HABITAT LOSS

Vast territories of the world and millions of its inhabitants are seriously exposed to desertification and sea-level rise.[253] Most of the measures used to counteract the effects of these trends involve major environmental management projects, which run into the millions or tens of millions of dollars and take years to implement. As more and more areas come under serious stress due to sea-level rise and desertification in the period through 2030, the costs of responding to those problems will increase. Given the fact that most programmes take time to deliver positive results, it is important to implement them quickly in areas where the impacts are currently the most extreme.

HIGH
Overall Effectiveness Rating

14 #Actions Assessed

FINDINGS

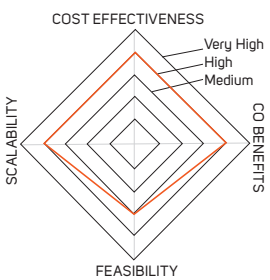
The impacts of desertification and sea-level rise are being felt around the world. In some of the larger countries, the number of people directly affected by desertification can run into the hundreds of thousands, even millions. Such populations are under extreme stress as their lands dry up and whole regions become unsuitable for productive use. Sea-level rise, meanwhile, affects the more than 1 million kilometres of the world's coastline and immediate hinterland.[254]

Only around 30-40 countries experience the main effects of desertification. The most intense impacts are taking place in Southern and West Africa. The largest populations at risk from desertification are in India, China, and the United States, which in 2010 have more than 2 million people threatened. This figure will rise to nearly 8 million by 2030.

Damage from rising seas is more widespread, since every coastline on the planet is affected. The worst effects are still quite concentrated in either relative (mainly small island states or river estuaries in Africa and Asia) or absolute terms (wealthy low-lying nations like Holland) and primarily affect fewer than 30 countries (aside from a number of very small island nations not included in our analysis). Where sea-level rise is most acute, its effects are final. Desertification and sea-level rise share many of the same effects, in particular the slow decimation of fertile soil, not only by heat and water stress, but also by salt intrusion into land and water supplies.[255] However, it is coastal land, not desert borderlands, that will completely disappear at a slow but unstoppable rate throughout the 21st century, eroding into the sea and not returning.[256]

Rapid and accelerating desertification is often caused by human activities linked to agriculture, in particular burning, over-grazing, over-cultivation, unsustainable deforestation, and over-exploitation of water supplies. Climate heat and water shocks worsen man-made land degradation in dryland regions and may further expose vulnerable communities that are dependent on ecosystems as a buffer

REVIEW FINDINGS



to climate-induced threats.[257] Growth of populations and economic activity compound these environmental pressures leading to desertification.

Tackling the loss of human habitat is still a pioneering field and is, in some cases, practically cost-prohibitive. One livestock management programme in Eritrea to protect some 1,000 people from the worst effects of desertification is estimated to cost USD 5 million for three years of protection.[258] For sea-level rise the costs can be even higher, but so can the losses. Consider the USD 10 billion per year cost that China already faces or the nearly 30% of GDP potential of Guinea-Bissau.

With expenses so high, the international community may soon have to choose which communities will be protected and which must be relocated. Migration can be considered a cost-effective adaptation tool where habitat loss hits hardest. The cultural cost to communities would be severe. Most of us today simply cannot fathom the total relocation of entire island or dry-region communities.

IF MEASURES ARE IMPLEMENTED ADEQUATELY, A NUMBER OF PROGRAMMES WILL CONTINUE TO DELIVER BENEFITS FOR DECADES TO COME

THE REVIEW

The most promising measures to counter the effects of habitat loss are, overall, less cost-effective than measures to manage other climate-related problems, such as disease and extreme weather.

