Objectives	Sites	Activities	Results	Reach	Impact	Predicted outcomes	Realised outcomes	Means of assessment
				DRR					
			4. Lead the establishment of a national policy platform	Two initiatives are ongoing: The Water Salon sponsored by IUCN China, WWF China, WRI China and GWP China. This is a platform aiming to influence the water sector. Collaboration with Chinese Forestry Society on regular training has been formalised and included in the MOU with the State Forestry Administration Aim is that DRR should be considered in the water resource management; Risks of slope instability caused by hydro-power should be integrated in its planning	The Water Salon: about 20 people, meeting on annual basis.		A multi-stakeholder dialogue platforms, comprised of government, NGOs, civil society established that uses and promotes nationally and provide input to the findings of the project.	Achieved. See organigramme in Figure 15, but lacks true range of stakeholders, such as the private sector.	In Chinese in Dropbox
			Collaborations were reinforced between INRA and the Chinese Academy of Science, Chinese Society of Forestry and the Chinese Society of Ecology.	Visits between ex-secretary of State Administration of Forestry and President of Chinese Society of Forestry, Vice president of the Chinese Academy of Forestry, President of Chinese Society	Will be national				Annual Report 2016 (sent by EPIC global programme officer)

Goal	Objectives	Sites	Activities	Results	Reach	Impact	Predicted outcomes	Realised outcomes	Means of assessment
				of Ecology, Vice President and Secretary General of Chinese Society of Forestry INRA staff) took place at Montpellier in August and in Beijing in October 2016. INRA is leading discussions with colleagues concerning the future scientific collaborations in the field of forest ecology between INRA and the Chinese Academy of Sciences.					
	Capacity building	Kunming	1. Local capacity building workshop and site monitoring based on the VCA 2015	Objective was to introduce EPIC and its approach and results to the stakeholders in Yunnan, gather the local knowledge on Eco-DRR and EbA, to build a better understanding among a network of experts to integrate EcoDRR and EbA in the programmes and initiatives in Yunnan.	Organised by IUCN China and the Center for Rural Development Studies, Yunnan University for 20 people				Summary of the Workshop on Eco-DRR and EbA at Kunming, China, undated, presumably. 2015
		Beijing	2. EPIC Training Workshop for stakeholders in China 2014	Objective was to bring together experiences and lessons from China and internationally in ecosystem	52 participants from 20 organizations, from the governments, research organisations,				IUCN, INRA and CSF ,2014 in Dropbox

Goal	Objectives	Sites	Activities	Results	Reach	Impact	Predicted outcomes	Realised outcomes	Means of assessment
				restoration and management, in light of reducing the disaster risks and increase the resilience and resistance of nature and communities in response to climate change.	NGOs, UN organisations and the private sector.				
		Hong Kong		International Arboriculture Summit - Hong Kong. "Hanging by Their Roots, Trees and Slippery Slopes" (arboricultural-bioengineering principles for challenging environments).					http://www.ias.hk /index.php?optio n=com_content& view=category&l ayout=blog&id=2 &Itemid=17&limit start=1
			Vulnerability Capacity Assessment (VCA) for Upper Salween	Recommendation s are Integrate community-based adaptation(CBA) and EbA approaches to climate change adaptation. In current EbA, the criteria for success is the survival rate of trees planted and forest coverage. CBA can add value from the traditional ways of natural resource management, which are low cost and time tested, and also increase the degree of ownership.	Provincial				Yusong, undated. Report sent by IUCN project coordinator

Goal	Objectives	Sites	Activities	Results	Reach	Impact	Predicted outcomes	Realised outcomes	Means of assessment
		Beijing	Final EPIC workshop 2017	Disseminated EPIC results, Promotion of EPIC and Eco-DRR among policy makers, researchers and practitioners; knowledge sharing	40 participants from 5 sectors /ministries (Disaster, Forest, Environment, Water, Communications	Opportunities and priorities for the future			
	Learning and dissemination	In country	EPIC China brochure	Introducing EPIC China and its objective	100 hard copies, disseminated mostly to event participants. E-version circulated more widely.				Brochure in Chinese, in Dropbox
			EPIC video	Ongoing, not yet completed					Annual report 2016
			EPIC China slides	Developed EPIC slides in Chinese and used it for over 8 events from 2014-2016 Including	See blow				Presentation in Chinese, sent by IUCN China Project Coordinator
		Beijing	EPIC China slides	Annual workshops of conservation organisations, organised by State Forestry Administration in 2014, 15 and 16	Over 30 participants, including 20 NGO people and 10 SFA people				
		Beijing		Annual IUCN members' meetings in 2014-2016	About 30 participants, including 5 government offices.				

Goal	Objectives	Sites	Activities	Results	Reach	Impact	Predicted outcomes	Realised outcomes	Means of assessment
		Beijing	EPIC China slides	Water Blueprint workshop in 2015 organized by TNC	Over 50 participants				Listed by the Project coordinator
		Beijing	EPIC China slides	Forest landscape restoration workshop in 2016,	Over 60 participants, including 40 government officers				Listed by the Project coordinator
		Beijing	Presentation on Using Vegetation for Protecting Against Shallow Landslides in the Nujiang valley.	to inform Yunnan partners (University, Institute of Botany, Chinese Academy of Science) during an EPIC workshop	Not available				
			Presentation Introducing the work advancement to EPIC implementing partners (XTBG Yunnan)	Mao Z, Wang Y, McCormack ML, Rowe N, Deng XB, Xia SW, Nespoulous J, Sidle RC, Stokes A, Guo DL 2015 Characterization of root quality and its impact on slope stabilization	xxx				Communications inventory, sent by Implementing partner
		Inter country	Publication of scientific papers	Title: Epic landslide erosion from mountain roads in Yunnan, China – challenges for sustainable development.	Global				Sidle, et al., 2014 in Dropbox folder
				Title Quantification of mechanical and hydric components of soil reinforcement by plant roots.	Global				Veylon, et al., 2015 in Dropbox folder
				Title: A framework for identifying plants to be used as ecological engineers for	Global				Ghestem et al., 2014 in Dropbox folder

Goal	Objectives	Sites	Activities	Results	Reach	Impact	Predicted outcomes	Realised outcomes	Means of assessment
				fixing soil on unstable slopes					
				Title Ecological mitigation of hillslope instability: ten key issues facing researchers and practitioners	Global				Stokes et al, 2014 in Dropbox folder
				Title Ecological engineering for soil remediation in China Western Province of Yunnan Province	Internal INRA				Bolot et al (2014) – supervised by Stokes
				Title Engineering the ecological mitigation of hillslope stability research into the scientific literature (editorial)	Global				Stokes et al. 2014
		Posters		Poster presented at the 2nd WASWAC (World Association of Soil and Water Conservation) world conference 20134	Influence of tree root systems on subsurface flow and implications for slope stability				
				: WASWAC 2013. Influence of tree root systems on subsurface flow and implications for slope stability. J. Nespoulous & A. Stokes	Congress with 1000 participants, Chiang Rai, Thaïlande) - The 2nd WASWAC (World Association of Soil and Water Conservation) world conference				PPT not available
				: An open access database of plant species useful for controlling soil erosion and	100 participants. 4th international conference on Soil Bio- and Eco-engineering				PPT not available

Goal	Objectives	Sites	Activities	Results	Reach	Impact	Predicted outcomes	Realised outcomes	Means of assessment
				substrate mass movement. J. Perez, R. Condes Salazar, A. Stokes	- "The Use of Vegetation to Improve Slope Stability" Sydney, Australia 2016				
				Michiel Voermans & Zhun Mao Geo-hazard detection through Google Earth imagery of The Three Parallel Rivers region, China	Poster to be presented at EGU Vienna, April 2017. 10 000 attendees				
			Presentations	EcoSummit 2016, Montpellier, Paying for protection: well-meaning but misguided PES for disaster risk reduction A. Stokes, G. Angeles, H. Cottler, S. Devkota, Z. Mao, C. Proisy, K. Sudmeier)	this talk				Annual Report 2016 (sent by EPIC global programme officer)
				Alexia Stokes Alexia Stokes Optimal tree root system architectures for planting on slopes given at International Arboriculture Summit - Hong Kong. "Hanging by Their Roots, Trees & Slippery Slopes" November 19-21, 2014.	150 attendees – practitioners in the field of tree care (foresters, urban foresters) and geotechnical engineering				In drop box
				Alexia Stokes Natural hazards in forests - does time heal all	130 attendees from scientific and applied background of				Listed by INRA PPT not available

Goal	Objectives	Sites	Activities	Results	Reach	Impact	Predicted outcomes	Realised outcomes	Means of assessment
				wounds? IUFRO conference Utah, USA	forest science				
				Ma Wenzhang and Alexia Stokes Using Vegetation for Protecting Against Shallow Landslides in the Nujiang valley An Ecosystems Protecting Infrastructure and Communities (EPIC) Project	Talk given at the Local capacity assessment and site monitoring based on the VCA 2015 (see report above)				In drop box
				The hidden half of vegetation on slopes – understanding reinforcement by roots. A. Stokes. Forum "Inestabilidad de laderas en el Estado de Veracruz: necesidades de investigación y búsqueda de soluciones" 6-7 november 2014, Mexico	350 attendees from INECOL Research centre, CONACYT Research (government level), local government, local civil security and defence, local military, local geotechnical engineers from public services and private companies				Listed by INRA PPT not available
				European Geosciences Congress 2014 (EGU) Vienna. A. Stokes & M. Ghestem. Searching for optimal plant root system architectures for preventing soil loss on slopes	150 attendees from academic background (soil science)				Listed by INRA PPT not available
				Mao Z, Wang Y, McCormack ML, Rowe N, Deng XB, Xia SW,	Talk given at EPIC seminar, XTBG, Yunnan to 50 scientists				In Drop box

Goal	Objectives	Sites	Activities	Results	Reach	Impact	Predicted outcomes	Realised outcomes	Means of assessment
				Nespoulous J, Sidle RC, Stokes A, Guo DL 2015 Characterization of root quality and its impact on slope stabilization	and students				
				How biologically formed macropores influence subsurface flow and stability along forested slopes - Case of study in Xishuangbanna, China. J. Nespoulous, RC Sidle, A. Stokes	Talk given at EPIC seminar, XTBG, Yunnan to 50 scientists and students				Listed by INRA PPT not available
				IWL 2015. The Fourth Italian Workshop on Landslides - 22-26th Nov. 2015 - Naples, Italy How biologically formed macropores influence subsurface flow and stability along forested slopes - Case of study in Xishuangbanna, China. J. Nespoulous, RC Sidle, A. Stokes	100 attendees at this conference. Attendees were academics and practitioners from a geotechnical and geological background				Listed by INRA PPT not available
				The hidden half of vegetation on slopes – understanding reinforcement by roots. A. Stokes. Workshop organised at Pokhara, by UNIL & IUCN Nepal	100 attendees at EPIC workshop (see report by UNIL and IUCN Nepal)				Listed by INRA PPT not available.

Goal	Objectives	Sites	Activities	Results	Reach	Impact	Predicted outcomes	Realised outcomes	Means of assessment
			Introduce the EPIC to the RCF participants	Presentation on EPIC					
			Presentation on EPIC China at the European Geosciences Congress 2014 (EGU)	Presentation on EPIC	Global				
			XXIV IUFRO World Congress 2014 – Salt Lake City, UT, United States, 5-11 October 2014. "Sustaining Forests, Sustaining People: The Role of Research	Presentation on EPIC	Global				http://www.iufro2014.com/
			Invitation to Natural Hazards Workshop, November 2014, in Mexico	Presentation on EPIC	Global				
			Water Blueprint workshop in 2015 organized by TNC	External meetings, including, over 50 participants, and the FLR workshop in 2016, over 60 participants, including 40 government					

10. Annex 10: Logical Framework for EPIC Nepal

Goal	Objectives	Sites	Activities	Results	Reach	Impact	Predicted outcomes	Realised outcomes	Means of assessment
The goal of EPIC Nepal is to build resilience to landslide risk through the	1. Enhance local knowledge and national uptake of bio-engineering for eco-safe roads	i. Gharelu Sarangkot in the Kaski district Bio-engineering	• Construction of three road side drainage canal to control drainage of water	Drainage controlled.	Altogether about 444 community members have	Ecosystems, health and services have improved: degraded	1. Three demonstration bio-engineering sites are established along road sides,	1. Three demonstration bio-engineering sites have	Direct on-site observation; EPIC, 2016 IUCN, 2016; final national

Goal	Objectives	Sites	Activities	Results	Reach	Impact	Predicted outcomes	Realised outcomes	Means of assessment
demonstration of 'eco-safe' roads. This comprises up-scaling the use of ecosystem services along rural roads for landslide stabilisation.		along a 95 m stretch			benefited in total in all three sites.	slopes have been stabilized and soil properties have been improved because of bio-engineering; in Tilahar, a 95% reduction in soil erosion has been observed (supporting services have improved); provisioning services have also been improved as communities are now receiving benefits from harvesting grass.	demonstrating 'eco-safe' roads. Case studies are documented and disseminated.	been established along road sides, demonstrating 'eco-safe' roads. Case studies have been documented and disseminated. (See results for Objectives 2,4 and 6)	workshop presentations; interviews
			• Construction of a dry stones wall along the water path coming from upper parts to control drainage from upper parts towards the culvert avoiding water overpassing	Drainage controlled and controlled for further soil erosion.					Direct on-site observation; EPIC, 2016 IUCN, 2016; final national workshop presentations; interviews
			• Construction of a bamboo wattling in a steeper slope zone to retain soil mass spreading from the road to cultivated terraces	Soil mass retained and the slope improved.					Direct on-site observation; EPIC, 2016 IUCN, 2016; final national workshop presentations; interviews; interviews
			• Established a rhizotorn to experiment with plant adaptation in relation to climate change.	Rhizotorn established and growing well. Nearly 20,000 seedlings were planted in the three demonstration sites					Direct on-site observation; EPIC, 2016 IUCN, 2016; final national workshop presentations; interviews
			• Plantation of several types of plants on the upper and lower road embankment	The community now sells broom grass and receives an income, a joint bank account has been opened, so that these funds may be used to extend/maintain the bio-engineering works					Direct on-site observation; EPIC, 2016 IUCN, 2016; final national workshop presentations; interviews
			• Nursery established and is managed by the DSCO which distributed plants.	Capacity in Oct 2016 is 50,000 seedlings			2. Three District Soil Conservation Office / community-based nurseries are enhanced, to include bio-engineering	2. Two District Soil Conservation Office / community-based	EPIC, 2016 IUCN, 2016; final national workshop presentations; interviews

Goal	Objectives	Sites	Activities	Results	Reach	Impact	Predicted outcomes	Realised outcomes	Means of assessment
							species for wide dissemination among communities	nurseries have been enhanced, to include bio-engineering species for wide dissemination among communities. In TIlahar, the nursery is run jointly by the women's group, DSCO, the school and roads committees. (See results for Objective 1)	
		ii.Tilahar in the Parbat district Bio-engineering along a 75 m stretch	• A dry wall was built to stabilize the most unstable slope	Slope stabilised			1. Three demonstration bio-engineering sites are established along road sides, demonstrating 'eco-safe' roads. Case studies are documented and disseminated.	1. Three demonstration bio-engineering sites have been established along road sides, demonstrating 'eco-safe' roads. Case studies have been documented and disseminated. (See results for Objectives 2,4 and 6)	Direct on-site observation of two of the three, EPIC, 2016 IUCN, 2016; final national workshop presentations; interviews
			• Some smaller stabilization measures were undertaken such as fixing bamboo rods onto the upslope part of the road and planting broom grass	Stabilisation measures work.					
			• Installed jute netting on the upper side of the road and apply fertilizer to strengthen plant growth.	Because of the steepness of the slope and soil type, several attempts were made to grow plants. Finally, jute netting has been installed. Too early					EPIC, 2016 IUCN, 2016; final national workshop presentations; interviews

Goal	Objectives	Sites	Activities	Results	Reach	Impact	Predicted outcomes	Realised outcomes	Means of assessment
				for results.					
			• Established a rhizotorn to experiment with plant adaptation in relation to climate change.	Rhizotorn established and growing well. Nearly 20,000 seedlings were planted in the three demonstration sites					Direct on-site observation; EPIC, 2016 IUCN, 2016; final national workshop presentations; interviews
			• Nursery established and is managed by the women's group in collaboration with DSCO, the school and roads committees, which distributed plants.	Capacity in Oct 2016 is 30,000 seedlings.			2.Three District Soil and Water Conservation/ community-based nurseries are enhanced, to include bio-engineering species for wide dissemination among communities.	2. Two District Soil and Water Conservation/ community-based nurseries have been enhanced, to include bio-engineering species for wide dissemination among communities. In TIlahar, the nursery is run jointly by the women's group, DSCO and the school and roads committees. (See results for Objective 1)	EPIC, 2016 IUCN, 2016; final national workshop presentations; interviews
		iii. Bhatkhola in Sjangya district	• Construction of a culvert along medium road to control drainage	This has controlled the drainage but reduced water for agriculture downslope. However, the community has not been able to come to a consensus about what should be done to resolve this.			1. Three demonstration bio-engineering sites are established along road sides, demonstrating 'eco-safe' roads. Case studies are documented and disseminated.	1. Three demonstration bio-engineering sites have been established along road sides, demonstrating 'eco-safe' roads. Case	Direct on-site observation; EPIC, 2016 IUCN, 2016; final national workshop presentations; interviews

