IFAD SUBMISSION to NWP IN THE AREA OF ECOSYSTEMS, INTERRELATED AREAS SUCH AS WATER RESOURCES, AND ADAPTATION

Part 1: Adaptation planning processes addressing ecosystems and interrelated areas such as water resources

- Description of relevant activities and collaborating partner institution/s (if any)
  Following information comes from the IFAD publication The Drylands Advantage from the Environment and Climate Division of IFAD and in collaboration with The Adaptation for Smallholder Agriculture Programme (ASAP).
- Key results
  - The work IFAD does has shown that human development and a focus on the environment in drylands do not need to be in conflict. IFAD's work in drylands contributes to multiple SDGs related to alleviating poverty and empowering women and men, the climate and the environment. These "multiple benefits", contribute to multiple SDGs and include:
    - Improved food security and nutrition outcomes
    - Increased income for households and communities
    - Better access to land for smallholders
    - More awareness and understanding of sustainable agriculture approaches appropriate to drylands through local capacity development as well as research
    - Valuing indigenous knowledge of drylands and protecting indigenous peoples living on them
    - Empowerment of women
    - Stronger policy, governance and institutions
    - Greater resilience to climate change

- Description of lessons learned and good practices
  - **IFAD's role in supporting dryland ecosystems and smallholder livelihoods**

    In 2012, the Environment Management Group (EMG) of the United Nations called for more attention to drylands, and today, many more development partners are putting the drylands at the heart of the work. The International Fund for Agricultural Development (IFAD) has long championed investing in drylands to improve both

productivity and social outcomes while managing the development footprint on the environment. For example, in Africa, where drylands are particularly fragile, IFAD has invested approximately US$3 billion since 2000 in initiatives related to the objectives of the UNCCD. IFAD is also proud to have contributed to the initial phases of global action. Currently, many investments of IFAD's Adaptation for Smallholder Agriculture Programme, as well as many of its regular loans and grants, are focused on the world's drylands. Recently, IFAD has also taken up the challenge of estimating mitigation co-benefits of its adaptation investments, many of which are in drylands; this will enable IFAD to understand how it is supporting countries to meet national targets to cut emissions in line with the Paris Agreement at the 21st Conference of the Parties (COP21).

IFAD also leads the GEF Integrated Approach for Food Security in Sub-Saharan Africa, which focuses on the natural resources — land, water, soils, trees and genetic resources — that underpin food and nutrition security.

Twelve African countries participate in the programme. These countries are located in dryland regions, which face the greatest threat of environmental degradation on small farms.

- **IFAD's approach in drylands**

Having funded projects in drylands for over three decades, IFAD has developed a flexible portfolio of approaches and technologies to support human and environmental benefits. Wherever possible, IFAD supports countries to achieve Rio Convention synergies in drylands. With regard to people, IFAD has always believed in smallholder-driven rural development, and this holds true of its experience in drylands. Techniques such as "farmer-managed natural regeneration", participatory mapping of natural resources leading to "talking maps" and community-based natural resource management are examples of how IFAD has been working with smallholders to restore degraded lands and agricultural productivity. IFAD seeks to build on smallholders' and indigenous knowledge and blend this with new technologies, such as in developing drought-tolerant plants. In terms of climate change, which threatens to further aggravate land degradation, IFAD's approach has involved improving the coping capacities of poor rural communities through agroforestry, soil and water management, crop management, livestock production systems and livelihood diversification, among other techniques. In addition, practical water related approaches with multiple benefits applied by IFAD include rainwater harvesting, floodplain restoration, modern and efficient irrigation systems, improved water storage, and reuse of wastewater.

- **Multiple benefits for drylands and their peoples**

Over the years, IFAD and its partners have seen some important achievements. For example, IFAD has contributed to the re-greening of the Sahel region of Africa; in the Central Plateau of Burkina Faso alone, up to 300,000 hectares (ha) were rehabilitated. In Niger, deforestation had led to the loss of fertile soil and, present

for 30 years, IFAD's project in the Department of Aguié regenerated 100,000 ha by protecting land from overgrazing and deforestation and replanting trees. Where before it was barren, now there are about 50 new trees per hectare. Similarly, in the Syrian Steppe, 10 million ha of land are severely degraded; IFAD has managed to restore vegetation to approximately one third of the rangelands through close cooperation with local herders and farmers. Through combinations of resting land, limiting grazing, reseeding, planting shrubs, promoting indigenous species, improved irrigation and soil banks, IFAD has halted desertification and reclaimed over a million hectares of land. In the Caatinga Forest of Brazil, extended yearly droughts have devastated the landscape for years. IFAD's work with local communities here has turned what was once a monochrome harsh landscape into an oasis with water tanks and irrigation schemes keeping the land fruitful and ensuring that the families relying on the land are fed. The case studies from China, Jordan, Nicaragua, Senegal and Swaziland below present some further examples in more detail.