The cost of habitat-loss intervention is typically measured in the millions and often involves a serious capital outlay that is not directly tied to a private commercial concern. So the building of a sea wall, the planting of trees, or the elevating of key infrastructure by several metres is a costly method of protecting populations and their assets when compared to other measures assessed in this report.[259] Some of the cheapest actions assessed here include a half million dollar effort to conserve and restoration of vegetative cover (such as dryland grasses) in areas threatened by desertification and a 1 million dollar per-implementation programme to restore mangrove forests in coastal areas.[260] Upgrading drainage systems threatened by coastal flooding, however, can cost USD 20 - 40 million.[261] Despite such expenses, several studies have documented that such actions are still cost-effective compared to the potential losses.[262]

Just as desertification is caused by factors other than climate change, the measures to combat it also protect populations from wider concerns.[263] This is less true for actions that address the effects of sea-level rise. In fact, many measures in this area actually have negative effects on the environment. Coastal barriers, for example, reduce tidal flow from the sea, trapping water inland and forcing more salt into the soils of the littoral, rendering even more land unfertile.[264]

Poor communities will rarely be able to access the type of long-term, infrastructure-intensive adaptation measures required to protect against habitat loss. This means the worst-affected communities are particularly dependent on international assistance in order to adapt and not be displaced from their homelands.

Scalability of habitat-loss programmes, however, is made easier by the fact that such programmes have typically been implemented a number of times before, so technical specifications and training programmes are usually available.

Despite isolated good examples, however, evidence indicates that most actions rate low on cost-effectiveness. Interventions are complex, and it's difficult to make any generalizations regarding the costs involved, so effectiveness often needs to be assessed on a project-by-project basis. Several implementation risks are also of concern, such as extreme weather hazards to beach extension/nourishment projects, or land-use conflicts among local communities of farmers and fishermen in cases of dryland restoration programmes or mangrove plantation efforts.[265] More quantitative information would help local policy-makers and communities prioritize their efforts to adapt to desertification and sea-level rise.

MEASURES TO COMBAT DESERTIFICATION ALSO PROTECT POPULTATION FROM WIDER CONCERNS

TIMEFRAME CONCERNS

Almost every programme assessed here takes two to five years to implement. With only a handful of exceptions, most measures that address habitat loss take several years to put in place. Given that many vulnerable countries have yet to implement such projects, millions of people are currently either suffering s erious economic losses –particularly populations that depend on agriculture for their livelihoods – or are being forced to flee the worst-affected zones.[266]

If measures are implemented adequately, however, a number of programmes will continue to deliver benefits for decades to come and will show long-term returns on the initial capital outlay. Forests of mangroves or dryland trees, for instance, will continue to deliver benefits for more than 20 or 30 years. Robust sea walls, if well maintained, could protect for a century or more against coastal risks.

Deard trees form an eerie tableau on the shores of Maubara Lake in Timor-Leste. Source: UN Photo/Martine Perret.

HABITAT LOSS **ADAPTATION ACTIONS**

	ACTION SET	VULNERABILITIES	MOST VULNERABLE POPULATIONS	EFFECTIVENESS RATING	EVIDENCE RATING
1	COASTAL PROTECTION (SEA WALLS AND DIKES)	• Inundation (loss of dryland) • Erosion (direct and indirect change)		Medium	Medium
2	BEACH NOURISHMENT	• Inundation (loss of dryland) • Erosion (direct and indirect change)		High	High
3	MANGROVE BARRIERS AND RESTORATION	• Saltwater intrusion		High	Very High
4	"BACK-AWAY" ELEVATION	• Erosion (direct and indirect change)		High	High
5	SALTWATER-INTRUSION BARRIERS	• Saltwater intrusion		Medium	Medium
6	LAND-USE PLANNING	• Wetland loss (and change)		Medium	Medium
7	DRAINAGE SYSTEMS UPGRADE	• Rising water tables and impeded drainage		Very High	High
8	CONSERVATION AND RESTORATION	• Desertification		Medium	Medium
9	SOIL CONSERVATION	• Desertification		High	Very High
10	FORESTATION	• Desertification		High	Very High
11	ENHANCED LIVESTOCK MANAGEMENT	• Desertification		Medium	Low
12	INTEGRATED COASTAL MANAGEMENT	• Wetland loss (and change)		Medium	Medium
13	POLDER CONSTRUCTION	• Rising water tables and impeded drainage		Medium	Medium
14	RELOCATION/ NEW HOME IMPROVEMENT	• Sea level rise, flooding, typhoons		High	Medium