Goal	Objectives	Sites	Activities	Results	Reach	Impact	Predicted outcomes	Realised outcomes	Means of assessment
			• Construction of two dry support walls to prevent runoff from the medium road towards the gullies formations	Has controlled runoff.				studies have been documented and disseminated. (See results for Objectives 2,4 and 6)	Direct on-site observation; EPIC, 2016 IUCN, 2016; final national workshop presentations; interviews
			• Construction of a live fence running along the medium road to avoid human and animal passage in the area	Has prevented animal passage and the downslope is now verdant.					Direct on-site observation; EPIC, 2016 IUCN, 2016; final national workshop presentations; interviews
			• Plantation of bamboo-type vegetation in gully formations	Growing well.					Direct on-site observation; EPIC, 2016 IUCN, 2016; final national workshop presentations; interviews; interviews
			• Plantation of fruit and fodder trees in some parts of the area	The community now sells broom grass and receives an income. A joint bank account has been opened, so that these funds may be used to maintain the bio-engineering works.					Direct on-site observation; EPIC, 2016 IUCN, 2016; final national workshop presentations; interviews
			• Establishment of a rhizotorn to experiment with plant adaptation in relation to climate change	Rhizotorn established and growing well. Nearly 20,000 seedlings were planted in the three demonstration sites					Direct on-site observation; EPIC, 2016 IUCN, 2016; final national workshop presentations; interviews
			• Nursery established and is managed by the DSCO which distributed plants.	Capacity in Oct 2016: 35,000 different bio-engineering seedlings produced			2.Three District Soil and Water Conservation/ community-based nurseries are	2. Two District Soil and Water Conservation/ community-	PIC, 2016 IUCN, 2016; final national workshop presentations;

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Goal	Objectives	Sites	Activities	Results	Reach	Impact	Predicted outcomes	Realised outcomes	Means of assessment
				in Syangja			enhanced, to include bio-engineering species for wide dissemination among communities.	based nurseries have been enhanced, to include bio-engineering species for wide dissemination among communities. In TIlahar, the nursery is run jointly by the women's group, DSCO and the school and roads committees. (See results for Objective 1)	interviews
	2. Build capacity of local and national actors (development, environment and DRR actors) through workshops, trainings and visits	i. Community training			About 444 have benefited from training.	All three communities are now fully engaged and are planning to seek funding from VDCs to maintain/ expand the bioengineering sites.	3.Community awareness is raised through the involvement of communities in bio-engineering establishment and maintenance.	3.Community awareness has been raised through the involvement of communities in bio-engineering establishment and maintenance. (See results for Objectives 1 and 2.) Participation of communities is ranked as Gharelu> Bhatkhola> Tilahar. The Mothers' group in Tilahar did not get off the	Trip reports/ field report; work plans
		Gharelu in the Sarangkot district	• Focus group discussions	16 held, 145 attended					Trip reports/ field report; work plans
			• Meetings	10 held, 115 attended					Trip reports/ field report; work plans
			• Discussions	4 held, 80 attended					Trip reports/ field report; work plans
		ii.Tilahar in the Parbat district	• Focus group discussions	16 held, 144 attended					Trip reports/ field report; work plans
			• Meetings	10 held,100 attended					Trip reports/ field report; work plans
			• Discussions	4 held, 80 attended					Trip reports/ field report; work plans
		Bhatkhola in the Sjangya district	• Focus group discussions	17 held, 155 attended					Trip reports/ field report; work plans
			• Meetings	12 held, 112 attended					Trip reports/ field report; work

Goal	Objectives	Sites	Activities	Results	Reach	Impact	Predicted outcomes	Realised outcomes	Means of assessment
								ground. They wanted to establish a nursery, but could not get the community to agree on what was needed, so it was not established. Women were involved in training but not planting.	plans
			• Discussions	3 held, 65 attended					Trip reports/ field report; work plans
		Gharelu	• Joint bioengineering training workshop	21 attended			4. Capacity building for local authorities, communities and several Nepali PhD and Masters students on bio-engineering techniques for road construction through workshops, educational materials and research.		Trip reports/ field report; work plans
		Tilahar	• Joint bioengineering training workshop	19 attended					Trip reports/ field report; work plans
		Bhatkhola	• Joint bioengineering training workshop	26 attended				4. Capacity building has been carried out for local authorities, communities (See results under Objective 2) and several Nepali PhD and Masters students on bio-engineering techniques for road construction through workshops, educational materials and research (See results under objective 3).	Trip reports/ field report; work plans
		ii. National/regional level workshops	• Consultation workshop: 'Bio-engineering - Toward eco-safe roads in the Panchase region - Applying	40 local/district govt, officials, 2 national level govt. officials. 5 university personnel, 30 NGO/INGOs = total 77 attended	Over 200 benefitted in total.	Capacities have been strengthened on Eco-DRR. In Nepal, bioengineering is already			Trip reports/ field report; workshop reports; work plans

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Goal	Objectives	Sites	Activities	Results	Reach	Impact	Predicted outcomes	Realised outcomes	Means of assessment
			Ecosystem-based Disaster Risk Reduction'			included on policy agenda, capacities have been built to show how bio-engineering can be implemented at local level and how effective it was for coping with landslides risk. This has been effected through the organisation of workshops and field visits to demonstration sites to demonstrate that eco-DRR is a relevant and cost-effective approach to deal with natural hazards.			
			• National Workshop on Ecosystems for Enhancing Resilience to Disaster and Climate Risks	15 national level govt. officials, 7 university personnel, 28 NGOs /INGOs = total 50 attended					Trip reports/ field report; workshop reports; work plans
			• Regional Workshop on Ecosystems for Enhancing Resilience to Disaster and Climate Risks	21 local/district govt officials, 13 national level govt. officials, 8 university personnel, 28 NGOs/INGOs = total 70l attended.					Trip reports/ field report; workshop reports; work plans
			• National Workshop on Eco-Safe Roads for Improving Community Resilience	27 local/district officials, 18 national level govt. officials, 12 university personnel, 52 NGOs/INGOs = 109 in total attended					Trip reports/ field report; workshop reports; work plans
			• Workshop on Ecosystems Protecting infrastructure and Communities	20 NGOs attended					Trip reports/ field report; workshop reports; work plans
		iii.Visits to demonstration sites	• IUCN Members	12 members visited in 2016	63 visitors in total				Trip reports/ field report; workshop reports; work plans
			• Nepal Agriculture Cooperative Central Federation Limited (NACCFL) members and local cooperative members	5 visited in 2016					Trip reports/ field report; workshop reports; work plans

Goal	Objectives	Sites	Activities	Results	Reach	Impact	Predicted outcomes	Realised outcomes	Means of assessment
			• District level stakeholders: other DSCOs	5 visited in 2015					Trip reports/ field report; workshop reports; work plans
			• Policy makers from seven different ministries	15 visited in 2015					Trip reports/ field report; workshop reports; work plans
			• Forest policy implementation working group from the Ministry of Forests and Soil Conservation	5 visited in 2015					Trip reports/ field report; workshop reports; work plans
			• Journalists	20 visited in total in 2014, 2015 and 2016					Trip reports/ field report; workshop reports; work plans
		iv. Publication of a brochure on bio-engineering in English and Nepali language	• Distributed at each training/national workshop	500 copies of English version and 700 copies of Nepali version distributed so far.	A total of 1200 copies distributed so far.				Trip reports/ field report; workshop reports; work plans
	3. Use scientific and local knowledge to enhance ecosystem resilient communities	Activities in all three sites	• VCA: HH survey, participatory community risk maps and bio-engineering maps	Completed	Altogether about 444 community members have benefited in total in all three sites.	All three communities are now fully engaged and are planning to seek funding from VDCs to maintain/ expand the bioengineering sites.	6.Research on low-cost and community based bio-engineering techniques and community resilience in relation to ecosystem services and disaster risk reduction is published.	6. Excellent research has been conducted *inter alia*, showing reduction in erosion after bio-engineering interventions, providing information on the best species for use in bio-engineering; actual climate changes are being quantified; at	Trip reports/ field report; workshop reports; work plans; IUCN, UNIL and ProAct (2013a literature survey; IUCN, UNIL and ProAct (2013b).
			• Lidar scanning: quantification of soil losses	Completed: In Tilahar, after bio-engineering interventions were undertaken, there was a 95% reduction in erosion at the site		Clear scientific evidence showing a reduction in erosion after bioengineering interventions, which can			Trip reports/ field report; workshop reports; work plans; IUCN, UNIL and ProAct (2013a literature survey; IUCN, UNIL and ProAct (2013b).;

Goal	Objectives	Sites	Activities	Results	Reach	Impact	Predicted outcomes	Realised outcomes	Means of assessment
						feed into national discussions.		least 8 scientific publications are in the pipeline.	workshop presentations; interviews; policy brief
			• Climate variables (e.g. Precipitation and Temperature) are being analysed applying spatial statistics to detect any changes: developing intensity duration frequency model of rainfall data	Intermediate results: number of wet days is decreasing; annual rainfall is more or less the same but there is increased intensity	These results will have a national reach	Indications of exactly what is happening in relation to climate change, this can feed into national discussions.			Trip reports/ field report; workshop reports; work plans; IUCN, UNIL and ProAct (2013a literature survey; IUCN, UNIL and ProAct (2013b).; workshop presentations; interviews
			• Stability Index Mapping (SINMAP): deterministic slope stability model – to assess the instability conditions and to establish a landslide susceptibility zonation	Not yet complete. Road induced shallow landslides and natural landslides will be explored from field assessments in terms of mechanism, size, materials and causes		No results yet, but can feed into national discussions			Trip reports/ field report; workshop reports; work plans; IUCN, UNIL and ProAct (2013a literature survey; IUCN, UNIL and ProAct (2013b).; workshop presentations; interviews
			• Setting up a weather station	Three weather stations established and monitored by each community and data collected by a PhD student	Altogether about 444 community members have benefited in total in all three sites.	Communities are now cognizant of weather changes in their localities. Enhanced knowledge.			Trip reports/ field report; workshop reports; work plans; literature survey; IUCN, UNIL and ProAct (2013b). vulnerability analysis report; workshop presentations
			• Land use trends 1979-2016 in Phewa	174 landslides were mapped after one single rainfall event	These results will have a national	Increased scientific knowledge			Trip reports/ field report; workshop reports; work

Goal	Objectives	Sites	Activities	Results	Reach	Impact	Predicted outcomes	Realised outcomes	Means of assessment
			Watershed	in July 2015, compared to 14 landslides before the event. Also, documenting the shift of erosion from agriculture to road construction in the watershed.	reach.	that can feed into national discussions. Enhanced knowledge.			plans; IUCN, UNIL and ProAct (2013a literature survey; IUCN, UNIL and ProAct (2013b).; workshop presentations; interviews., IUCN and UNIL 2016
			• Quantifying and demonstrating the problem and quantifying and demonstrating the solution in the Phewa watershed	Quantifying soil erosion and land use trends in Phewe watershed, so far recorded 179 erosion events along 129 km of roads surveyed (of 340 km) of roads in Phewa watershed.		Increased science knowledge that can feed into national discussions. Enhanced knowledge.			Trip reports/ field report; workshop reports; work plans; IUCN, UNIL and ProAct (2013a literature survey; IUCN, UNIL and ProAct (2013b).; workshop presentations; interviews., IUCN and UNIL 2016
			• Carrying out an economic cost-benefit analysis. Comparison between eco-safe roads and grey roads	Preliminary results: In a 'normal' monsoon scenario 'eco-safe' roads become more cost effective after 12 years as repair costs are significantly lower. For a higher than normal monsoon scenario, the cost of grey roads may be significantly higher than eco-safe roads		Clear economic evidence supporting the 'case' for eco-safe' roads. Enhanced knowledge.			Trip reports/ field report; workshop reports; work plans; IUCN, UNIL and ProAct (2013a literature survey; IUCN, UNIL and ProAct (2013b).; workshop presentations; interviews., IUCN and UNIL 2016
			• Survey paper in a special edition of (name) on bio-engineering.	In preparation.					Trip reports/ field report; workshop reports; work plans; IUCN, UNIL and ProAct (2013a literature survey; IUCN, UNIL and ProAct

Goal	Objectives	Sites	Activities	Results	Reach	Impact	Predicted outcomes	Realised outcomes	Means of assessment
									(2013b).; workshop presentations; interviews., IUCN and UNIL 2016
			• 2 PhD and 8 Master's degree students working on research in project sites	Master students completed the research and submitted the thesis, two PhD students are continuing their research		Enhanced capacity of Nepali nationals.			Trip reports/ field report; workshop reports; work plans; IUCN, UNIL and ProAct (2013a literature survey; IUCN, UNIL and ProAct (2013b).; workshop presentations; interviews., IUCN and UNIL 2016
	4. Conduct research on use of plant species (grass) for rural road slide slope protection under climate change	Activities in all three sites	• Plantation of several types of plants on the upper and lower road embankment			Improvement of supporting and provisioning services. Erosion has reduced, and communities are now harvesting grass for fodder.			Direct on-site observation in two of the three sites; trip reports/ field report; final national workshop presentations
			• Establishment of a rhyzotron to experiment with plant adaptation in relation to climate change.	Nearly 20,000 seedlings were planted in the three demonstration sites	These results will have a national reach.	Clear demonstration of practical benefits of bio-engineering.			Direct on-site observation in two of the three sites; trip reports/ field report; final national workshop presentations
			• Exploring the effectiveness of plant roots for soil bio-engineering: root biomass, tensile	Napier grass *(Pennisetum purpureum)* has the highest survival rate, and dense root architecture, but is weak in tensile		Enhanced knowledge on selection of best species for erosion control.			Workshop presentations; IUCN and UNIL, 2016

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Goal	Objectives	Sites	Activities	Results	Reach	Impact	Predicted outcomes	Realised outcomes	Means of assessment
			strength, survival: Examining the performance of vegetation in protecting shallow landslides; evaluating eco-engineering in roadsides towards resilience in mountain people	strength; Broom grass (*Thysanolaena maxima*) has the deepest roots, up to one metre below the soil; Salim khar (*Chrysopogon gryllus*) has the strongest roots.					
	5. Mainstream Ecosystem-based DRR into local, national and global policies	National level workshops	Consultation workshop: 'Bio-engineering -Toward eco-safe roads in Panchase region - Applying Ecosystem-based Disaster Risk Reduction'	77 in total attended.	Around 200 participated in national workshops.	Through various meetings and workshops held at local and national levels, EPIC effectively raised awareness on eco-DRR issues and approaches; through concrete examples from the pilot sites, policy makers were able to understand eco-DRR principles and to appreciate them as an alternative to hard infrastructure			Notes, workshop reports
			National Workshop on Ecosystems for Enhancing Resilience to Disaster and Climate Risks	50 in total attended.					Notes, workshop reports
			Regional Workshop on Ecosystems for Enhancing Resilience to Disaster and Climate Risks	70 in total attended.					Notes, workshop reports
			National Workshop on Eco-Safe Roads for Improving Community Resilience	109 in total attended					Notes, workshop reports
			Workshop on Ecosystems for Enhancing Resilience to Disaster and Climate	Discussion centred on which policy entry points for existing planning and policy processes could be			5.Ecosystem-based approaches are mainstreamed in targeted policies related to road	5. Attempts have been made to mainstream ecosystem-	Notes, workshop reports

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Goal	Objectives	Sites	Activities	Results	Reach	Impact	Predicted outcomes	Realised outcomes	Means of assessment
			Risks: Policy and Operational Considerations, April 21-24, 2015, Kathmandu and Pokhara	reviewed to incorporate Eco-DRR, challenges and opportunities, the stakeholders and potential next steps. 50 policy makers, practitioners, academia and journalists. Representatives from seven different ministries were present: including key ministries such as the National Planning Commission, the Ministry of Home Affairs, the Ministry of Forests and Soil Conservation, the Ministry of Infrastructure etc.			construction, land management (Integrated Watershed Management) and DRR at the national level.	based approaches in targeted policies related to road construction, land management (Integrated Watershed Management) and DRR at the national level. There is now an Environment Friendly Local Governance Framework (EFLGF), 2013 (aim is to make local development concept encouraging the environmental protection through local bodies) The fact that very high level government officials participated actively in the final EPIC workshop was very encouraging. The issue as discussed by most is actual implementation.	
			Ecosystems Protecting Infrastructure and Communities National Workshop on Eco-DRR for Improving Community Resilience	109 attended in total. The final workshop was attended by the Joint Secretary MoFSC, who stayed for several sessions and made valuable inputs. The DG DSCWM stayed for the whole workshop. The Joint Secretary of the National Planning Commission attended on the last day and joined the field trip.	109				Direct observation, presentations; interviews
			IUCN Nepal has been working with the Government of Nepal to include Eco-DRR in the National Nature	Concept of Eco-DRR included in strategic framework	National	Increase in knowledge of Eco-DRR			Notes; interviews

Goal	Objectives	Sites	Activities	Results	Reach	Impact	Predicted outcomes	Realised outcomes	Means of assessment
			Conservation Strategy Framework for Sustainable Development topic.						
			IUCN Nepal is an active part of the Nepal Risk Reduction Consortium and the many post-earthquake coordination meetings, providing inputs	Inputs provided to Nepal Risk Reduction Consortium	Different national and international organisations	Disseminated the Eco-DRR knowledge			
			IUCN Nepal serves on a high-level committee on EbA injecting EPIC into discussions	EbA technical committee know about the EPIC project and Eco-DRR work	National level policy makers	Disseminated knowledge on Eco-DRR; national level policy makers have understood the importance			Notes; interviews
			Policy brief	Developed and disseminated at final EPIC workshop.	120 distributed				Notes; interviews
	6. Inter-country learning and sharing of knowledge among the EPIC countries (and dissemination within and without Nepal)	i. Inter-country learning and dissemination	Subtopic Slope stability conference, Hong Kong, 2014	Poster presented: Shrubs and grasses in building eco-safe roads	International	EPIC knowledge is disseminated			IUCN Nepal communications inventory
			European Geographical Union Conference, 2015	Poster: Unplanned roads impacts assessment in Phewa Tal watershed, Western region, Nepal Geophysical Research Abstracts	International scientists				IUCN Nepal communications inventory
			Regional Conservation Forum, Bangkok, 2014	Presentation: EPIC, implementing ecosystem-based DRR	IUCN members from Nepal and other countries and other participants				IUCN Nepal communications inventory
			ISPRS-FIG Scientific	Abstract: Investing in	International				IUCN Nepal

Goal	Objectives	Sites	Activities	Results	Reach	Impact	Predicted outcomes	Realised outcomes	Means of assessment
			conference, 2015	Ecosystem Approaches for more Resilient Disaster Risk Reduction					communications inventory
			UNISDR/ STAG conference, Geneva and Bonn PEDRR workshop	Quantifying ecosystem services for disaster risk reduction – research from the EPIC project	International				IUCN Nepal communications inventory
			World Parks Congress November 2014	From Nepal two case studies were presented in two congress sessions	International				IUCN Nepal communications inventory
			World Conservation Congress, Hawaii, 2016						IUCN Nepal communications inventory
		ii. Within country learning and dissemination	Magazine article in Face to Face	Panchase adapting to climate change		Heightened public awareness about eco-safe roads.			IUCN Nepal communications inventory
			Articles/press releases in Nepalese newspapers	7 articles published: 'Bioengineering gains popularity' in English and Nepali; 'Stakeholders stress in eco-safe roads' in national English newspaper; 'Bioengineering an effective method for controlling soil erosion' in national Nepali newspaper; 'Community participation in bioengineering' in local newspaper, Op-ed on landslide in national English newspaper, etc.	This had a local and national reach				IUCN Nepal communications inventory
			Video on the EPIC project	Telecast on national TV					IUCN Nepal communications inventory
	Establish a multi-						A multi-stakeholder	Achieved.	