- Description of key challenges – Examples from IFAD projects
  - China
    - Dryland areas in the west of China cover about 40 per cent of the country's total land area and are very vulnerable to drought and desertification. About 27 per cent of the country is now affected by some of the most severe land degradation in the world, creating livelihood risks and vulnerability for several hundred million people and around 20 per cent of the world's population. Alarmingly, the area of degraded lands is expanding at a rate of about 3,500 km2 a year due to a combination of unsustainable agricultural practices, deforestation and mismanagement of water resources.
  - Jordan
    - The scarcity of water resources, even for supplementary irrigation, small and fragmented landholdings that cannot support an average family, and dwindling productivity: these are some of the challenges facing farmers relying on rainfed agriculture in Jordan's Southern Highlands region. Forced to buy water for irrigation, smallholders resorted to reducing their plantation size or even abandoning agriculture. Added to these challenges, smallholders have limited access to technical and financial support for both agricultural and non-agricultural activities. It is easy to see why smallholders lacked the motivation to invest in meagre improvements in productivity, as they found themselves trapped in a cycle of escalating poverty as land degradation was compounded by climate change.
  - Nicaragua
    - Nicaragua is a country of great lakes, rivers and biodiversity, yet its location in Central America's "Dry Corridor", a semi-arid region, makes it highly vulnerable to extreme weather events. Agriculture generates 31 per cent of employment and 32 per cent of total exports of primary products. Furthermore, it is the main source of income for 80 per cent of the rural

population. In recent years, production has been affected by the effects of El Niño and climate variability, and change within an already fragile context of environmental degradation and depleted water resources exacerbated by the phenomenon of change and climate variability. There have been recurrent droughts, which affect almost 45 per cent of the population; in 2014 and 2015, two consecutive droughts wrought devastating losses for smallholders. According to FAO initial estimates last year, half the total planted areas were damaged, with total crop losses in the country's most severely affected regions.14 This has severely impacted family farmers, who form the overwhelming majority of the producers, and of whom around 40 per cent are subsistence farmers and depend on their crops to live.

- Senegal
    - Senegal is on the westernmost part of the bulge of Africa and includes desert in the north. About 75 per cent of Senegal's population is rural. Senegal faces a persistent lack of rain due to its location in the Sahel-Saharan climatic zone. In recent decades, human activities such as monoculture farming, bush fires, inappropriate or lack of fertilization and overgrazing have degraded the natural environment. This has resulted in lower production from crop and pasture lands, and an ongoing process of desertification. Declining soil productivity has prompted people to respond by clearing forests. Indeed, Senegal's forests are disappearing at an alarming rate, in the range of 40,000 hectares per year, as indicated by the FAO Global Forest Resources Assessment of 2010. Therefore, conservation of natural resources and ecosystems is a major priority and challenge. The effects of desertification and drought have also resulted in migratory flows and massive concentrations of people along Senegal's coastal areas, as they abandon most of the land lying in the interior. Senegalese coastal areas are also vulnerable to sea level rise, which causes widespread erosion and coastal flooding in low-lying coastal areas, in particular, mangrove estuaries. Salinization increasingly affects soils, surface waters and groundwater. All this has led to falling agricultural productivity. For example, the "groundnut basin" of Senegal, falling within the area covered by IFAD's "Agricultural Value Chains Support Project", suffers from land degradation – salinization, loss of biodiversity, loss of organic matter, erosion, etc. Water availability and rainfall is decreasing, evidenced by barely filled water ponds and isohyets slipping southwards. Rising temperatures linked to climate change means that water for farming and life is ever more precious. This degradation has drastically reduced the incomes of rural people, which, combined with the lack of alternative sources of income and basic infrastructure, is set to worsen rural poverty as climate change makes matters worse.
- Swaziland
    - Swaziland may be small in size, but it contains big variations in climate and landscape, with landforms embracing plateaus, hills and mountains, as well