 Population in low-elevation zones

 Dryland populations

 Farmers

COASTAL PROTECTION (SEA WALLS AND DIKES)

1

Create coastal sanctuaries to act as buffers to extreme climate-related events

ASSESSMENT High

		EFFECT		IMPLEMENTATION TIMEFRAME	
COST-EFFECTIVENESS	High	Immediate	✗	Quick Start	✗
CO-BENEFITS	High				
FEASIBILITY	Medium	Short-Term	✓	Implementation Lapse	Typically after 2-5 years
SCALABILITY	Very High				
EVIDENCE BASE	High	Long-Term	✓	Programme Cycle	5 years

Expense: $1 million +

Impacts Addressed: **Sea level rise, flooding, coastal erosion**

Coastal protection programmes rate highly on co-benefits and scalability. The programme benefits human health and food security and targets all groups regardless of income. In Mozambique, a five-year coastal management programme is expected to positively impact biodiversity, agriculture, and water supply and sanitation.

Programme descriptions are available through the UNFCCC NAPA database, and many training programmes exist. The programme is also cost-effective, with a cost-benefit ratio of 1.2 for sea walls and 1.4 for dikes. Implementation is relatively consistent and occurs over a two- to five-year timeframe.

Several implementation risks are associated with the programme, including extreme climatic events during the construction of protection barriers, loss of access to beaches, and a potential for tourism decline.

Many studies are available through UNEP, UNFCCC, and the World Bank. The programme could benefit from further quantitative assessment.

MDG BOOST ↑1, ↑4, ↑5, ↑6, ↑7

Sources: ECA Working Group (2009), NAPA, Mozambique (2008), Cazenave & Llovel (2010), NAPA, Benin (2008), NAPA, Cape Verde (2007)

BEACH NOURISHMENT

2

Beach stabilization, wetland rehabilitation, and extension of beaches to absorb storm surge.

ASSESSMENT High

		EFFECT		IMPLEMENTATION TIMEFRAME	
COST-EFFECTIVENESS	High	Immediate	✗	Quick Start	✗
CO-BENEFITS	High				
FEASIBILITY	Medium	Short-Term	✓	Implementation Lapse	Typically after 3 years
SCALABILITY	High				
EVIDENCE BASE	High	Long-Term	✓	Programme Cycle	Typically 5 years

Expense: $2 million +

Impacts Addressed: **Sea level rise, flooding, coastal erosion**

Beach nourishment programmes rate highly on cost-effectiveness, co-benefits and scalability. Although cost consistency is dependent on local cooperation and available resources, the cost-benefit ratio is 0.2, and implementation can occur in as little as three years.

Co-benefits include protection against erosion and sea level rise and are consistent where the programme is successfully implemented. The programme targets all groups regardless of income. In The Gambia, programmes to improve coastal defences are also expected to improve livelihood security and preserve biodiversity and ecological assets. For example, rehabilitation of the Kotu stream will prevent flooding of homes and restore rice cultivation.

Technical specifications and guidelines are readily accessible. Training programmes exist, and there are some well-documented case examples. Peer-reviewed studies are available from UNEP, UNFCCC and the World Bank. The programme could benefit from greater quantitative assessment and the development of more training programmes.

MDG BOOST ↑1, ↑7

Sources: ECA Working Group (2009), Nicholls et al. (2007), NAPA, Gambia (2008)

MANGROVE BARRIERS AND RESTORATION

3

Replanting mangrove forests in degraded areas to protect coastal areas from storms.

ASSESSMENT High

		EFFECT		IMPLEMENTATION TIMEFRAME	
COST-EFFECTIVENESS	High	Immediate	✗	Quick Start	✗
CO-BENEFITS	High				
FEASIBILITY	High	Short-Term	✗	Implementation Lapse	Typically after 2-4 years
SCALABILITY	High				
EVIDENCE BASE	Very High	Long-Term	✓	Programme Cycle	Typically 7 years

Expense: $1 million +

Impacts Addressed: **Sea level rise, flooding, coastal erosion**

Mangrove barrier and restoration programmes rate highly on cost-effectiveness, co-benefits, and feasibility. With a 0.0 cost-benefit ratio and an implementation timeframe of three years, the programme is highly cost-effective.