Goal	Objectives	Sites	Activities	Results	Reach	Impact	Predicted outcomes	Realised outcomes	Means of assessment
	stakeholder dialogue platform, comprised of government, NGOs, civil society uses and promotes nationally and provide input to the findings of the project.						dialogue platform, comprised of government, NGOs, civil society established that uses and promotes nationally and provide input to the findings of the project.	See organigramme in Figure 22, but lacks true range of stakeholders, such as the private sector.	

11. Annex 11: Logical Framework for EPIC Senegal

Goal	Objectives	Sites	Activities	Results	Reach	Impact	Predicted outcomes	Realised outcomes	Means of assessment
Strengthening local strategies for adaptation to climate change	1. **Assessing the risks and effects of climate change on poor communities**	Six villages in the commune of Djilor in the Fatick Region. Site selection based on a) vulnerability to climate change; b) richness of biodiversity; c) commitment of communities and local authorities 4) the presence of IUCN Senegal. 1. Djilor 2. Gagué Cherif 3. Goundême Sidy 10.Kamatane Bambara Péthie 4. Sadioga	Analysis of the socio-economic and biophysical reference situation of the rural community (ecosystem mapping)	Baseline for EPIC Senegal report completed			1. The effects of climate change and associated strategies assessed and documented.	Achieved Achieved	IUCN and ProAct, 2013a IUCN, 2013
		All villages	State of play and analysis of agricultural, livestock and fisheries adaptation techniques to the risks of natural disasters linked to climate change in the commune of Djilor, Senegal	Report completed by ISTOM					ISTOM TERRA (2015a). in Dropbox

Goal	Objectives	Sites	Activities	Results	Reach	Impact	Predicted outcomes	Realised outcomes	Means of assessment
		All villages	Evaluation of the risks of natural disasters and study of adapted practices for the preservation of local resources (Commune of Djilor, Senegal)	Report completed by ISTOM					ISTOM TERRA undated in Dropbox
		All villages	Report on mapping disaster risk	Report completed by ISTOM					ISTOM TERRA 2015b in Dropbox
		All villages	Report on the status of saline soils	Report completed by ISTOM					Mbaye, 2014b in Dropbox
		All villages	Report of the assessment of the potential of assisted natural regeneration (ANR)	Report completed by ISTOM					Mbaye, 2014a in Dropbox
		All villages	A vulnerability and capacity assessment workshop was held from 15 to 19 July 2013 in Djilor. This meeting highlighted the main risk or vulnerability factors related to changes in the internal and external environment of the rural community of Djilor. In addition to identifying vulnerabilities, the methodology Promoting Local Innovations (PLI) for Community-Based Climate Change Adaptation in Coastal Areas was used to elicit identification of not only problems but also solutions.	Innovations identified by communities For 1. **Djilor**: a) Rehabilitation of natural outfalls for rainwater run-off and restoration of ecosystems (recharge of the groundwater, leaching of salt lands, regulation of the hydrological system in the mangrove); b) Improvement of soil fertilisation and control of termites by the reforestation of *Jatropha* (medicinal plant)	18 community members (3 per village) and 8 technical service officers. With the participation of the decentralised regional heads of Fatick in charge of environment, agriculture, fisheries, hydraulics and planning, as well as the head of the Centre for Local Development Support (CADL).				IUCN and ProAct, 2013b

Goal	Objectives	Sites	Activities	Results	Reach	Impact	Predicted outcomes	Realised outcomes	Means of assessment
				2. **Gagué Cherif**: Process for setting up a regulatory mechanism for the exploitation of forest and fisheries resources for sustainable management (increase in regulatory size) (convention/ charter) 3. **Goundême Sidy**: a) Reforestation of eucalyptus to control the salinization of agricultural land; b) Development of ponds for livestock watering; c) Use of ANR to conserve forest resources 4. Kamatane Bambara: a). *Eucalyptus* and *Prosopis* for forestry and b) stockage of seeds and cereals 5. Péthie: a) Seasonal protection to regenerate the vegetation cover (successful restoration / appropriation / membership of					

Goal	Objectives	Sites	Activities	Results	Reach	Impact	Predicted outcomes	Realised outcomes	Means of assessment
				breeders) -; b) Erection of anti-salt bunds with local materials (fassine / braiding) 6. Sadioga: a) Construction of a dam to protect the pond; b) Use of sandbags to combat water erosion and gullying					
		All villages	Two inter-village management committees have also been set up. Their mission is to coordinate activities related to NAS and soil reclamation techniques. These activities coordinating committees will also ensure the monitoring and maintenance of nurseries (watering). The inter village management committee is mixed and consists of representatives of the villages.						Annual Report 2014

Goal	Objectives	Sites	Activities	Results	Reach	Impact	Predicted outcomes	Realised outcomes	Means of assessment
		All villages	3 innovations prioritised: 1. Use of Assisted Natural Regeneration (ANR) for the conservation of forest resources (forest ecosystem) 2. Construction of anti-salt bunds with local materials (marine and coastal ecosystem) 3. Establishment of a mechanism to regulate the exploitation of natural resources for sustainable management (resource governance).	1 and 2 detailed under each village below. 3. Discussions with local communities held for the formulation of a local convention and convention (charter) has been formulated and been validated by the national committee. Pending approval and validation from the municipality so that it can be enforced.	When enforced, it will affect the whole of the commune of Djilor. 28,606 in 54 villages and 8 hamlets. Proposed consultation to be held in July-August 2017		2. Best demonstrated adaptation strategies and stakeholder awareness of these enhanced	Achieved	IUCN and ProAct, 2013a
		Djilor	ANR	700 seedlings grown in nursery,300 planted, 58 trees growing in the land after intervention. Extent of current productive land=31.5 ha	Directly, the households of the practitioners= 71, indirectly, the whole community=3157				Annual reports 2014, 2015, and 2016, also information received from Project manager
			Diguettes (anti-salt bunds)	14 diguettes established	Whole community 3,157				IUCN and ProAct, 2013a
			Other	20 Blue Holland roosters introduced, 5 died, now have 23 mixed breed birds	Indirectly, whole community 3,157, but directly women= 442				Annual reports 2014, 2015, and 2016, also information received from Project manager
			Capacity building	Strengthen the capacities of management committees in organisational dynamics, and	Village Development Committee= 17				IUCN, 2014

Goal	Objectives	Sites	Activities	Results	Reach	Impact	Predicted outcomes	Realised outcomes	Means of assessment
				project monitoring					
				Two training sessions: The sessions covered 3 modules (ANR, halophytes for nurseries; recovery of salinized soils) were presented and followed by a practical hands-on learning session on the ground for the various themes covered.	About 90 people representing different actors participated in the sessions: six villages the Rural; Council, grassroots organisations (women's groups, youth groups, farmers, fishermen and farmers), technical services (Water and Forests Department, Regional Division for the Environment and Classified Establishments, Centre for Support to Local Development in Djilor).				IUCN, 2014 Annual reports, additional information obtained from Project manager
		Gagué Cherif	ANR		Directly, the households of the practitioners= 97, indirectly, the whole community=985				IUCN, 2014 Annual reports, additional information obtained from Project manager
			Diguettes (anti-salt bunds)	12 diguettes established	Whole community 985				IUCN, 2014 Annual reports, additional information obtained from Project manager
			Other	20 Blue Holland roosters introduced, 10 died, now have 30 mixed breed birds	Indirectly, whole community 985, but directly women= 266				
			Capacity building	Strengthen the capacities of	Village Development				IUCN, 2014 Annual reports,

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Goal	Objectives	Sites	Activities	Results	Reach	Impact	Predicted outcomes	Realised outcomes	Means of assessment
				management committees in organisational dynamics, and project monitoring	Committee= 12				additional information obtained from Project manager
				Two training sessions: The sessions covered 3 modules (ANR, halophytes for nurseries; recovery of salinized soils) were presented and followed by a practical hands-on learning session on the ground for the various themes covered.	About 90 people representing different actors participated in the sessions: six villages the Rural; Council, grassroots organisations (women's groups, youth groups, farmers, fishermen and farmers), technical services (Water and Forests Department, Regional Division for the Environment and Classified Establishments, Centre for Support to Local Development in Djilor).				IUCN, 2014 Annual reports, additional information obtained from Project manager
		Goundéme Sidy	ANR	570 seedlings grown in nursery,430 planted, 198 trees growing in the land after intervention. Extent of current productive land=85.5 ha	Directly, the households of the practitioners= 71, indirectly, the whole community=3157				IUCN, 2014 Annual reports, additional information obtained from Project manager
			Diguettes (anti-salt bunds)	8 diguettes established	Whole community 864				IUCN, 2014 Annual reports, additional information obtained from Project manager

Goal	Objectives	Sites	Activities	Results	Reach	Impact	Predicted outcomes	Realised outcomes	Means of assessment
			Other	20 Blue Holland roosters introduced, 18 died, now have 12 mixed breed birds	Indirectly, whole community 864, but directly women= 207				IUCN, 2014 Annual reports, additional information obtained from Project manager
				Vegetable gardening set up in Sadioga and Kamatane Mbambara	Indirectly, whole community 864, but directly women= 207				IUCN, 2014 Annual reports, additional information obtained from Project manager
			Capacity building	Strengthen the capacities of management committees in organisational dynamics, and project monitoring	Village Development Committee= 11				IUCN, 2014 Annual reports, additional information obtained from Project manager
		Kamatane Bambara	ANR	86	Directly, the households of the practitioners= 71, indirectly, the whole community=277				IUCN, 2014 Annual reports, additional information obtained from Project manager
			Diguettes (anti-salt bunds	11 diguettes established	Whole community 277				IUCN, 2014 Annual reports, additional information obtained from Project manager
			Other	19 Blue Holland roosters introduced, 16 died, now have 12 mixed breed birds	Indirectly, whole community 277, but directly women=89				IUCN, 2014 Annual reports, additional information obtained from Project manager
				Establishment of a protected forest	Extent 100m^2				IUCN, 2014 Annual reports, additional information obtained from Project manager
			Capacity building	Strengthen the capacities of	Village Development				IUCN, 2014 Annual reports,

Goal	Objectives	Sites	Activities	Results	Reach	Impact	Predicted outcomes	Realised outcomes	Means of assessment
				management committees in organisational dynamics, and project monitoring	Committee= 13				additional information obtained from Project manager
		Péthie	ANR	950 seedlings grown in nursery,850 planted, 208 trees growing in the land after intervention. Extent of current productive land=62 ha	Directly, the households of the practitioners= 79, indirectly, the whole community=427				IUCN, 2014 Annual reports, additional information obtained from Project manager
			Diguettes (anti-salt bunds	20 diguettes established	Whole community 427				IUCN, 2014 Annual reports, additional information obtained from Project manager
			Other	20 Blue Holland roosters introduced, 2 died, now have 87 mixed breed birds	Indirectly, whole community 427, but directly women=102				IUCN, 2014 Annual reports, additional information obtained from Project manager
				Establishment of a protected forest	Extent 300 ha				IUCN, 2014 Annual reports, additional information obtained from Project manager
			Capacity building	Strengthen the capacities of management committees in organisational dynamics, and project monitoring	Village Development Committee= 11				IUCN, 2014 Annual reports, additional information obtained from Project manager
									IUCN, 2014 Annual reports, additional information obtained from Project manager
		Sadioga	ANR	542 seedlings	Directly, the				IUCN, 2014

Goal	Objectives	Sites	Activities	Results	Reach	Impact	Predicted outcomes	Realised outcomes	Means of assessment
				grown in nursery,400 planted, 164 trees growing in the land after intervention. Extent of current productive land=79 ha	households of the practitioners= 135, indirectly, the whole community=1005				Annual reports, additional information obtained from Project manager
			Diguettes (anti-salt bunds	30 diguettes established	Whole community 1005				IUCN, 2014 Annual reports, additional information obtained from Project manager
			Other	20 Blue Holland roosters introduced, 17 died, now have 53 mixed breed birds	Indirectly, whole community 1005, but directly women=317				IUCN, 2014 Annual reports, additional information obtained from Project manager
				Establishment of a protected forest. Extent 100 m^2	Should benefit the whole village				IUCN, 2014 Annual reports, additional information obtained from Project manager
			Capacity building	Strengthen the capacities of management committees in organisational dynamics, and project monitoring	Village Development Committee= 18				IUCN, 2014 Annual reports, additional information obtained from Project manager
	2.	All villages	Collation of activities	Report completed and presented in Feb 2017 to Commission of Prevention and Disaster Risk Management and Humanitarian Affairs (COMNACC))	How many people attended = 25				IUCN, 2014 Annual reports, additional information obtained from Project manager
	3. Demonstration of the economic benefits of		Not achieved.						Annual report 2016

Goal	Objectives	Sites	Activities	Results	Reach	Impact	Predicted outcomes	Realised outcomes	Means of assessment
	Ecosystem Based Adaptation (EbA) strategies								
	Other capacity building			Two training sessions: The sessions covered 3 modules (ANR, halophytes for nurseries; recovery of salinized soils) were presented and followed by a practical hands-on learning session on the ground for the various themes covered.	About 90 people representing different actors participated in the sessions: six villages the Rural; Council, grassroots organisations (women's groups, youth groups, farmers, fishermen and farmers), technical services (Water and Forests Department, Regional Division for the Environment and Classified Establishments, Centre for Support to Local Development in Djilor).		Stakeholders informed about climate change adaptation mainstreaming tools, approaches and dialogues, for its integration into local, national and regional frameworks	Achieved but not adequate at national level	IUCN 2014 b
				Training workshop on Eco-DRR	Attended by 40 stakeholders involved in risk management, including local decision-makers, central government departments (environment, agriculture, fisheries, meteorology, town planning), civil society,				IUCN 2014 b

Goal	Objectives	Sites	Activities	Results	Reach	Impact	Predicted outcomes	Realised outcomes	Means of assessment
					NGOs, international institutions and projects and programs in the field of climate change.				
	Policy influence	Local/ Regional/ National	Establishment of a commission (Commission of Prevention and Disaster Risk Management and Humanitarian Affairs) in charge of prevention and disaster risk management in the department of Foundiougne (COMNACC)	A plan of action has been developed (2017) and validated by stakeholders. This plan will be submitted to the partners for its operationalisation	Local		Tailored policy message	Achieved only at local level	Annual Report 2016
				Training on risk management tools based on ecosystems (May 2017), to Strengthen risk management capabilities of EbA	Not available				Annual Report 2016
			National Wetland Policy formulation (2015)	EbA has een included in the National Wetland Policy					Presentation made at the Global Workshop, June 2017.
			Support for the organisation of a round table of partners for the financing of the Action Plan of the Commission for prevention and management of risks of natural disasters and humanitarian affairs (to be done in Mar 2017)	Round table = 36	County Council Fatick, local				Annual Report 2016
			Organising an information workshop on the legal and institutional	40 many people expected	National Assembly, national				Annual Report 2016

Goal	Objectives	Sites	Activities	Results	Reach	Impact	Predicted outcomes	Realised outcomes	Means of assessment
			instruments to take better account of the ecosystem approach in risk management (to be done in Apr 2017)						
			Civil Protection Directorate Capacity building on the contribution of natural ecosystems in reducing disaster risk, Training and field visit on nature-based solutions to reduce disaster risks (to be done June 2017)	20 people expected	National				Annual Report 2016
			National Platform Risk Management: strengthening risk management capabilities of EbA, training on risk management tools based on ecosystems (to be done in July 2017)	20 people expected	National				Annual Report 2016
			African Association for the Promotion of Disaster Risk Reduction upgrading civil society approaches and risk management tools based on ecosystems; training on risk management tools based on ecosystems (to be held in August 2017)	20 people expected	National				Annual Report 2016
	Multi-stakeholder dialogue platform		IUCN has participated in several meetings organised on the theme of risk management based on ecosystems. This	Position papers presented.					