as footslopes and plains. Out of six agroecological zones, one of them, the southern lowveld is experiencing severe food insecurity in 2016 after four years of drought. The southern lowveld, in particular, also has the lowest annual rainfall in Swaziland, and rainfall patterns are highly unpredictable. Increasing human and animal pressures have led to intensification of land use, and people are increasingly adopting unsustainable practices across semi-arid Swaziland. The main land use is extensive grazing; communal grazing and commercial ranching predominate, extending over three quarters of the country. Under the local system, each homestead can graze as many cattle as it can afford to buy – the result is overgrazing and land degradation, including changes in ecosystems, loss of biodiversity, decreases in water quality and availability. Overgrazing also removes too much of the soil's protective vegetal cover, and trampling by livestock compacts the soil so that it can hold less water. This increased run-off produces gullies in the land. Dwindling yields from arable cultivation and livestock lead to hunger and poverty.

- Planned next steps (as appropriate)
    - Today, drylands are deservedly attracting more support from many development partners, and IFAD does not work alone, but through strategic partnerships such as with the GEF, which currently contributes significantly to tackling land degradation. IFAD is proud to be the Lead Agency for the Sustainable and Resilient Food Security in Sub-Saharan Africa "Integrated Approach Program" (IAP). This GEF initiative targets agroecological systems where the need to enhance food security is linked directly to opportunities for generating global environmental benefits, and 12 countries will be supported (Burkina Faso, Burundi, Ethiopia, Ghana, Kenya, Malawi, Niger, Nigeria, Senegal, Swaziland, Tanzania and Uganda). Similarly, IFAD's Adaptation for Smallholder Agriculture Programme (ASAP) will continue its work to boost resilience and natural resource management in drylands, channelling financing from a range of donors to match that of national governments, the private sector and smallholders themselves. IFAD, for its part, will continue to invest in and advocate for drylands – their ecosystems and their people.

Part 2: Monitoring and evaluating the implementation of ecosystem-based adaptation

- Description of relevant activities and collaborating partner institution/s (if any)
    - As explained above, IFAD works through strategic partnerships such as with the GEF. In the joint Sustainable and Resilient Food Security in Sub-Saharan Africa "Integrated Approach Program" (IAP), a number of monitoring tools will be used that include:
      - The GEF Tracking Tools
      - ICRAF's Land Degradation Surveillance Framework (LDSF)
      - Bioversity International's Diversity Assessment Tool for Agrobiodiversity and Resilience (DATAR)

    - In addition, some indicators that are relevant for ecosystem-based adaptation are also used in the IFAD's Result and Impact Management System (RIMS). In the ASAP Porgramme results framework, a specific indicator measures the " % extent of lands and ecosystem degradation in productive landscapes"

Part 3: Tools for assessing the benefits of mitigation and adaptation to enhancing resilience and emissions reductions that ecosystem-based adaptation provides

IFAD, together with CCAFS, has done an assessment of the economic benefits deriving from the adoption of adaptation practices in the ASAP programme. Results show that Globally there is a strong economic case to invest in agriculture for future food security and rural livelihoods under climate change.
For example, IFAD's ASAP, will deliver global positive returns to investment across a range of climatic futures if adoption rates are high.