The programme ranks high in co-benefits, targeting all groups regardless of income. In Cambodia, a mangrove restoration programme will protect neighbouring areas from windstorm, seawater intrusion and coastal erosion; enhance biodiversity; and reduce poverty through increased job opportunities. Additionally, recent evidence has shown that mangrove forests reduce vulnerability to tsunami damage.

Although the programme receives a high rating for feasibility, it may encounter problems with land availability and conflicts over land use. Weak social capital in local communities is also a barrier, posing a potential risk to ongoing projects.

Programme specifications and guidelines are available through the UNFCCC NAPA database. NGOs and universities do offer training programmes, but they are not all accessible to the general public.

MDG BOOST ↑1, ↑7

Sources: ECA Working Group (2009), NAPA, Cambodia (2008), NAPA, Congo (2006), NAPA, Djibouti (2006), OXFAM/ Green Coast Nicholls et al. (2007), World Bank (2008)

"BACK-AWAY" ELEVATION

4

Restrict all new buildings to at least a four-meter elevation ("back away").

ASSESSMENT High

		EFFECT		IMPLEMENTATION TIMEFRAME	
COST-EFFECTIVENESS	High	Immediate	✗	Quick Start	✗
CO-BENEFITS	High				
FEASIBILITY	High	Short-Term	✗	Implementation Lapse	Typically within 1 year
SCALABILITY	Medium				
EVIDENCE BASE	High	Long-Term	✓	Programme Cycle	Varies

Expense: Unknown

Impacts Addressed: **Sea level rise, coastal erosion (direct and indirect)**

"Back-away" elevation programmes rate highly on cost-effectiveness, co-benefits, and feasibility. With a 0.0 cost-benefit ratio, and implementation possible within one year, the programme is highly cost-effective. In Samoa, cost-benefit analysis revealed that 54 percent of the damage expected to occur in 2030 during a 250-year coastal flooding event can be averted by a set of four cost-efficient adaptation measures, including elevation programmes. Co-benefits include the improvement of livelihoods, prevention of saltwater intrusion, and enhancement of fresh water quality.

Extreme weather conditions or local policy conflicts may impact the programme's success. In Samoa, implementation of a mandatory land-use plan could cause conflict between central authorities and local chiefs. Also, geographic variance, even at a local level, can make back-away elevation impossible in some areas.

Various peer-reviewed studies and qualitative assessments are available through the World Bank, UNFCCC and UNEP. The programme could benefit from additional case examples and more training programmes to better ascertain its broad effects.

MDG BOOST ↑7

Sources: ECA Working Group (2009), Nicholls et al. (2007)

SALTWATER INTRUSION BARRIERS

5

May include construction of irrigation wells, development of integrated watershed management programmes, construction of structures to conserve soil and water, groundwater monitoring, and capacity building to protect freshwater sources.

ASSESSMENT High

		EFFECT		IMPLEMENTATION TIMEFRAME	
COST-EFFECTIVENESS	Medium	Immediate	✗	Quick Start	✗
CO-BENEFITS	High				
FEASIBILITY	Medium	Short-Term	✗	Implementation Lapse	Typically after 3 years
SCALABILITY	Medium				
EVIDENCE BASE	Medium	Long-Term	✓	Programme Cycle	Typically 5 years

Expense: $5 million +

Impacts Addressed: **Sea level rise, saltwater intrusion**

Saltwater intrusion barrier programmes rate highly on co-benefits by improving livelihoods and fresh water quality and protecting coastal agriculture. In Eritrea, a groundwater-recharging project is also expected to improve wildlife habitats, food security, and health and nutrition, and to reduce poverty.

Programme costs are initially high, with results in the long term. Consistency of costs depends on available funds and local capacity. The feasibility of the programme may be hindered by a lack of existing national legislation on the proper use of groundwater, delays, budget shortages, and/or extreme weather conditions. The programme's success depends on commitment at both the community and policy-making level.