Goal	Objectives	Sites	Activities	Results	Reach	Impact	Predicted outcomes	Realised outcomes	Means of assessment
			is the preparatory meeting of the 6th meeting of the African regional platform and the 5th Meeting of High Level on reducing disaster risk						
			Policy brief	Will be completed in 2017	National				Annual Report 2016
	Learning dissemination	In country dissemination	Forum of Partnership for the conservation of marine and coastal environment in West Africa November 2013	Side event: Promoting local innovations, a sustainable solution to the risks of natural disasters	Local 60				Information provided by Project manager
			National Climate Change Committee: Workshop	EPIC: Healthy ecosystems can help reduce risks and make communities more resilient	30 people				Information provided by Project manager
			World Wetlands Day	Presentation: Preventing and managing natural disaster risks: what contribution do ecosystems make	200 people				Information provided by Project manager
			Webinar	Presentation: Addressing resource degradation to enhance climate change resilience	Global				Information provided by Project manager
			Exchange visit of from the commune of Kaffrine, co-organised with the Regional Program for Sustainable Land Management and	to study ANR and understand its benefits	40 people (local decision makers, technical services and producers) of the Municipality of Djilor				Information provided by Project manager

Goal	Objectives	Sites	Activities	Results	Reach	Impact	Predicted outcomes	Realised outcomes	Means of assessment
			Climate Change Adaptation in the Sahel (PRGDT)						
		Inter-country dissemination	Study tour of EPIC Senegal sites by practitioners from Burkina Faso	Meeting of exchange and sharing of experiences between producers in Burkina Faso and Senegal: The EPIC project in Senegal	30				EPIC 2016
			Seminar of French-speaking Mayors: countries of the south facing the challenges of climate change, The innovative example of the partnership between the Senegalese State and the cities	Impacts of salinization of land on the production systems of the commune of Djilor	300 people				Information provided by Project manager
			Video: Saving Senegal's soil	http://www.dw.com/en/saving-senegals-soil/av-18535319	Global				http://www.dw.com/en/saving-senegals-soil/av-18535319
			Video: Climate impact on Senegal	https://www.youtube.com/watch?v=rDMA9D-H6Ts&index=1&list=PL838472D4C13DF250	Global				https://www.youtube.com/watch?v=rDMA9D-
			World Conservation Congress Hawaii, 016	Various communication materials at side events	Global				Communication inventory of WCC events provided by EPIC programme officer
	A multi-stakeholder dialogue platform, comprising government, NGOs, civil society						A multi-stakeholder dialogue platform, comprising government, NGOs, civil society established and provides input to the	Achieved but in tandem with local policy influence, therefore, for example, lacks private sector	Annual reports

Goal	Objectives	Sites	Activities	Results	Reach	Impact	Predicted outcomes	Realised outcomes	Means of assessment
	established and provides input to the findings of the project.						findings of the project.	representation See organigramme Figure 23	

12.   Annex 12: Logical Framework for EPIC Thailand

Goal	Objectives	Sites	Activities	Results	Reach	Impact	Predicted outcomes	Realised outcomes	Means of assessment
To use the Community Based Ecological Mangrove Restoration (CBEMR method) to restore abandoned aquaculture ponds to productive mangroves, which will aid coastal protection and support resource based livelihoods, especially fisheries.	1. To create an CBEMR demonstration site for future CBEMR trainings in Thailand and build awareness of the hydrological factors in restoring areas degraded by man-made changes to the hydrology	Site # 1 Bang Laem Pond, Baan Klong Kum Village (Moo 3), Thailand, Krabi Province, Muang District, Klong Prasong Sub-district, approximately 100 m from the Andaman coast Site # 2 Imam's Pond, Baan Koh Klang Village (Moo 1) Bang Laem Pond, Baan Klong Kum Village (Moo 3), Thailand, Krabi Province, Muang District, Klong Prasong Sub-district, approximately 350 m from the Andaman coast. Koh Klang has a population of 1,462,	Ecological survey in order to understand the hydrology, ecological conditions, plant and animal species etc.	Completed ecological conditions, existing vegetation mapped. Baseline verification completed and report produced	8 community members participated.	• Community and government officers' awareness related to CBEMR has increased, but is not 100% as some community members still believe that planting is necessary, not natural recruitment (Interviews). • Empirical evidence for CBEMR is restoring abandoned aquaculture ponds to productive mangroves is weak. One third of the interview-ees felt that there was insufficient empirical evidence (See Chapter on recommend-ations for more details).	1. Rehabilitation of 15 rai (2ha +) of mangrove using CBEMR.	1. The process of CBEMR was achieved but empirical evi-dence of resto-ration is poor (See Chapter on Recommen-dations).	Annual Reports 2014, 2015, 2016 in Dropbox IUCN and ProAct 2013a
			Study community history according to what has been done at the restoration area, natural conditions in the past, prior to the mangrove degradation/stress	In community vulnerability analysis.	23 community members participated				IUCN and ProAct 2013b, Raks Thai and MAP (undated) and list of signatures in Dropbox
			Having a community agreement on zoning such as where will be the CBEMR demonstration site and where is the community forest area	Completed. restoration plans drawn	23 community members participated				Restoration plans in Dropbox
			Plan and correct tidal hydrology and ensure good drainage	Complete data sheet of observation plus local community observation, of water level, salinity and temperature in 0+12 months 0+ 18 month	MAP personnel + 1 or 2 from community April 2015; Oct 2015; July 2016; Nov 2016				Monitoring sheets obtained from MAP
			Hand digging to finish water control gates. Sluice gates & wooden gates were replaced by cement culverts. EPIC Site #1	Site # 1: community= 64 villager person days; volunteers= 28 Project Abroad volunteer person days; MAP= 15				Direct on-site observation; interviews

Goal	Objectives	Sites	Activities	Results	Reach	Impact	Predicted outcomes	Realised outcomes	Means of assessment
				water controlled by covert and one PVC pipe; EPIC Site #2 backhoe installed PVC connection in Nov. due to high energy	MAP staff person days (people including a fishery expert and MAP volunteer). Site #2: Community: 30 villager person days (22 people); volunteers: 22 Project Abroad person days; 20 MAP staff person days (4 people including a fishery expert and MAP volunteer).				
			Repairing with a back hoe	Deep trenches for silvofishery established. I both sites, mud crabs are being harvested. However, this has not been quantified.	Only 2 households will benefit from silvo fisheries. The Imam (site # 2) gives one of the women's group fish and income from mud crabs that he catches from the sites.				Interviews; https://www.youtube.com/watch?v=8d5fgiXhbw4
			Planting tree seedlings only if necessary	Small-scale mangrove propagule or seedling planting, as needed, including collecting propagules from natural forest 184 seedlings planted	MAP personnel + 1 or 2 from community In Site # 1 where there is a bare patch.				Monitoring sheets obtained from MAP
			Building fence to protect restoration sites from goats in Site # 2	More concrete fence posts were required as wood decayed and the fence broke or blew over. Two	10 community members involved.				Direct observation was that a heavy storm had knocked over one side.

Goal	Objectives	Sites	Activities	Results	Reach	Impact	Predicted outcomes	Realised outcomes	Means of assessment
				strands barbed wire were added.					EPIC 2015 a and b Direct observation
			Monitoring restoration through a) time-lapse photographs at 0+3 months;0+6 months;0+12 months; 0+ 18 months;0+ 24 months b) 9 X 3 m^2 quadrats	Regeneration has been patchy. On both sites, there are bare patches on which nothing is growing.

Regeneration has been much lower than expected.

EPIC site#1 planting took place to increase the number of seedlings on muddy area due to low number of volunteer seedlings. | MAP personnel, April 2015; Oct 2015; July 2016; Nov 2016. | | | | |
| | 2. Empower and build capacity of local communities as central stakeholders in coastal resource management so that they become examples of agents of change in a bottom-up approach to neighbouring communities and hopefully leading | Same as above | Two CBEMR training workshops held whose objectives were a) To teach the principles and techniques on CBEMR to community members, local government staff and local stakeholder representatives; b) To encourage local communities and | Two training Workshops (2) held | A total of 57persons attending including trainers and support staff attended. The workshop participants were a mix of local community members, NGO staff from Raks Thai, and several government | | . 2. Trained personnel in using CBEMR and increased community capacity to sustainably manage their natural resources. | 2. The awareness about CBEMR is very good, but not 100% as some community members still believe that planting is necessary, not natural recruitment and three owners planned to | IUCN and ProAct 2013e |

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Goal	Objectives	Sites	Activities	Results	Reach	Impact	Predicted outcomes	Realised outcomes	Means of assessment
	to the establishment of a local community network		involved organisations to apply the principles of the CBEMR for restoring mangroves for sustainability of mangrove management and c) To share problems, experiences and solutions when restoring their own mangrove forests.		DMCR staff. It included two field trips to combine theory including a visit to the Lang Da Village CBEMR demonstration site and for practical field work, which is often the most effective way to disseminate information especially for community members. Participants put the CBEMR theory to test developing a restoration plan at four different pond sites on Klang Island.			increase silvoculture although it appears that outcomes of combining silvoculture and restoration has not been very successful i(Interviews).	
	3. To restore the biodiversity of mangrove habitat, which a number of community members depend on as a supplementary livelihood such as producing thatch for income and mud crab collection	Same as above.	Monitoring Silvo-fisheries component; Monitoring protocol developed including fishing gear used, type of aquatic animal, number harvested, weight, size, market price, price sold and income.	Monitoring started late because of the problems with the sluice gate. In both sites harvesting mud crabs in ongoing Catch data is available for mud crabs, but have not been collected systematically. No fish data have been collected.	Theoretically 2 households.

 In reality the Imam (site # 2) gives on of the women's group fish and income from mud crabs. Site # 1 there is still no harvest. | | 3. Creation of the model demonstration site for Community Based Ecological Mangrove Restoration which can be used to promote this technique through MFF and to the Department of Marine and Coastal Resources and mangrove restoration practitioners within and outside of Thailand. | 3. As above. | Interviews; https://www.youtube.com/watch?v=8d5fgiXhbw4 |

Goal	Objectives	Sites	Activities	Results	Reach	Impact	Predicted outcomes	Realised outcomes	Means of assessment
			Socioeconomic Assessment of the EPIC Mangrove Restoration Project in Thailand by students of the University of Massachusetts	Analyses of results was not presented in the report provided by the students		None. The report had no substance and the whole activity was dropped.			King and Cordero, 2015 Interviews
	4. To use a multi-stakeholder approach during the entire process involving government, local people, and NGOs	Same as above.	EPIC Advisory Committee established and meets quarterly	Committee established with agreed Terms of Reference at site/project implementation level 11-member committee local government, DMCR, community leaders, technical advisor / MAP Raks Thai, meets quarterly	6 meetings held so far, 70-80% attendance		4. Stakeholders are trained on ecosystem-based approaches to DRR and CCA – Community based ecological mangrove restoration	4. This outcome has been extremely successful. The established advisory committee comprised a range of stakeholders, including government officers, community representatives and NGOs, although, the meetings have not been as quarterly as planned. The signing of an MoU between IUCN Thailand and the DMCR has been ground breaking, and has been proposed that CBEMR will be demonstrated on government land by IUCN.	Annual Reports. Interviews.
			Inception workshop	Inception workshop held. Objectives were a a) To launch the EPIC project in Krabi by informing and building awareness of its goals amongst key stakeholders b) To exchange information on (DRR and Climate Change (CC) and the role EbA with stakeholders with the goal to support future networking, collaboration and	48 participants including MAP staff attended from MAP Asia, IUCN, ProAct Network, Krabi Provincial Administration Organization (PAO), Raks Thai (CARE Thailand), United Nations Development Program (UNDP), Department of Marine and Coastal Resources (DMCR),				IUCN and ProAct 2013d

Goal	Objectives	Sites	Activities	Results	Reach	Impact	Predicted outcomes	Realised outcomes	Means of assessment
				synergies; c) To introduce the CBEMR methodology as an alternative rehabilitation technique to planting mangrove plantations and d) Invite stakeholder participation and support for the project while encouraging information exchange and networking	Ministry of the Environment and Natural Resources (Krabi Provincial Office), GIZ, Projects Abroad international volunteers, an academic, a consultant, a teacher, community representatives from Kang Khao, Leam Makam villages in Trang province and from Klang Island and Klong Yang village, Krabi province.			This will indubitably lead to its acceptance into policy.	
	5. To develop and deliver tailored policy messages for target government agencies	Same as a above	Influencing policy on DRR and mangrove restoration	Policy brief formulated and disseminated	National		Tailored policy message		Policy brief. brief
	6. To establish a stakeholder dialogue platform, comprised of government, NGOs, civil society established in Thailand, which will use and promote nationally and provide input to the findings of the project	Same as a above	Establishing a Marine and Coastal working group	Carried out by IUCN in 2014 IUCN played a role in the development and subsequent adoption of the Coastal Zone Management Act in Thailand. Served to review the MCR Act and provide inputs during its formulation. Has met twice and will meet again for a final EPIC workshop	National	About 11 people, met twice, but mainly networking by email.			

Goal	Objectives	Sites	Activities	Results	Reach	Impact	Predicted outcomes	Realised outcomes	Means of assessment
			Establishing a direct relationship with the DMCR	Signing of an MoU between IUCN Thailand and the DMCR valid for 5 years from 2016	National	Application of EPIC learning framework to project outcomes and integration of EPIC framework used related stakeholders; DMCR has a site which needs restoration and has requested that IUCN carries out this exercise; Last year's Marine and Coastal Resources Act includes clauses for community participation; Through the establishment of a demonstration site, it is hoped that the CBEMR concept will be accepted eventually by the			Annual reports.

Goal	Objectives	Sites	Activities	Results	Reach	Impact	Predicted outcomes	Realised outcomes	Means of assessment
						government; This leads to integration of the community into planning and implementa-tion of mangrove restoration			
	In- and inter-country learning and sharing of knowledge among the EPIC countries	In-country learning and dissemination presentations	Regional conference in Bangkok Jan.23-24, 2014 "Community based climate change adaptation: Practical experiences from coastal South East Asia" CARE Deutschland–Luxemburg e.V. and Raks Thai Foundation	Presentation given on Community-based Climate Adaptation: EPIC	About 60 people attended the conference			Dissemination of CBEMR within the country has been excellent.	Communications inventory in Dropbox. Correspondence with implementing partners/IUCN
			Carbon Stock Assessment and Emissions Inventory in Asian Mangroves: Executive Summary for Policy Makers held in Bangkok on April 24-25, 2013.	Presentation given EPIC case study	About 60 people listened to the presentation				Communications inventory in Dropbox. Correspondence with implementing partners/IUCN
			SEAMEO Youth Leadership Forum Mar 2014 Bangkok	Presentation on Mangrove Conservation Education	A total about 50 including 33 youth participants from ASEAN +3				Communications inventory in Dropbox. Correspondence with implementing partners/IUCN

Goal	Objectives	Sites	Activities	Results	Reach	Impact	Predicted outcomes	Realised outcomes	Means of assessment
			' Workshop on 'The role of the community/ citizen scientists in tidal wetland restoration. Thailand	Presentation, a case studies and small group discussions and plenary discussion.	40 People were representing academic, researcher, students and civil society				Communications inventory in Dropbox. Correspondence with implementing partners/IUCN
			Improved Management of Extreme Events through Ecosystem-based Adaption in Watersheds — ECOSWaat	Community-based Ecological Mangrove Restoration: successes challenges and lessons learned	Seven staff members from the GIZ – ECOSWaat project				Communications inventory in Dropbox. Correspondence with implementing partners/IUCN
			Conference Department of Marine and Coastal Resource (DMCR) and IUCN conference on June 11, 2015 with: Thai DMCR policy planning and implementing officers	Presentation on CBEMR and mangrove polyculture	11 DMCR officers				Communications inventory in Dropbox. Correspondence with implementing partners/IUCN
			Joint initiative between DMCR and IUCN at government's pilot project at Nakon Si Thammarat (Mangrove restoration and Organic Mangrove polyculture).	Presentation Introduction of CBEMR and organic mangrove polyculture.	local authorities, local fishermen and some DMCR provincial representatives, in total 22 persons				Communications inventory in Dropbox. Correspondence with implementing partners/IUCN.
			MOU signing ceremony (IUCN/DMCR),	Presentation on CBEMR and Mangrove poly culture	60 people from DMCR and other IUCN partners				Communications inventory in Dropbox. Correspondence with implementing partners/IUCN. Annual report

Goal	Objectives	Sites	Activities	Results	Reach	Impact	Predicted outcomes	Realised outcomes	Means of assessment
			Policy brief	In draft form	Intended reach national, regional and local policy makers.				IUCN HQ
			EPIC flyer — Helping nature help us	Workshops, meetings, events	National				Communications inventory in Dropbox. Correspondence with implementing partners/IUCN
			EPIC -Thailand video	https://youtu.be/Ub0Z9x7NUYA Thai version: https://www.youtube.com/watch?v=BbKOTLoHJ8o MAP website 2700 views & IUCN website	Thai subtitle version developed for national audience Also shown at IUCN HQ Gland Reception and at the WCC 2016, and Eco Summit 2016 in France Also shown at least 5 international film festivals and won an honourable mention. Also shown at the Wildlife Vaasa Festival 2016 Finland, Ekotopfilm 2016 in Czech Republic and 2017 CMS VATAVARAN Film Festival and Forum, India				Communications inventory in Dropbox. Correspondence with implementing partners/IUCN

Goal	Objectives	Sites	Activities	Results	Reach	Impact	Predicted outcomes	Realised outcomes	Means of assessment
			Australia Mangrove Society and Mangrove Restoration Workshop (Feb 2014)	Presentation: Using Restoration to restore abandoned shrimp ponds in southern Thailand: Successes, challenges and lessons learned	35 people attended the workshop				Communications inventory in Dropbox. Correspondence with implementing partners/IUCN
		Inter-country learning and dissemination	International Disaster Risk Conference, Davos Aug 2014	Presentation Opportunities and Challenges of Implementing Ecosystem-based DRR - EPIC Mangrove Case Study	40 people listened to the presentation			Dissemination of CBEMR outside the country has been excellent.	Communications inventory in Dropbox. Correspondence with implementing partners/IUCN
			Regional Workshop on Incentives to Catalyse Sustainable Management and Restoration of Mangroves in Asia and the Pacific Oct. 2012, Beihai City, Guangxi, China	Presentation: Mangrove Rehabilitation and Livelihoods	50 people listened to the presentation				Communications inventory in Dropbox. Correspondence with implementing partners/IUCN Communications inventory in Communications inventory in Dropbox. Correspondence with implementing partners/IUCN

Goal	Objectives	Sites	Activities	Results	Reach	Impact	Predicted outcomes	Realised outcomes	Means of assessment
			Regional Forum on Solutions for Oceans, Coasts and Human Well-Being in Asia and the Pacific, in Cebu City, Philippines May 2014.	Presentation Community-based Ecological Mangrove Restoration: promoting natural mangrove recruitment	25 people listened to the presentation				Communications inventory in Dropbox. Correspondence with implementing partners/IUCN
			Asian Wetland Symposium / Ramsar Pre-COP12 Asia Regional Meeting, Siem Reap, Cambodia, Nov 2014	Presentation EPIC case study	Poster presentation attended by 200 people				Communications inventory in Dropbox. Correspondence with implementing partners/IUCN
			Inter-religious Ecology and Climate Conference II (Seoul, South Korea). April 2015.	Presentation Mangrove Forests, People's Livelihoods and Climate Change Adaptation	15 Religion Civil Society organisation representatives				Communications inventory in Dropbox. Correspondence with implementing partners/IUCN
			EcoSummit 2016, 29 Aug. - 1 Sep. 2016, Montpellier, France	Presentation Looking for mangroves resilience and sustainability	30 people listened to the presentation				Communications inventory in Dropbox. Correspondence with implementing partners/IUCN
			Mangroves for the Future Regional Colloquium, Chennai Aug 2012.	Presentation: Ecological mangrove restoration: re-establishing a more biodiverse and resilient coastal ecosystem with community	60 people listened to the presentation				Communications inventory in Dropbox. Correspondence with implementing partners/IUCN

Goal	Objectives	Sites	Activities	Results	Reach	Impact	Predicted outcomes	Realised outcomes	Means of assessment
				participation					
			Ecosystem Services for Climate Change Adaptation and Disaster Risk Reduction – a 'win-win' approach Regional Workshop for Oceania, 8-10 March 2017 Tanoa International Hotel, Nadi, Fiji	20 min. presentation and show EPIC Video Community Based Ecological Mangrove Restoration in Thailand for coastal vulnerabilities: EPIC mangrove case study	About 40 persons				Communications inventory in Dropbox. Correspondence with implementing partners/IUCN
			World Conservation Congress, Hawaii, USA, Sept. 2016	Several presentations	Global				Communications inventory in Dropbox. Correspondence with implementing partners/IUCN
			UNFCCC COP 21 in Paris:	EPIC as case study for UNFCCC: Thailand	Paper submitted				Communications inventory in Dropbox. Correspondence with implementing partners/IUCN
			Book: Protected Areas as Tools for Disaster Risk Reduction. Case study 'Protecting coasts from typhoons and tsunamis with mangrove: Krabi river estuary, Thailand'	Online http://reliefweb.int/sites/reliefweb.int/files/resources/2015-001.pdf	Global				Communications inventory in Dropbox. Correspondence with implementing partners/IUCN
			Youth from Drug Rehabilitation School, Koh Klang	MAP organised 3 hours' activities on mangrove ecosystem lesson and presented	Local				Communications inventory in Dropbox. Correspondence with

Goal	Objectives	Sites	Activities	Results	Reach	Impact	Predicted outcomes	Realised outcomes	Means of assessment
				about EPIC. Ending activities with planting mangrove seedling and propagules at EPIC site#1					implementing partners/IUCN
		Visitors to the CBEMR sites	Jeremy Clarke, an independent correspondent based in Kenya and Brian Harding CCA and Environment Consultant visited the EPIC site on Phrasong Village, Klang Island to write a story on climate change with a focus on Kenya and Thailand	Nothing published yet.					Correspondence with implementing partners
			Dr. Pei-Shan Sonia Lina, Ms. Nur Shafwaty Post Doc. from Geography Department, National University of Singapore undertook field research on Klang Island, Krabi. MAP facilitated the research by providing background information to the communities and EPIC, introducing Sonia to key stakeholders and locating a translator to work with her. The EPIC project will be discussed in the paper as one of the interventions underway.	Work has been published as a book chapter 'Ecosystem's role in empowering communities to face global environmental change: community-based ecological mangrove restoration in Thailand' which includes EPIC as a case study	Korean journal: regional reach				Correspondence with implementing partners

Goal	Objectives	Sites	Activities	Results	Reach	Impact	Predicted outcomes	Realised outcomes	Means of assessment
			DMCR staff together with local government and community representatives from project sites in Cambodia came to learn and exchange experiences in Thailand, One EPIC site was visited	13 people visited	Regional reach				Correspondence with implementing partners
			Visit from students of the Field School Course, Geography Dept., Faculty of Environmental Studies, York University, Toronto Canada	19 people visited	International reach				Correspondence with implementing partners
			Jacob Bukoski, MSc Student from the Yale School of Forestry and the Environment, USA	He is developing multiple linear regression model to predict levels of biomass and carbon in mangrove ecosystems. The model was validated with field-collected data at Koh Klang and the Krabi River Estuary & in Nakorn Sri Thammarat on the Gulf of Thailand, as a potentially an inexpensive and reliable way of estimating carbon stock in mangroves without having to undertake extensive field sampling (which is expensive and	Published http://journals.plos.org/plosone/article?id=10.1371/journal.pone.0169096				Correspondence with implementing partners

Goal	Objectives	Sites	Activities	Results	Reach	Impact	Predicted outcomes	Realised outcomes	Means of assessment
			time-consuming).						
			Tania Kanchanarak, studying for Master's degree in Environmental Science at the University of Zurich, Switzerland.	Thesis on mangrove restoration projects in South-Western Thailand	https://drive.google.com/file/d/0ByrD5ntfjv98OWZrbU1BNlVCRW8/view				Correspondence with implementing partners
			Allison Jacobson, a Master grad in Environmental Planning from U of California used MAP of office as a base for her travel grant research on Mangrove Protection and Restoration in Protected Areas in Thailand, Malaysia, Cambodia and Thailand	No publication yet.					Correspondence with implementing partners
			Angie Elwin, a PhD student at Reading University who will be study disturbance to mangrove in Thailand with two research sites; one on Koh Klang in Krabi and the 2nd in Chanthaburi province in the Gulf of Thailand.	Starting field research on Koh Klang, Krabi March 2017					Correspondence with implementing partners
			Jim Pettiward, Communication Coordinator from Synchronicity Earth Foundation for the purpose of fund raising for MAP						Correspondence with implementing partners

Goal	Objectives	Sites	Activities	Results	Reach	Impact	Predicted outcomes	Realised outcomes	Means of assessment
			Bastian Hartig Southeast Asia Correspondent, Deutsche Welle (DW) shot a video "New life in old shrimp ponds" using EPIC sites within the programme "Global 3000"	http://www.dw.com/en/new-life-in-old-shrimp-ponds/a-19361443	Global				Correspondence with implementing partners
									Correspondence with implementing partners

13. Annex 13 . Detailed Results
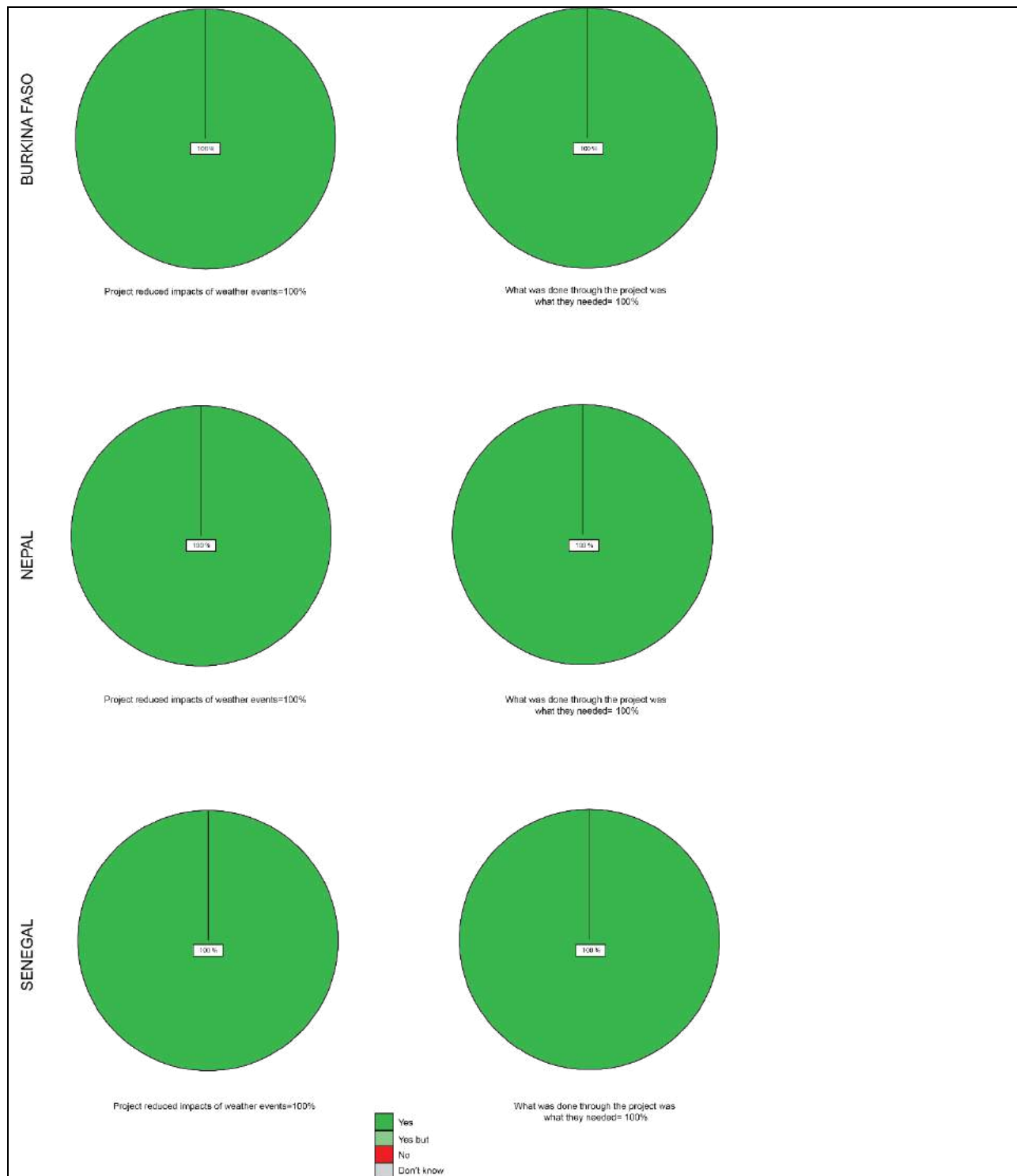
Figure 24. Project reduced extreme weather events and was what communities wanted
(Thailand was omitted from this analysis as the CBEMR was carried out on private land and has not been successful enough for responses as above.)
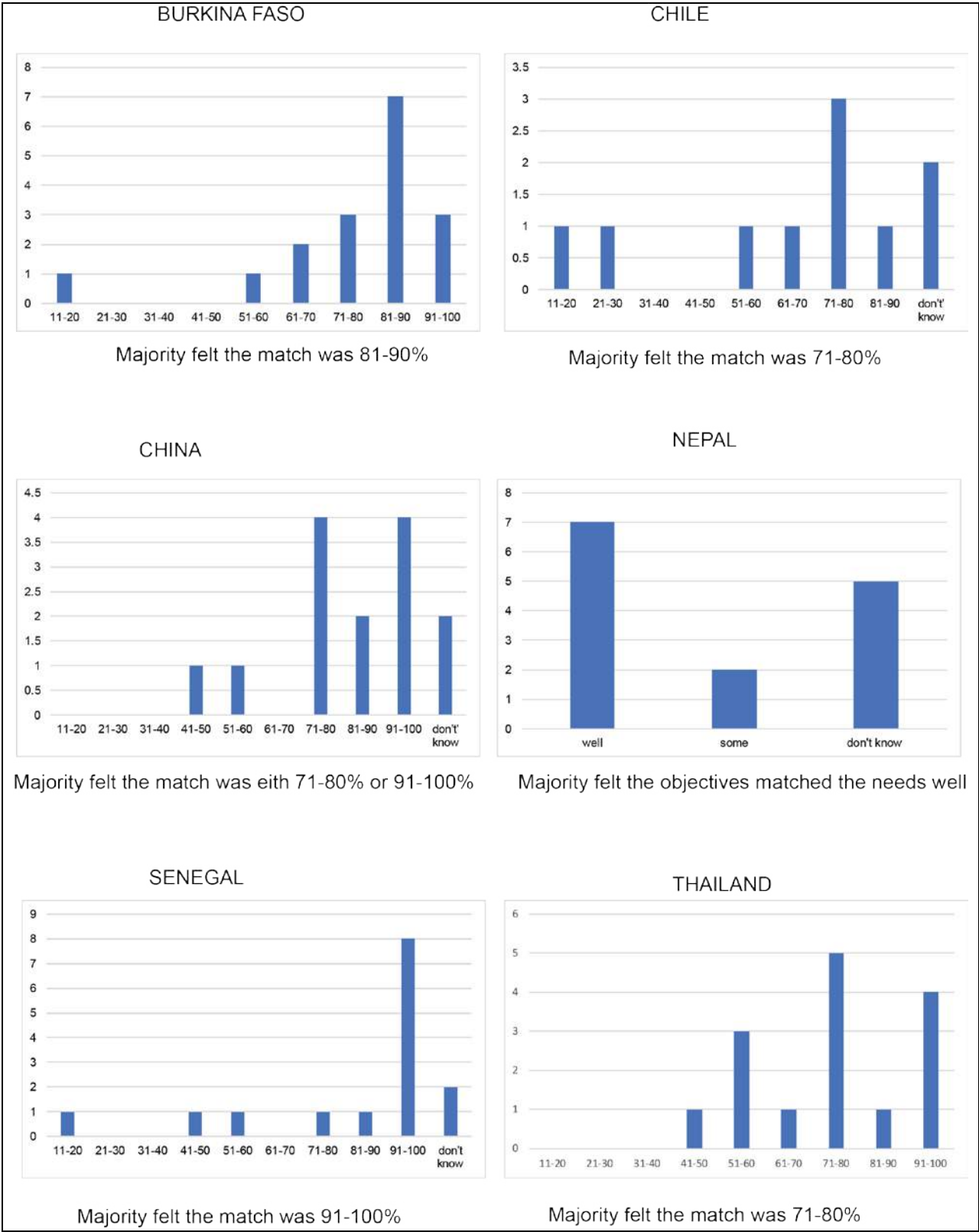
Figure 25. Perceived match between project objectives and beneficiaries' needs (Group 2)
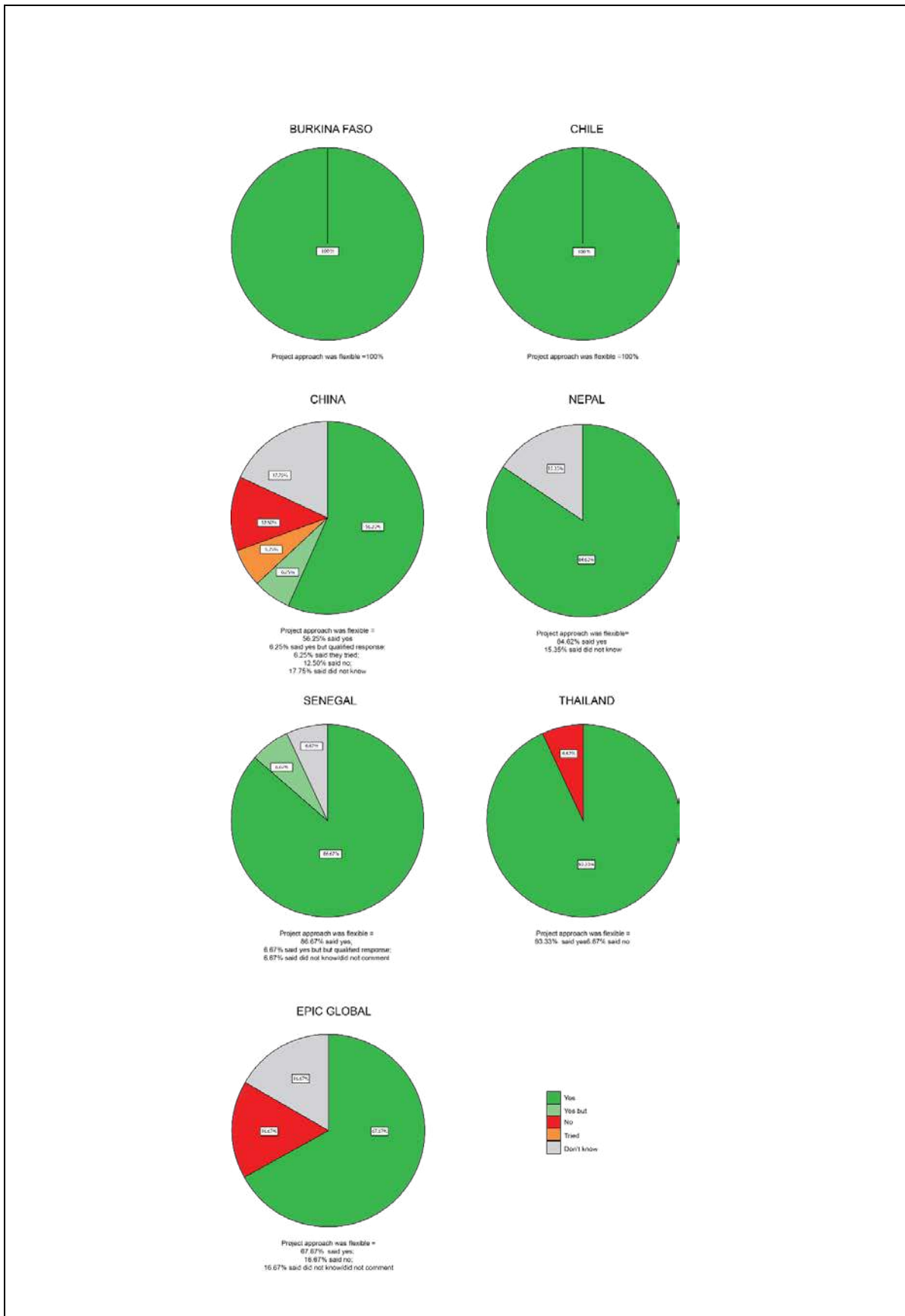
Figure 26. Project flexibility according to Group 2 and 3
(Source:> Country-wise interviews, 201`6, and 2017, and HQ interviews 2016)
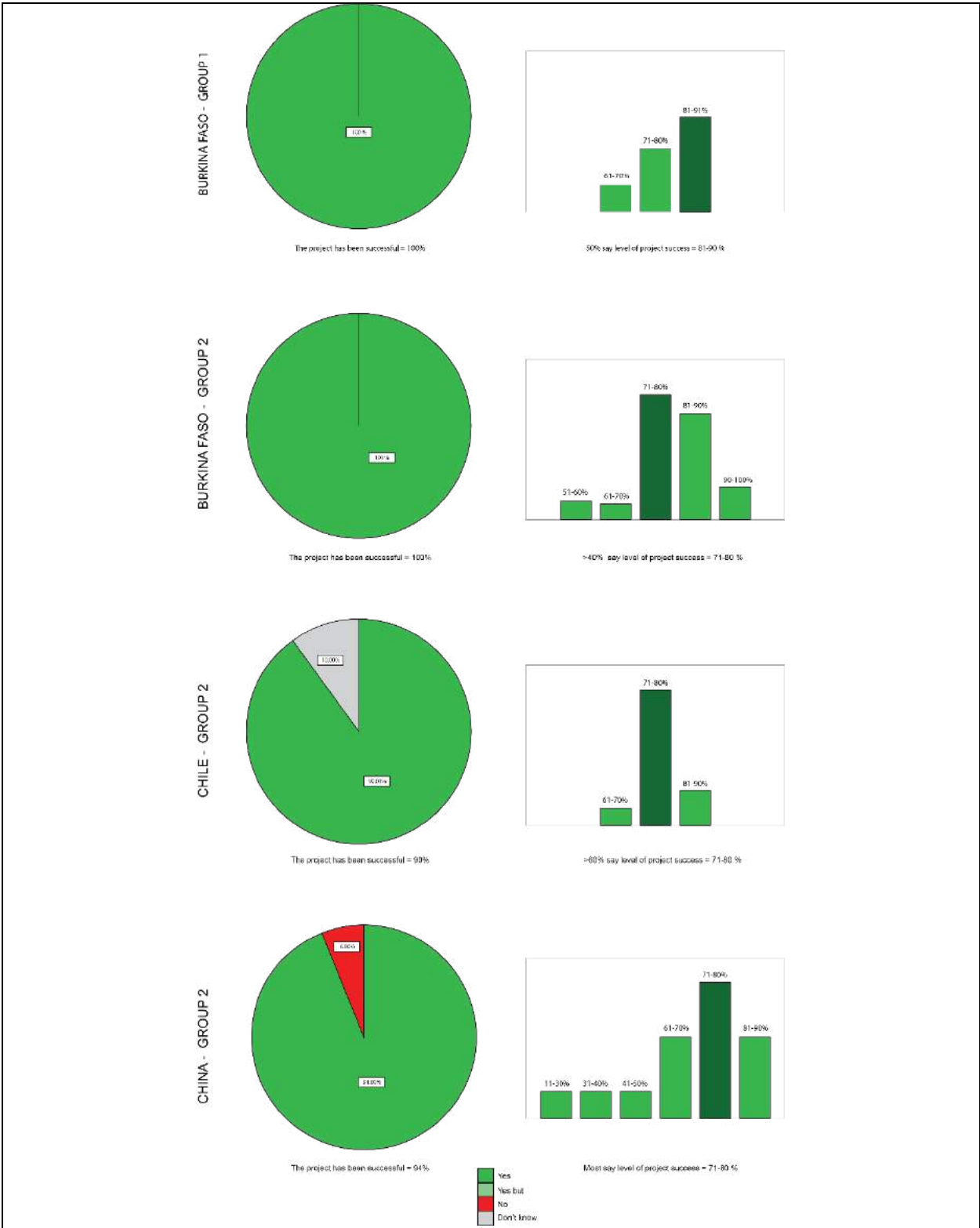
Figure 27. Success of EPIC and percentage success by country and group, Burkina Faso, Chile and China
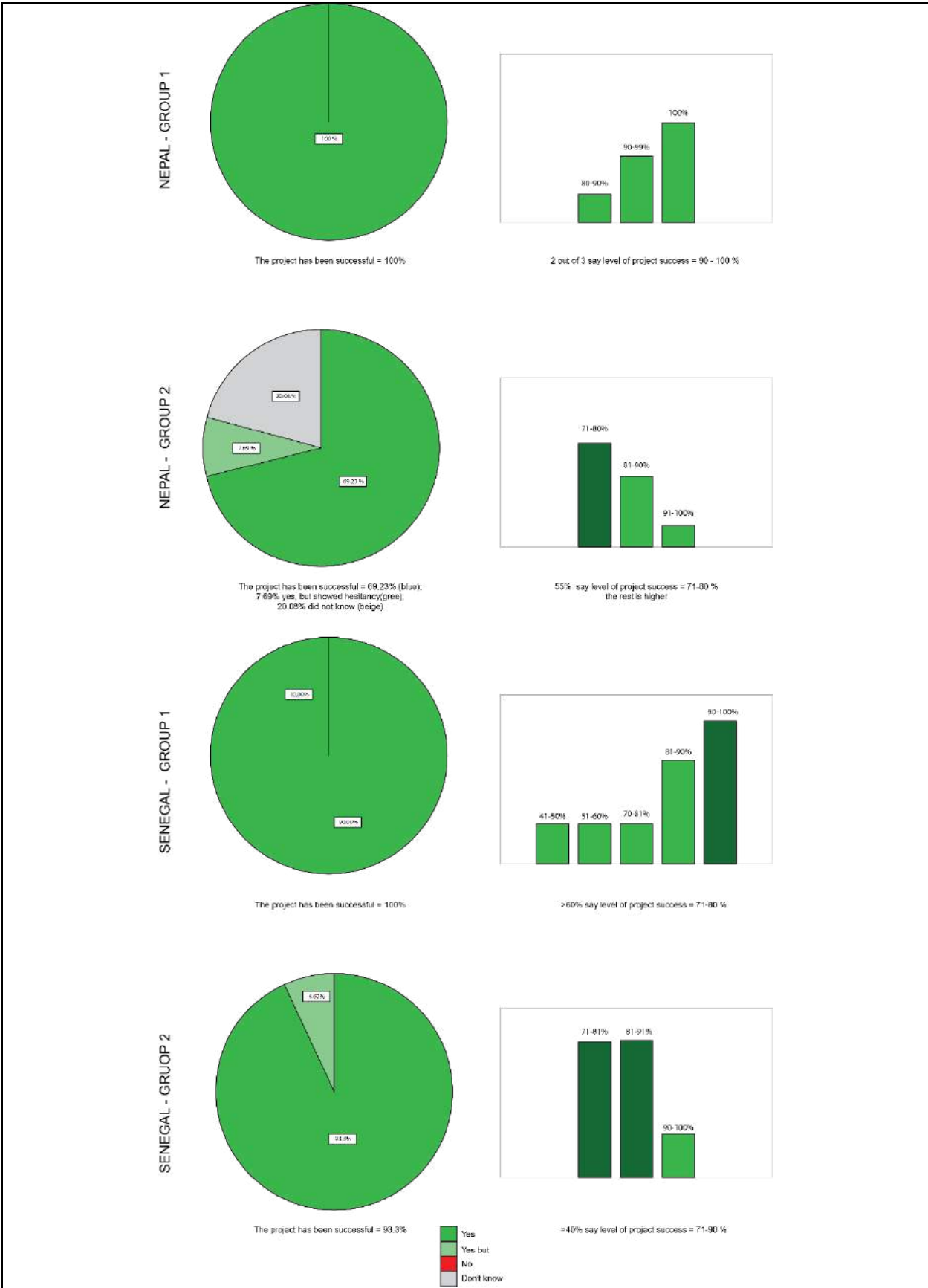
Figure 28. Success of EPIC and percentage success by country and group, Nepal and Senegal