Various peer-reviewed studies and detailed qualitative assessments are available through the World Bank, UNFCCC and UNEP. The programme could benefit from more accessible technical specifications and guidelines and from additional training resources.

MDG BOOST ↑1, ↑7

Sources: ECA Working Group (2009), Nicholls et al. (2007), NAPA, Eritrea (2007)

LAND USE PLANNING

6

Land use planning is the term given to public policy that directs how land in a community is used, while balancing the needs of the people who live in the area with the environment. It involves studies and mapping, multi-stakeholder dialogue, and formulation of alternative land-use decisions.

ASSESSMENT High

		EFFECT		IMPLEMENTATION TIMEFRAME	
COST-EFFECTIVENESS	Medium	Immediate	✗	Quick Start	✗
CO-BENEFITS	Very High				
FEASIBILITY	Medium	Short-Term	✗	Implementation Lapse	Typically after 3 years
SCALABILITY	High				
EVIDENCE BASE	Medium	Long-Term	✓	Programme Cycle	Typically 5 years

Expense: $1 million +

Impacts Addressed: **Sea level rise, rising water levels**

Land use planning programmes rate highly on co-benefits and scalability. The programme targets all groups, regardless of income, and serves to improve biodiversity and food security. In Cuba, national land use planning and management are integrated with disaster risk reduction, contributing significantly to the management of fragile coastal areas. High-risk coastal settlements were identified by producing hazard and vulnerability maps, and land-use regulations for retrofitting, resettlement, and urban growth were developed.

The programme has many strong, well-documented case examples. Technical specifications and guidelines are widely accessible. The programme is relevant to low-income countries and mega-cities in medium-income countries.

Costs for the programme are high, and there is no clear cost-benefit ratio. Long-term implementation is necessary before effects can be seen. Feasibility is highly dependent on the political context. The process often involves competing interests and values, so a high level of cross-sector cooperation is essential. Lack of funds and technical capacity can also hinder programme implementation.

Various peer-reviewed studies and detailed qualitative assessments are available through the UNFCCC and UNISDR. The programme could benefit from additional training resources and quantitative assessment of the programme's impact.

MDG BOOST ↑1, ↑7

Sources: ECA Working Group (2009), UNISDR (2007), NAPA, Ethiopia (2008), Nicholls et al. (2007)

DRAINAGE SYSTEMS UPGRADE

7

Increase capacity of existing drainage systems to handle more frequent storms, increased rainfall, and rising sea level.

ASSESSMENT High

		EFFECT		IMPLEMENTATION TIMEFRAME	
COST-EFFECTIVENESS	Very High	Immediate	✗	Quick Start	✗
CO-BENEFITS	High				
FEASIBILITY	Medium	Short-Term	✗	Implementation Lapse	Typically within 1-2 years
SCALABILITY	Medium				
EVIDENCE BASE	High	Long-Term	✓	Programme Cycle	Typically 5 years

Expense: $20-$50 million

Impacts Addressed: **Rising water levels and impeded drainage**

Drainage system upgrade programmes rate highly on cost-effectiveness and co-benefits. The cost-benefit ratio is 0.33 for drainage system maintenance and 0.29 for drainage system upgrade projects. Implementation is possible within a year. However, depending on the magnitude of the project, a one-two year implementation timeline is also possible. The programme targets all groups and may reduce the prevalence of diarrhea, malaria, waterborne diseases and malnutrition, although more research is needed in this area.

In Bolivia, expansion of sewerage networks into low-income areas and construction of new wells is expected to have significant positive impacts on public health by improving access to clean water.

The programme's feasibility may be threatened by a lack of external funding and a lack of cooperation on local and policy-making levels. Also, extreme weather conditions may postpone or even destroy existing projects.

The programme is relevant to middle and high-income countries in addition to low-income countries. The World Bank, UNFCCC, and UNEP have published studies on such programmes, and robust quantitative assessments have been performed for some projects. However, few examples of technical specifications and guidelines exist, and training resources are scarce.