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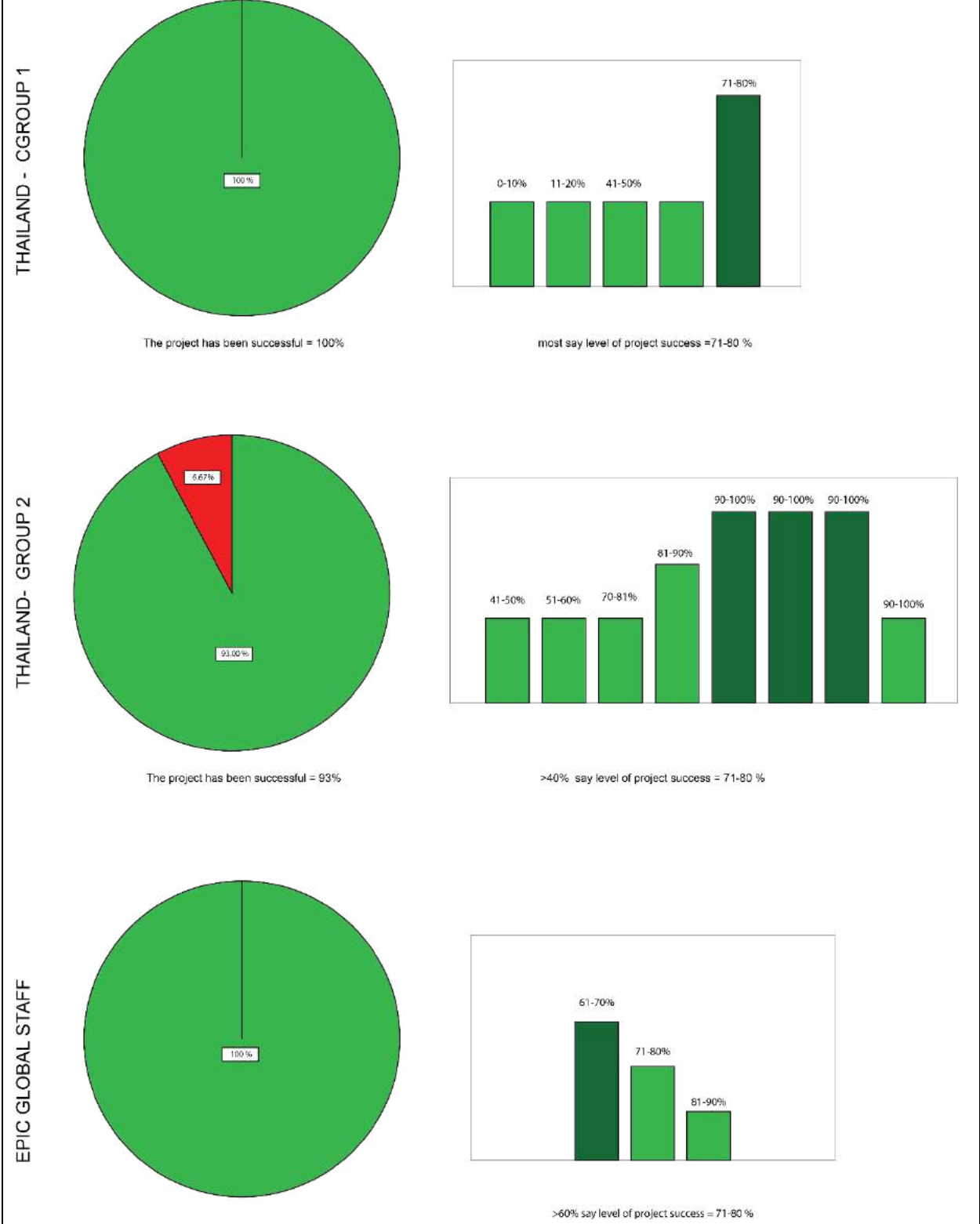
Figure 29. Success of EPIC and percentage success by country and group, Thailand and EPIC Global staff (for overall project success)

EFFECTIVENESS

BURKINA FASO
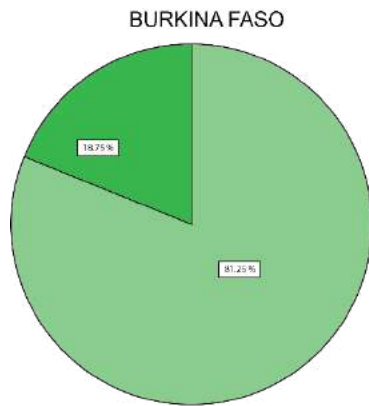
Project approach in delivering what was wanted:
very effective= 18.75%; effective =81.25%

CHILE
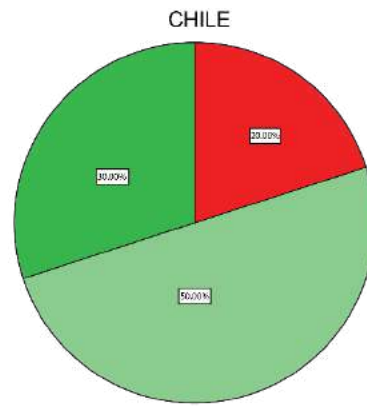
Project approach in delivering what was wanted
very effective=30% ; effective= 50%; not effective=20%

CHINA
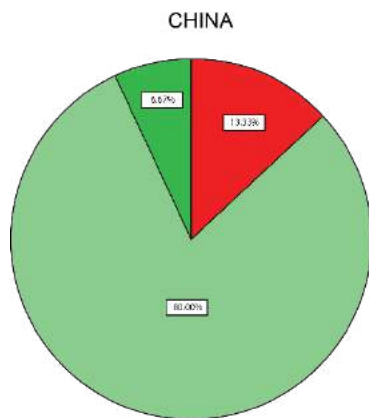
Project approach in delivering what was wanted
6.67%= very effective; 80%=effective; 13.3% not effective

NEPAL
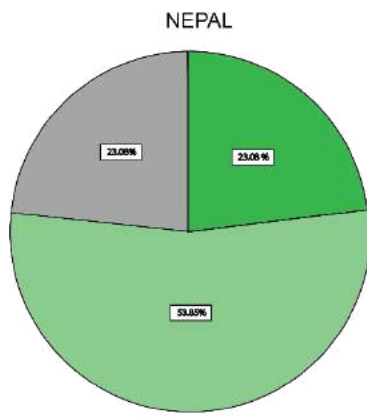
Project approach in delivering what was wanted 23.08% = very effective;
53.85% =effective; 23.08% =did not know

SENEGAL
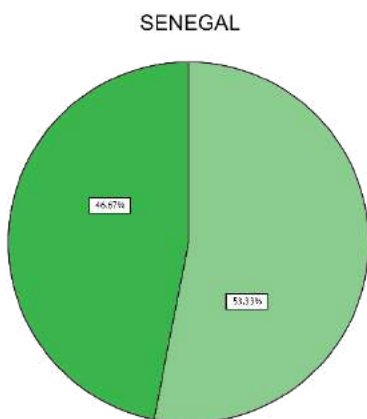
Project approach in delivering what was wanted
46.67%=very effective; 53.33%= effective

THAILAND
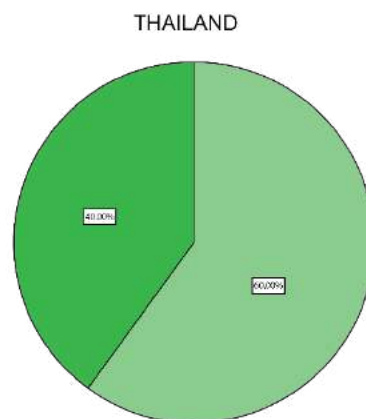
Project approach in delivering what was wanted
40% = very effective; 60% = effective

Very effective
Effective
Not Effective
Don't know

Figure 30. Effectiveness in the approach in delivering the desired outputs according to Group2

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33.33%= very effective; 66.67% effective
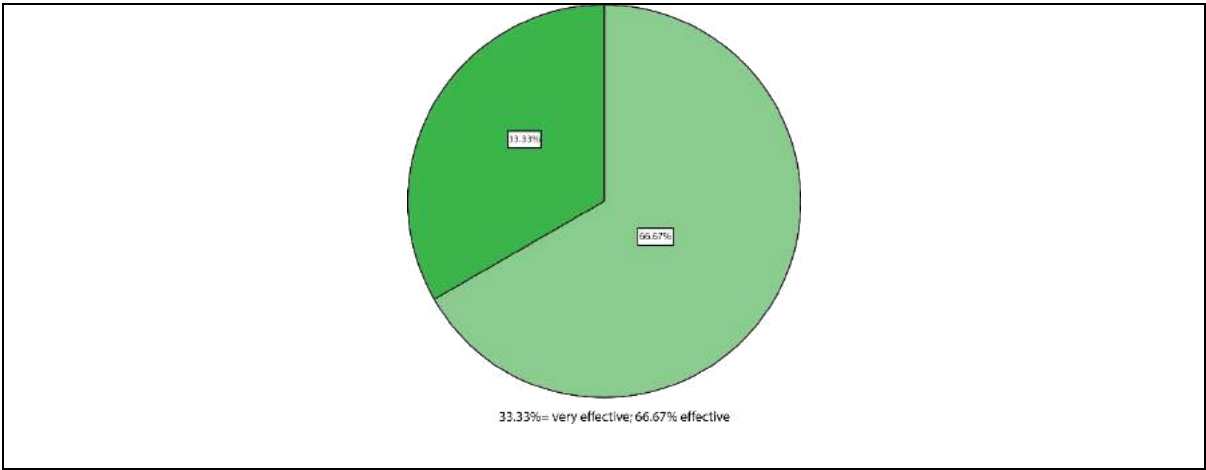
Figure 31. Effectiveness in the approach in delivering the desired outputs according to Group 3