MDG BOOST ↑1, ↑4, ↑5, ↑6, ↑7

Sources: ECA Working Group (2009), World Bank (2005), GEF (2010)

CONSERVATION AND RESTORATION

8

Reforesting, replanting, restoration, and rehabilitation of existing woodlots in degraded areas using native, drought-resistant forest species.

ASSESSMENT High

		EFFECT		IMPLEMENTATION TIMEFRAME	
COST-EFFECTIVENESS	Medium	Immediate	✗	Quick Start	✗
CO-BENEFITS	Very High				
FEASIBILITY	High	Short-Term	✗	Implementation Lapse	Typically after 2-3 years
SCALABILITY	Very High				
EVIDENCE BASE	Medium	Long-Term	✓	Programme Cycle	Typically 4 years

Expense: $500,000

Impacts Addressed: **Desertification**

Conservation and restoration programmes rate highly on co-benefits, scalability, and feasibility. Co-benefits include improvements in biodiversity, human health, and food security. In Burundi, the long-term results expected from the program include reconstruction of hydrological and weather-regulation systems and increased agricultural production.

The programme is very relevant to low-income countries and has many well-documented case examples. For example, the "Conservation and Rehabilitation of African Lands" programme recognizes the importance of vegetative conservation and restoration and prioritizes actions for managing forest resources and rehabilitating plants to control desertification.

The programme shows consistent results where implemented. As the project involves several sectors, feasibility is highly dependent on strong coordination between local partners. Also, poverty may drive local populations to clear restored forest areas.

Further information is needed to determine the programme's cost-effectiveness.

Several high-profile empirical studies have been done. Although there is already relatively high recognition at the policy-making level, the programme warrants increased attention in the future.

MDG BOOST ↑1, ↑7

Sources: UNCCD (2004), NAPA, Rwanda (2007), NAPA, Burundi (2007), Waithaka et al. (2010)

SOIL CONSERVATION

9

Conserve soil by building infiltration ditches around homes, planting grass cover, using terrace farming, digging trenches to divert runoff, mulching, and tree planting. Such projects reduce the vulnerability of regions affected by erosion and floods.

ASSESSMENT High

		EFFECT		IMPLEMENTATION TIMEFRAME	
COST-EFFECTIVENESS	High	Immediate	✗	Quick Start	✗
CO-BENEFITS	High				
FEASIBILITY	Medium	Short-Term	✗	Implementation Lapse	Typically after 4-5 years
SCALABILITY	Medium				
EVIDENCE BASE	Very High	Long-Term	✓	Programme Cycle	Typically 8-9 years

Expense: $1 million +

Impacts Addressed: **Desertification**

Soil conservation programmes rate highly on cost-effectiveness and co-benefits.

The cost-benefit ratio of the project is -0.2. Co-benefits include improvement of infrastructure and protection against floods. In Rwanda, the programme is also expected to stem migration of populations in search of suitable land for agriculture.

The programme is highly relevant to low-income countries. Awareness programs, education, and training in resource use addressed to farmers, local offices, and ministries of agriculture have been developed. A few well-documented case examples from Sub-Saharan Africa exist.

The amount of funding and technical expertise available may affect the programme's feasibility. Also, land policy, actual land occupancy, and complex farming practices may hinder implementation. Several high-profile empirical studies are available, and there is relatively high recognition for the programme, but more attention is needed in the future.

MDG BOOST ↑1, ↑7

Sources: ECA Working Group (2009), NAPA, Burundi (2007), NAPA, Rwanda (2007), Waithaka et al. (2010)

FORESTATION

10

Establishing forests, naturally or artificially, on areas that may or may not previously have been forested.

ASSESSMENT Very High

		EFFECT		IMPLEMENTATION TIMEFRAME	
COST-EFFECTIVENESS	High	Immediate	✗	Quick Start	✗
CO-BENEFITS	Very High				
FEASIBILITY	High	Short-Term	✗	Implementation Lapse	Typically within 3 years
SCALABILITY	Very High				
EVIDENCE BASE	High	Long-Term	✓	Programme Cycle	Typically 5 years

Expense: $5 million

Impacts Addressed: **Desertification**

Forestation programmes have a wide range of co-benefits, are easy to scale up, and are cost-effective and feasible. The programme also positively impacts agriculture, food security, and desertification. In Uganda, where forestry contributes to economic development and general well-being, increased employment opportunities are expected to be a significant by-product of forestation.

UNCCD's globally launched Thematic Programme Networks (TPNs) provide extensive technical specifications and guidelines. Also, the "Mediterranean Forest Action Programme" (MED-FAP) intends to address the main problems related to sustainable management of plant formations and the promotion of forestry in controlling desertification in the Mediterranean region.

The cost-benefit ratio is between 0 and 1 for medium-income households. Results will only occur in the long term, as the project requires tree growth. Project costs will vary based on geography. Forest plantations in arid and semi-arid zones may have few beneficial effects unless they are closely related to the needs and priorities of the local population. So it is important to integrate forestation into farming systems not only for the purpose of growing trees but also to improve the welfare of rural families.

Successful implementation can be undermined by insufficient funding and limited knowledge as well as by natural hazards, pests, and civil conflicts.

MDG BOOST ↑1, ↑7

Sources: NAPA, Rwanda (2007), Waithaka et al. (2010), Dahal (2006) , NAPA, Burundi (2007), UNCCD & Joint Liaison Group of the Rio Conventions (2007), NAPA, Uganda (2007), UNCCD (2004)

Very low | Low | Medium | High | Very high

ENHANCED LIVESTOCK MANAGEMENT

11

Enhance the ability of livestock production systems to adapt to changing climatic conditions, such as drought and strong inter-annual precipitation

ASSESSMENT Medium

		EFFECT		IMPLEMENTATION TIMEFRAME	
COST-EFFECTIVENESS	Medium	Immediate	✗	Quick Start	✗
CO-BENEFITS	Very High				
FEASIBILITY	Medium	Short-Term	✓	Implementation Lapse	Typically after 3 years
SCALABILITY	Medium				
EVIDENCE BASE	Low	Long-Term	✓	Programme Cycle	Typically 4 years

Expense: $5 million+

Impacts Addressed: **Desertification**

Enhanced livestock management programmes rate highly for co-benefits. This programme is applicable to all groups, regardless of income, and enhances biodiversity and food security. In Uganda, a drought adaptation project includes promotion of a suitable, community-led livestock and animal-products marketing system. In the long-term, the project is intended to restore household food security, improve the quality of food consumed, and increase household income.

The programme requires close cooperation between farmers and local agencies. Potential barriers to this programme include inadequate funding and insufficient community participation. In Eritrea, programme challenges have included limited access to technical know-how at the local level and little ability to increase livestock production through best use of available resources.

The programme is highly relevant in low-income countries. Training programmes exist through UNDP country offices and local NGOs. The cost-effectiveness of the programme has not been determined. However, the programme could benefit from additional case studies and cost-benefit analyses.

MDG BOOST ↑1, ↑7

Sources: LDCF/NAPA (2007-2009), NAPA, Eritrea (2008), Waithaka et al. (2010), UNFCCC, LDC Expert Group, GEF (2009)

INTEGRATED COASTAL MANAGEMENT

12

Increase the resistance capacity of coastal zones through integrated management of coastal resources. Includes experimenting with a variety of construction materials, alternative means of construction, local early warning systems, and training.

ASSESSMENT High

		EFFECT		IMPLEMENTATION TIMEFRAME	
COST-EFFECTIVENESS	Medium	Immediate	✗	Quick Start	✗
CO-BENEFITS	High				
FEASIBILITY	Medium	Short-Term	✗	Implementation Lapse	Typically after 5 years
SCALABILITY	High				
EVIDENCE BASE	Medium	Long-Term	✓	Programme Cycle	Varies

Expense: $1 million +

Impacts Addressed: **Sea level rise, wetland loss (and change)**

Integrated coastal management programmes rate highly on co-benefits and scalability.