BURKINA FASO

Project approach was **consensus-oriented** =100%
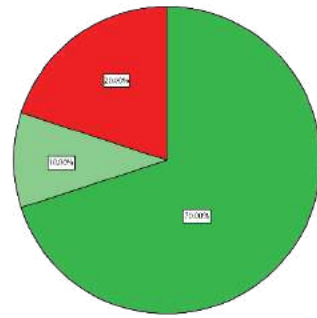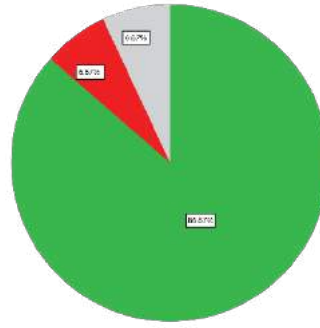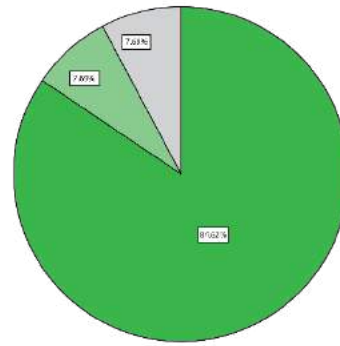
Project approach was **participatory**= 100%
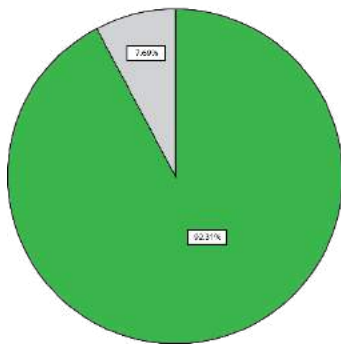
Project approach was **aligned with national laws and policies**=100%
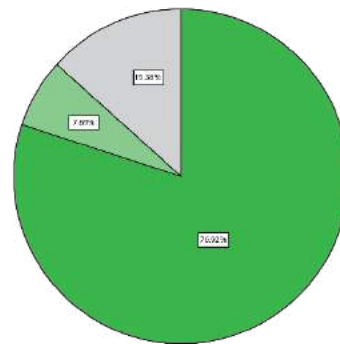
Project approach was **transparent**= 100%
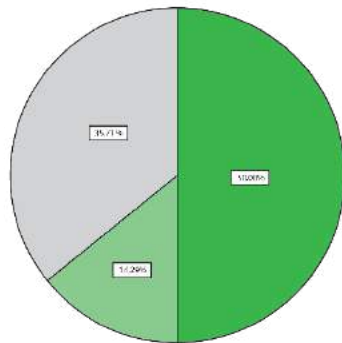
Project approach was had **built-in accountability**=100%
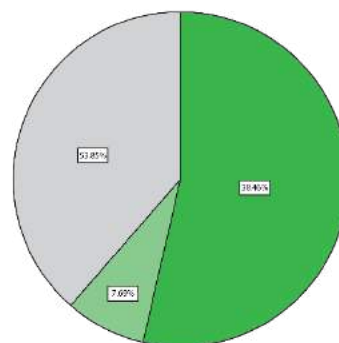
Project approach had a **gender balance**= 94.12%=yes; 5.88%=yes but qualified response

Yes
Yes but
No
Don't know

Figure 32.Burkina Faso: Good governance indicators and gender
(Source: Burkina Faso interview, 2017)

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Figure 33.Chile: Good governance indicators and gender
(Source: Chile interviews, 2017)

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Figure 34.China: Good governance indicators and gender
(Source: China interviews, 2017)

Figure 35.Nepal : Good governance indicators and gender
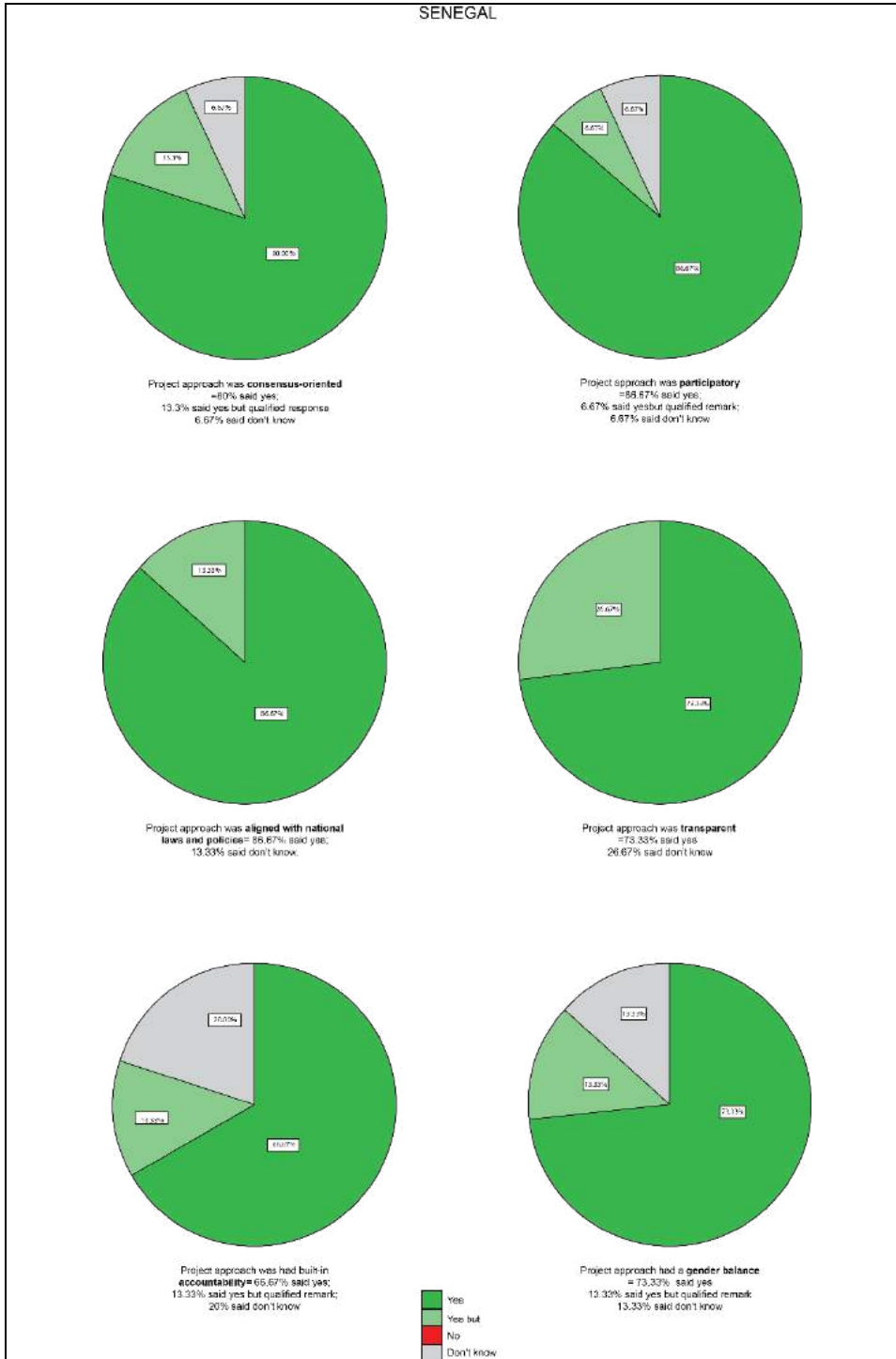(Source: Nepal interviews, 2016)

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Figure 36. Senegal: Good governance indicators and gender
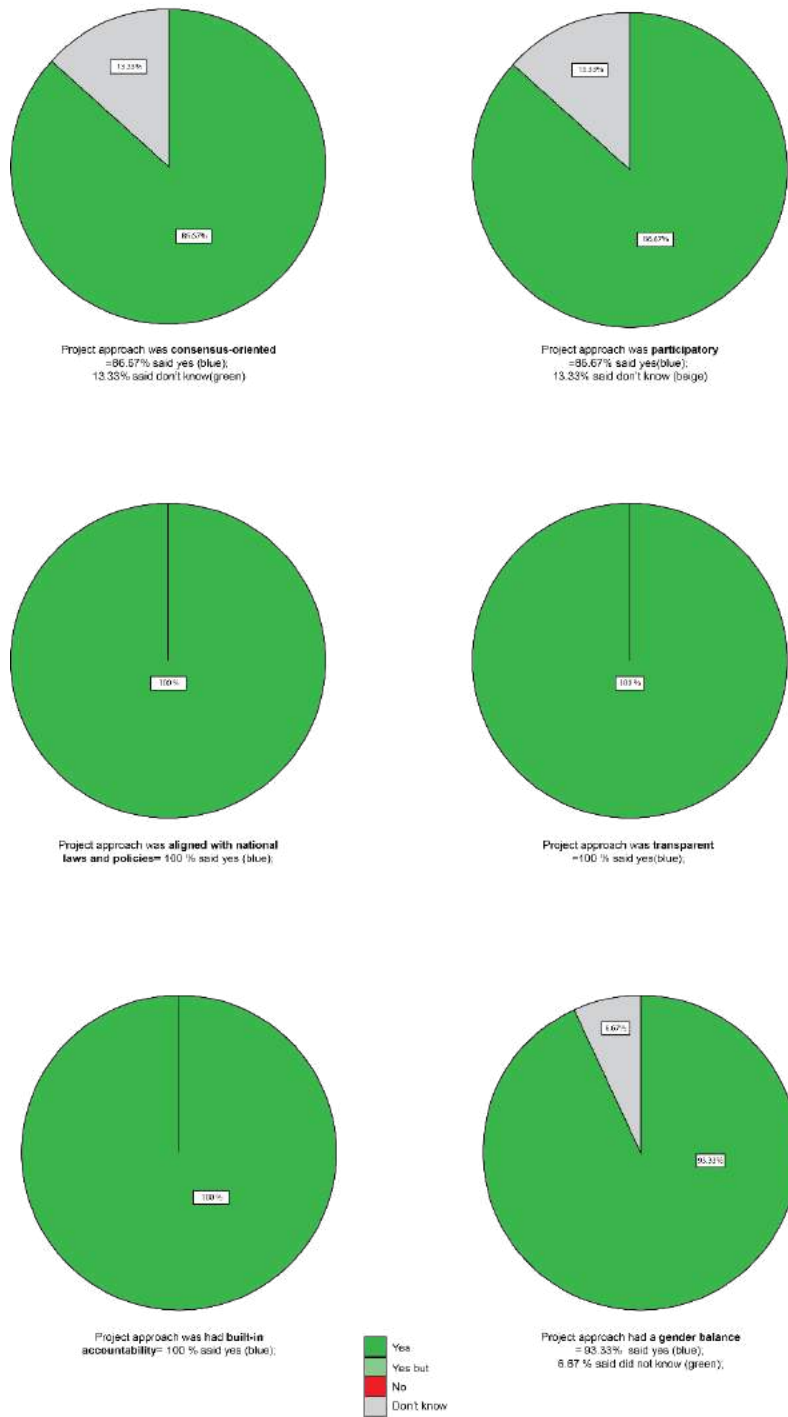(Source: Senegal interviews, 2017)

Figure 37. Thailand: Good governance indicators and gender
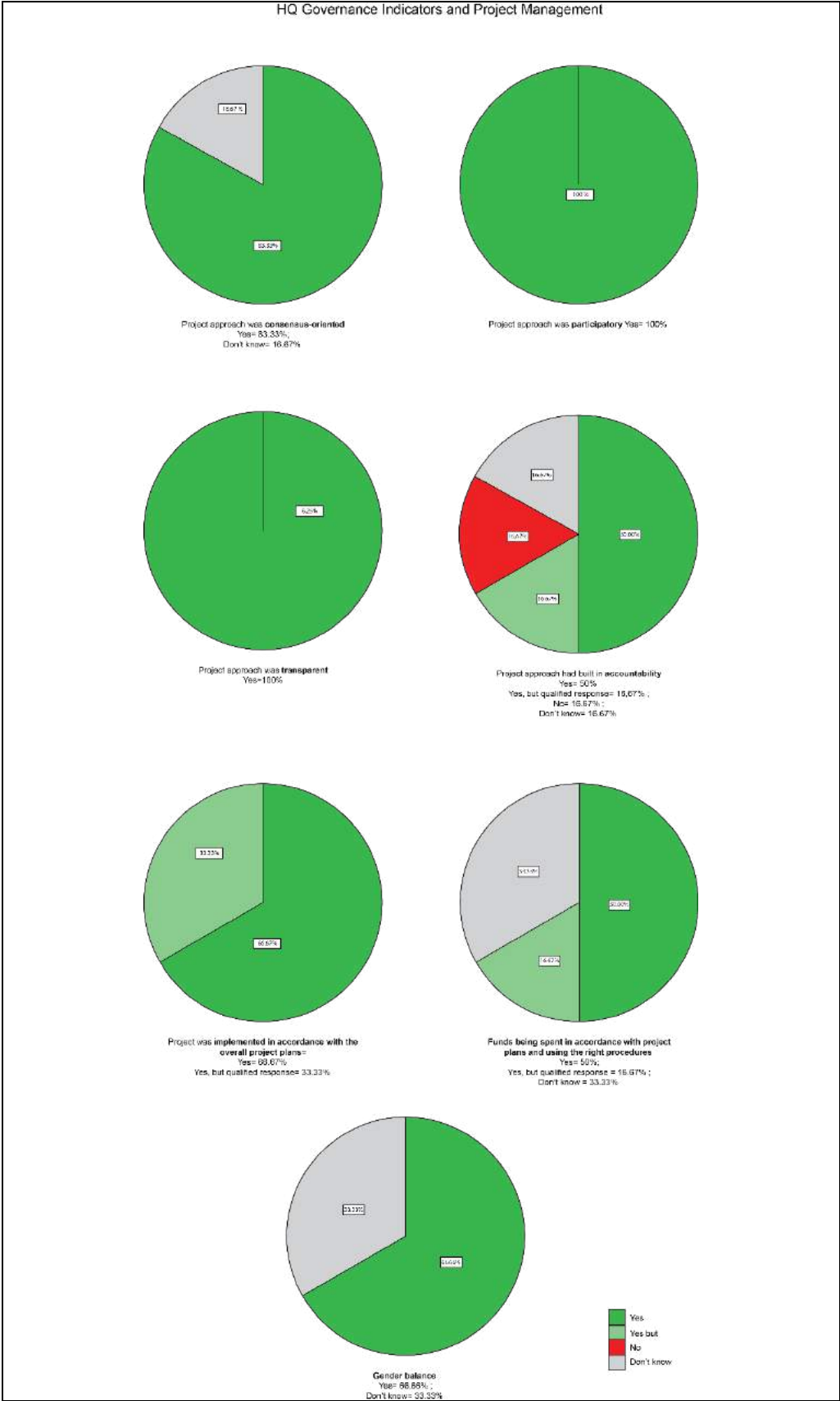(Source: Thailand interviews, 2016)

Figure 38. EPIC Global: Good governance indicators and gender, and project management
(Source: HQ interviews, 2016)

Figure 39. Replicability and Scaling up of EPIC, Burkina Faso, Chile, China and Nepal
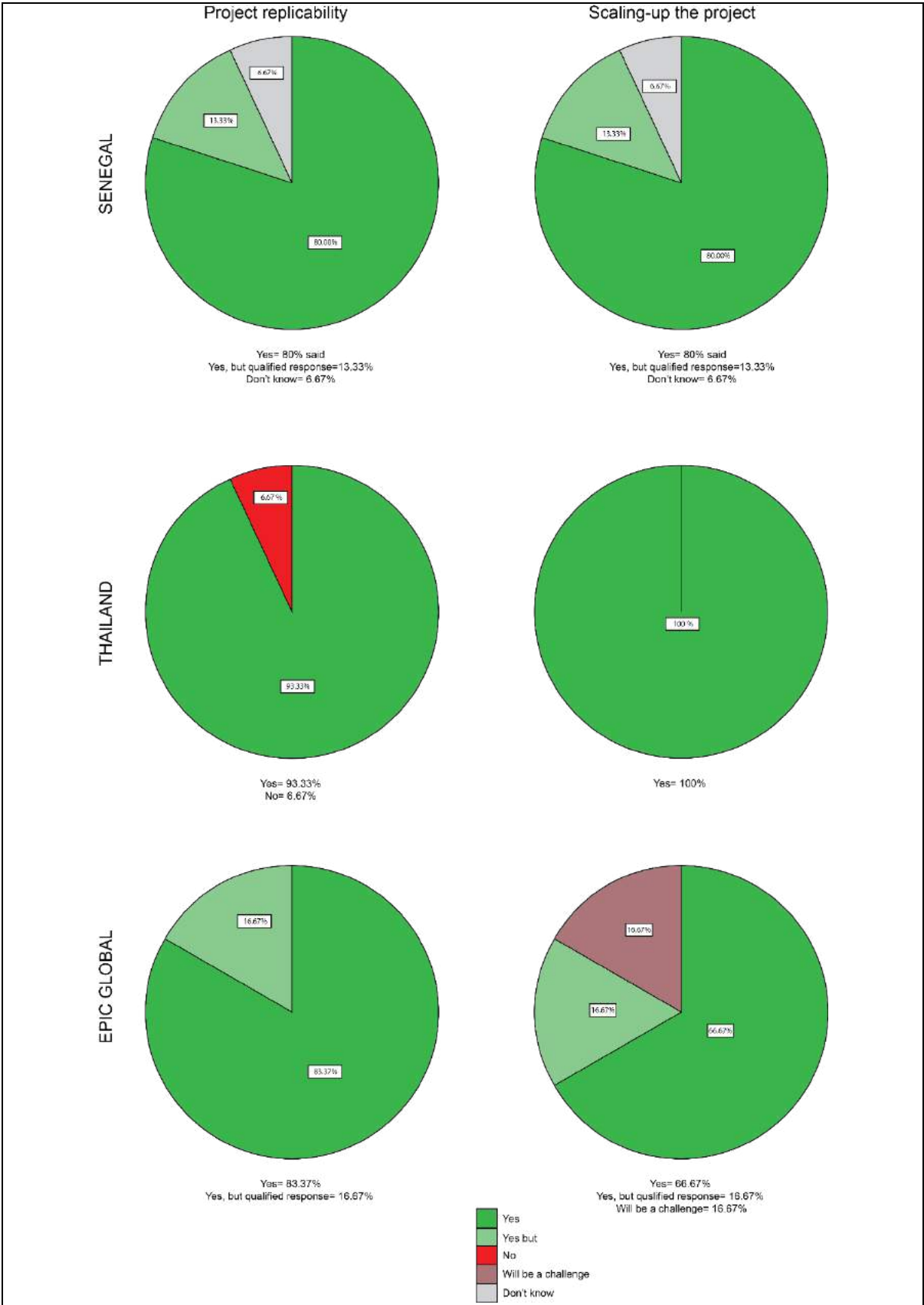(Source: Country-wise interviews , 2016 and 2017)