Co-benefits include improved ecosystems, infrastructure, and economic activities. People are also less likely to be displaced from their communities. An integrated management programme in Cape Verde will also support economic development by supporting tourism infrastructure located in coastal areas.

The programme is especially relevant to small island nations. Technical specifications and guidelines are generally available through the implementation programme. Training programmes and information are available through the NAPA project "Adaptation to Climate and Coastal Change in West Africa".

The cost-effectiveness of the programme has not yet been clearly determined. The programme may be unfeasible due to a lack of external funding, which is critical to implementation. Also, extreme weather conditions may postpone or hinder the implementation process. Peer-reviewed studies and detailed qualitative assessments are available through UNFCCC.

MDG BOOST ↑1, ↑7

Sources: NAPA, Cape Verde (2007), Nicholls et al. (2007)

POLDER CONSTRUCTION

13

Construction of small or large polders to prevent the water table within the polder from rising too high.

ASSESSMENT High

		EFFECT		IMPLEMENTATION TIMEFRAME	
COST-EFFECTIVENESS	High	Immediate	✗	Quick Start	✗
CO-BENEFITS	High				
FEASIBILITY	Medium	Short-Term	✗	Implementation Lapse	Typically after 3 years
SCALABILITY	High				
EVIDENCE BASE	Medium	Long-Term	✓	Programme Cycle	Typically 8 years

Expense: $1 million +

Impacts Addressed: **Rising water tables, Coastal inundation**

Polder construction programmes rate highly on cost-effectiveness, co-benefits and scalability. The project is considered cost-effective and usually has a three-year implementation timeframe. In addition to reducing flooding, polder restoration projects improve and restore biodiversity and human health and increase agricultural production.

Few technical guidelines are available for this programme. Training programmes, however, are available through IPCC and Caritas International. Roadblocks to successful programme implementation include a lack of awareness at the community and policy-making level and a lack of technical assistance and tools. The programme is also sensitive to weather changes, such as extreme sea level rise or flooding. In Bangladesh, drainage congestion due to sea level rise and inundation has been identified as a threat to polder performance.

Peer-reviewed studies and detailed qualitative assessments are available through IPCC. The programme could benefit from further cost-benefit analyses and increased awareness as well as momentum to implement the programme in local and national planning projects.

MDG BOOST ↑1, ↑7

Sources: Mohal, Kahn & Rahman (2007), NAPA, Bangladesh (2005)

RELOCATION/NEW HOME IMPROVEMENT AND ELEVATION

14

Elevating new homes on concrete piles, securing roofs with metal straps and nails, or relocating highest-risk homes to safer locations.

ASSESSMENT High

		EFFECT		IMPLEMENTATION TIMEFRAME	
COST-EFFECTIVENESS	High	Immediate	✗	Quick Start	✗
CO-BENEFITS	High				
FEASIBILITY	Medium	Short-Term	✗	Implementation Lapse	Typically after 1 year
SCALABILITY	Medium				
EVIDENCE BASE	Medium	Long-Term	✓	Programme Cycle	Varies

Expense: $500,000

Impacts Addressed: **Sea-level rise, flooding, typhoons**

Programmes that target relocation/improvement and elevation of homes rate highly on cost-effectiveness and co-benefits. Implementation is possible within one year, and benefits are long-term. The cost-benefit ratio for elevating new homes is 0.33, while elevating prioritized homes for retrofitting is 2.77. Co-benefits include the improvement of human health and socio-economic conditions due to a safer environment and lower risk of losing homes and/or livestock.

Successful implementation hinges on awareness at the community and policy-making level. In cases of extreme flooding, there is a risk that elevated homes may still be risk-prone.

Peer-reviewed studies are available through UNFCCC; however, the programme would benefit from additional case studies and quantitative assessment. Further studies would also serve to heighten awareness of the programme among policy makers.

MDG BOOST ↑1, ↑7

Sources: ECA Working Group (2009), NAPA, Eritrea (2007), NAPA, Sao Tome e Principe (2008)