Figure 40. Replicability and Scaling up of EPIC, Senegal, Thailand and EPIC Global
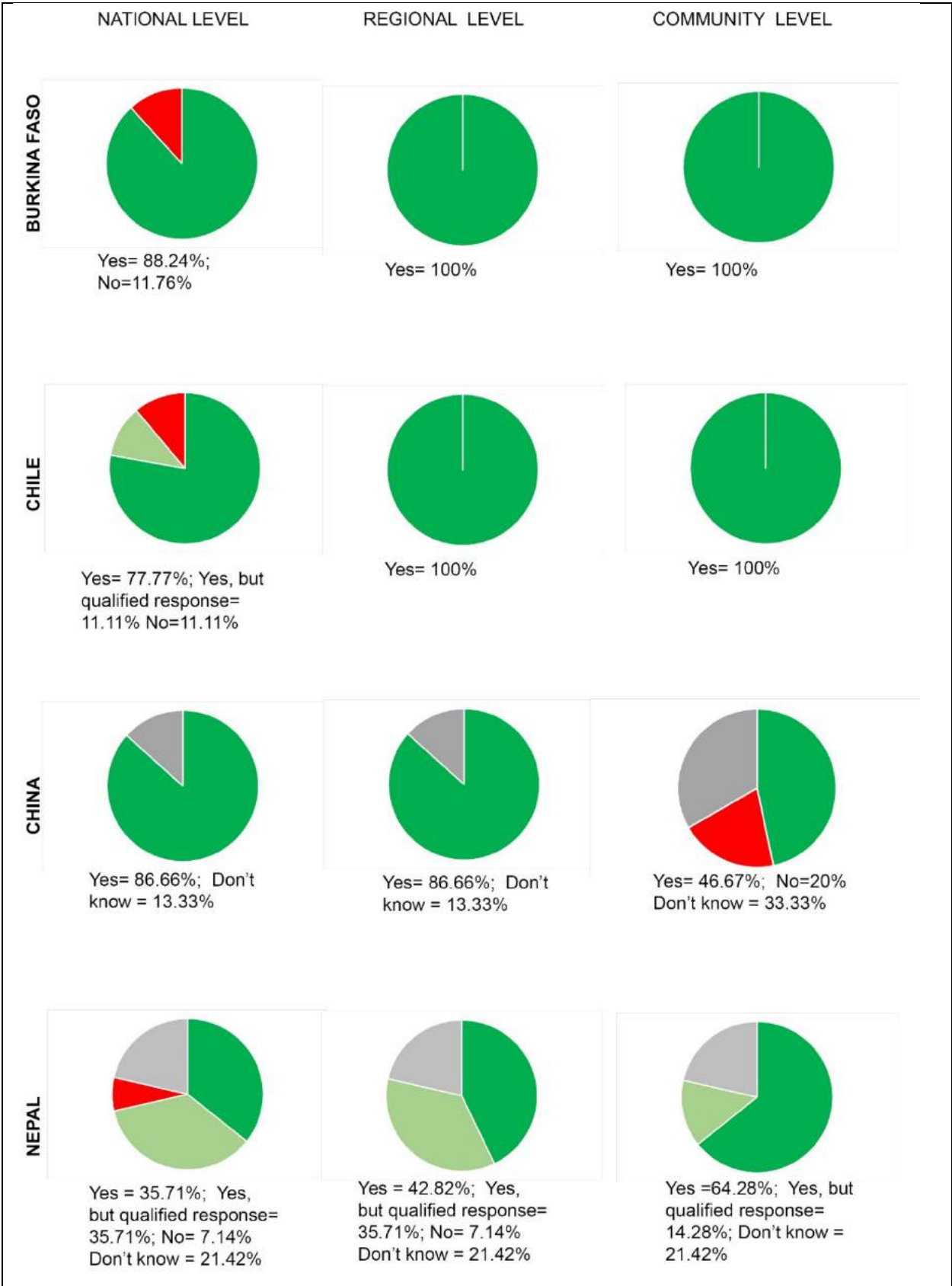(Source: Country-wise interviews , 2016 and 2017)

NATIONAL LEVEL **REGIONAL LEVEL** **COMMUNITY LEVEL**

BURKINA FASO
Yes= 88.24%;
No=11.76%

Yes= 100%

Yes= 100%

CHILE
Yes= 77.77%; Yes, but
qualified response=
11.11% No=11.11%

Yes= 100%

Yes= 100%

CHINA
Yes= 86.66%; Don't
know = 13.33%

Yes= 86.66%; Don't
know = 13.33%

Yes= 46.67%; No=20%
Don't know = 33.33%

NEPAL
Yes = 35.71%; Yes,
but qualified response=
35.71%; No= 7.14%
Don't know = 21.42%

Yes = 42.82%; Yes,
but qualified response=
35.71%; No= 7.14%
Don't know = 21.42%

Yes =64.28%; Yes, but
qualified response=
14.28%; Don't know =
21.42%

Figure 41. Project design was appropriate to the needs at every level - national, local, community part 1

	NATIONAL LEVEL	REGIONAL LEVEL	COMMUNITY LEVEL
SENEGAL	Yes= 86.86%; Don't know= 13.33%	Yes= 100%	Yes= 100%
THAILAND	Yes= 73.33%;No=13.33%; Don't know= 13.33	Yes= 86.66% Don't know= 13.33%	Yes= 86.66% Don't know= 13.33%
EPIC GLOBA	Yes= 33.33%; Yes, but qualified response= 16.66%; No=16.66% Don't know = 33.33%	Yes= 100%	Yes= 66.66%; Yes but qualified response = 33.33%
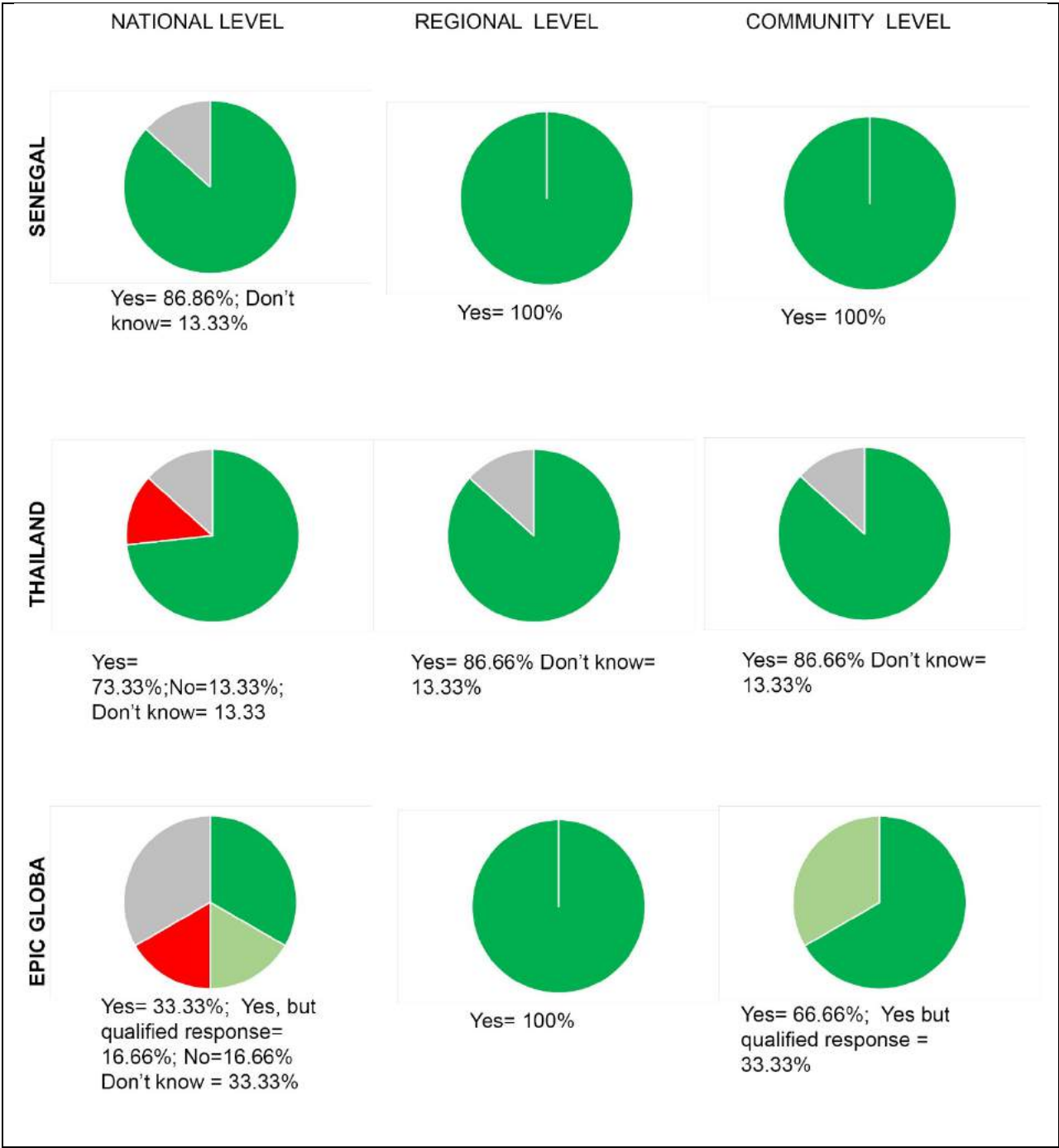
Figure 42. Project design was appropriate to the needs at every level - national, local, community part 2
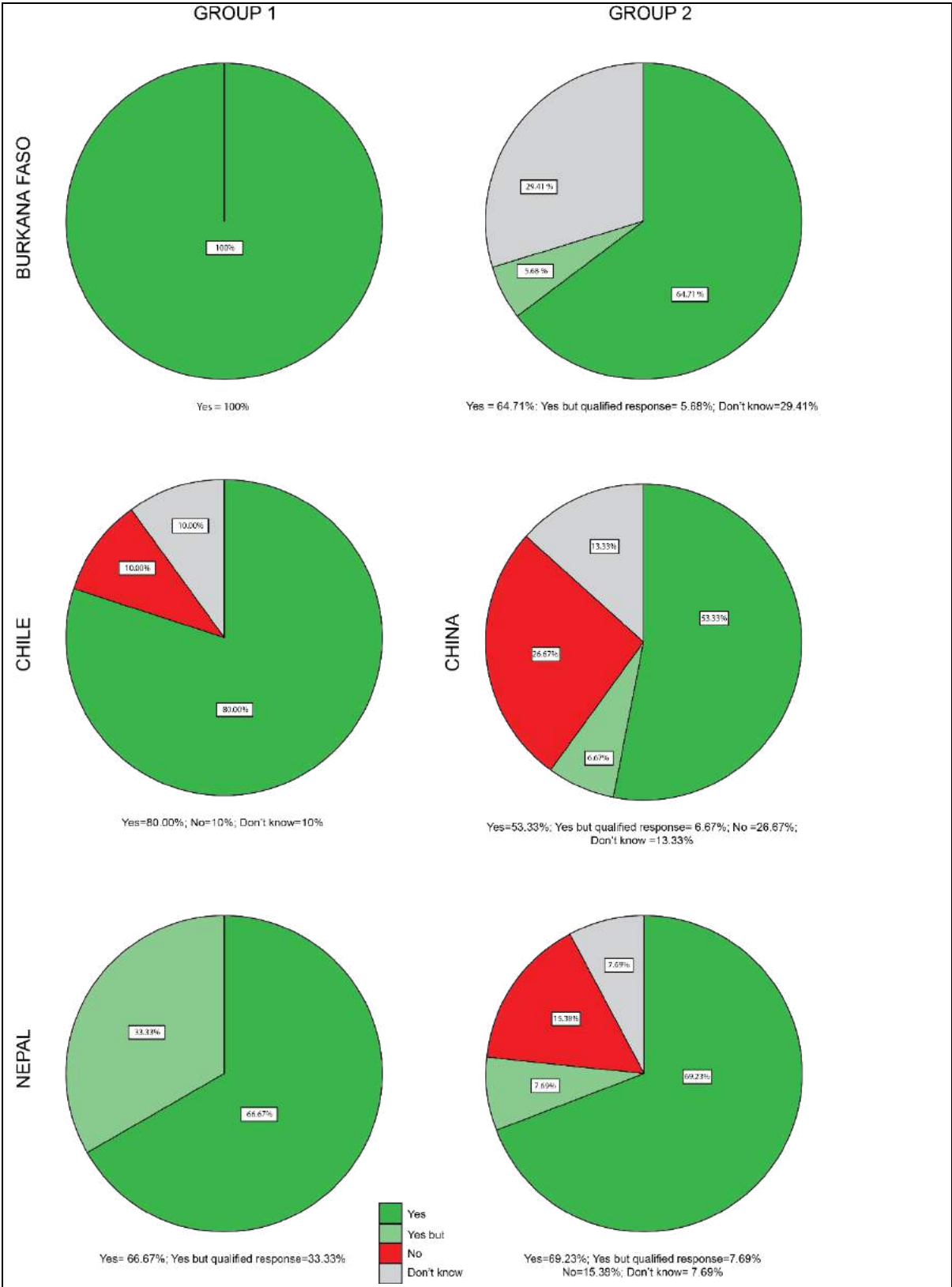
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Figure 43. Continuation of activities after the project is over Burkina Faso, Chile, China and Nepal
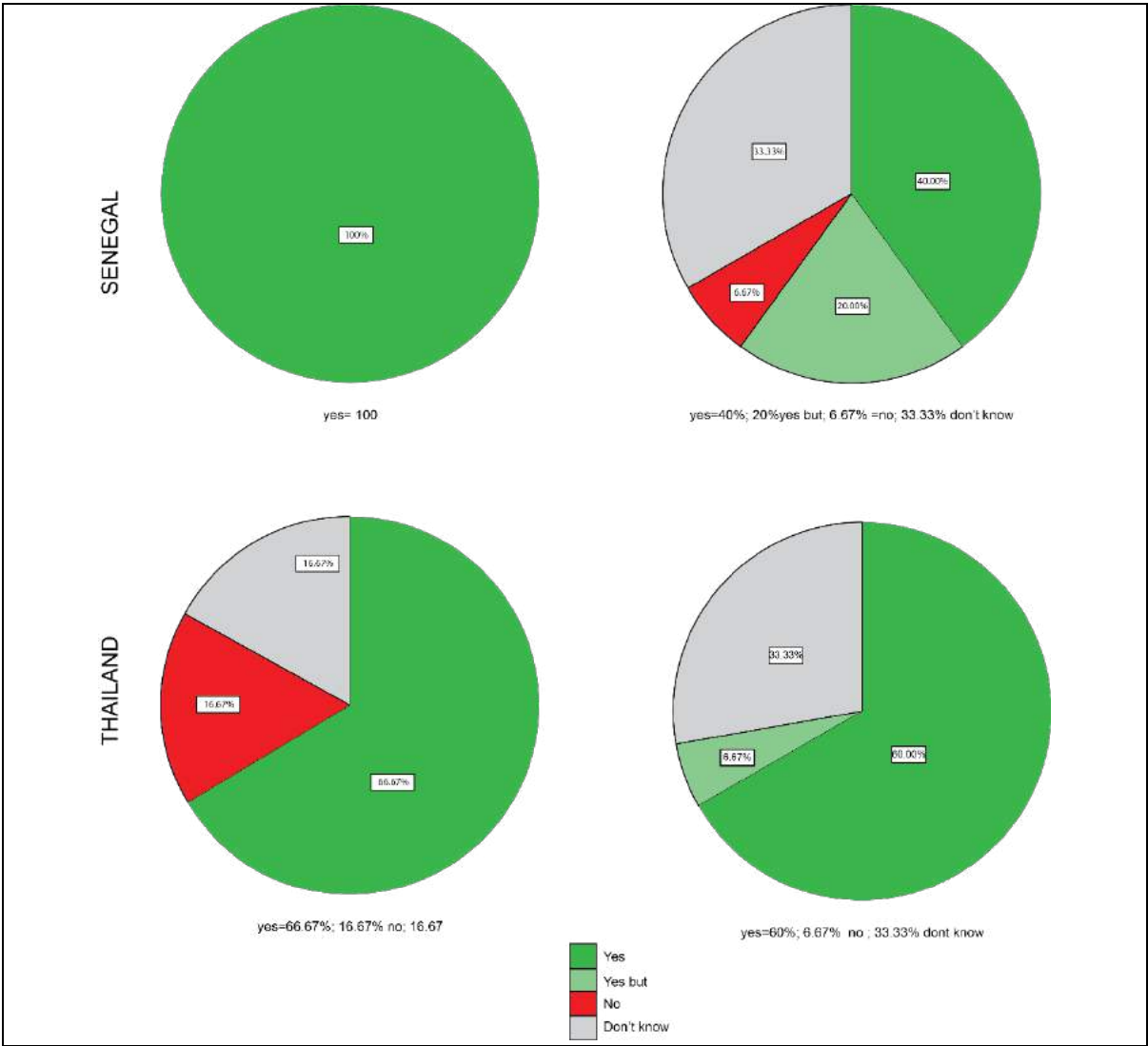(Source: Country-wise interviews , 2016 and 2017)

Figure 44. Continuation of activities after the project is over Senegal and Thailand
(Source: Country-wise interviews , 2016 and 2017)

Figure 45. The EPIC project has brought about desired changes in the behaviour of communities.
(Source: Country-wise interviews , 2016 and 2017)

Figure 46. The EPIC project has brought about desired changes in the behaviour of organizations
(Source: Country-wise interviews , 2016 and 2017)

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Figure 47. The EPIC project has brought about changes in policy, and there are changes already (Burkina Faso, Chile and China)
(Source: Country-wise interviews , 2016 and 2017)

Figure 48. The EPIC project has brought about changes in policy, and there are changes already (Nepal, Senegal, Thailand and EPIC Global)
(Source: Country-wise interviews , 2016 and 2017)