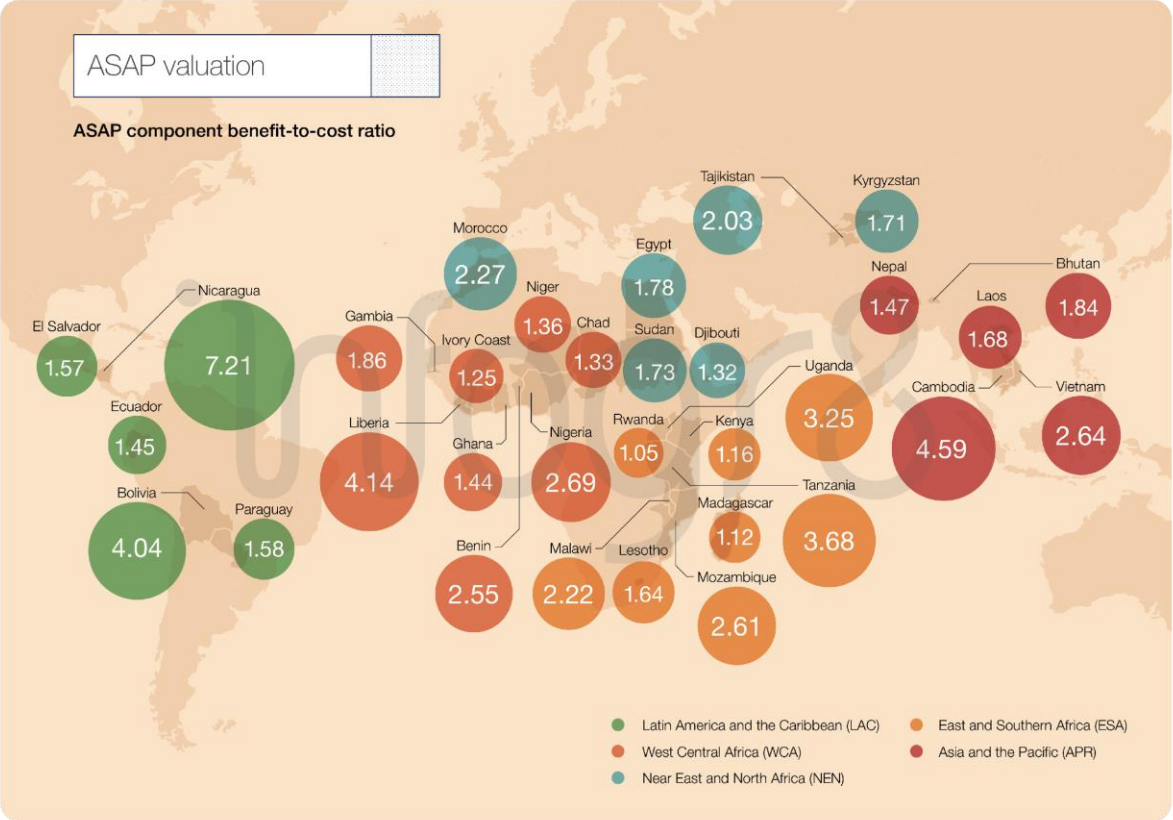
Agriculture is the major employer and accounts for more than 30% of GDP in low-income countries (WDI 2014 data) and is among the most sensitive sectors to climate change. Meta-analysis presented in the most recent IPCC report provides evidence that climate change without adaptation will have negative impacts on the yields of the major staple crops at local temperature increases of 2°C or more above 1990s levels; tropical regions are likely to experience stronger yield declines than temperate regions. Combined with future challenges of population growth, demographic transitions and conservation of ecosystem services, climate change puts future food security and rural prosperity at stake.

The good news is that farmers, governments, researchers and businesses already have strong capacity and knowledge to implement appropriate near-term measures and longer-term transformative changes to agriculture and food systems in response to climate change.

The International Fund for Agricultural Development's Adaptation for Smallholder Agriculture Programme (ASAP) is both the largest global financing source for smallholder adaptation and a trailblazer that can offer useful lessons to emerging climate finance mechanisms at national, regional and global levels. ASAP works in over 30 low-income and middle-income countries, using climate finance to make rural development programmes more climate-resilient. Much of the finance goes to farmers themselves and to farmer-led adaptation, through financing of, and decision-making by, local farmer organisations and community organisations.

Ex ante economic analysis shows that a representative project among the 32 country-level ASAP investments approved since 2010 generate and redistribute net worth USD 0.44 to USD 1.63 for every dollar invested through ASAP, to smallholder farmers and other project beneficiaries over a timeframe of twenty years. Each project, whose implementation lasts between five and seven years, will completely offset its costs and contribute to value generation of USD 350,000 per year, generating a mean net present value of USD 6.8 million. Benefit-to-cost ratios are positive in all target countries, and reach values of over 4:1 in Cambodia, Liberia, Bolivia and Nicaragua (Diagram 3).

Diagram 3. Benefit-cost ratios of ASAP investments in 32 countries



The analyses are ex-ante and will be confirmed by ex-post analyses during monitoring and evaluation of project performance. The projected income generation assumes an average implementation rate for projects of 65% or more, which may be a generous assumption. Results are intended as best-case scenarios for future outcomes from the set of ASAP investments, to provide an accountability system to donors and internal learning for ASAP. IFAD system for ex-post analysis and evaluation of project impacts will be used to assess ASAP performance during the project (Mid-Term Review) and at completion (Project Completion Report).

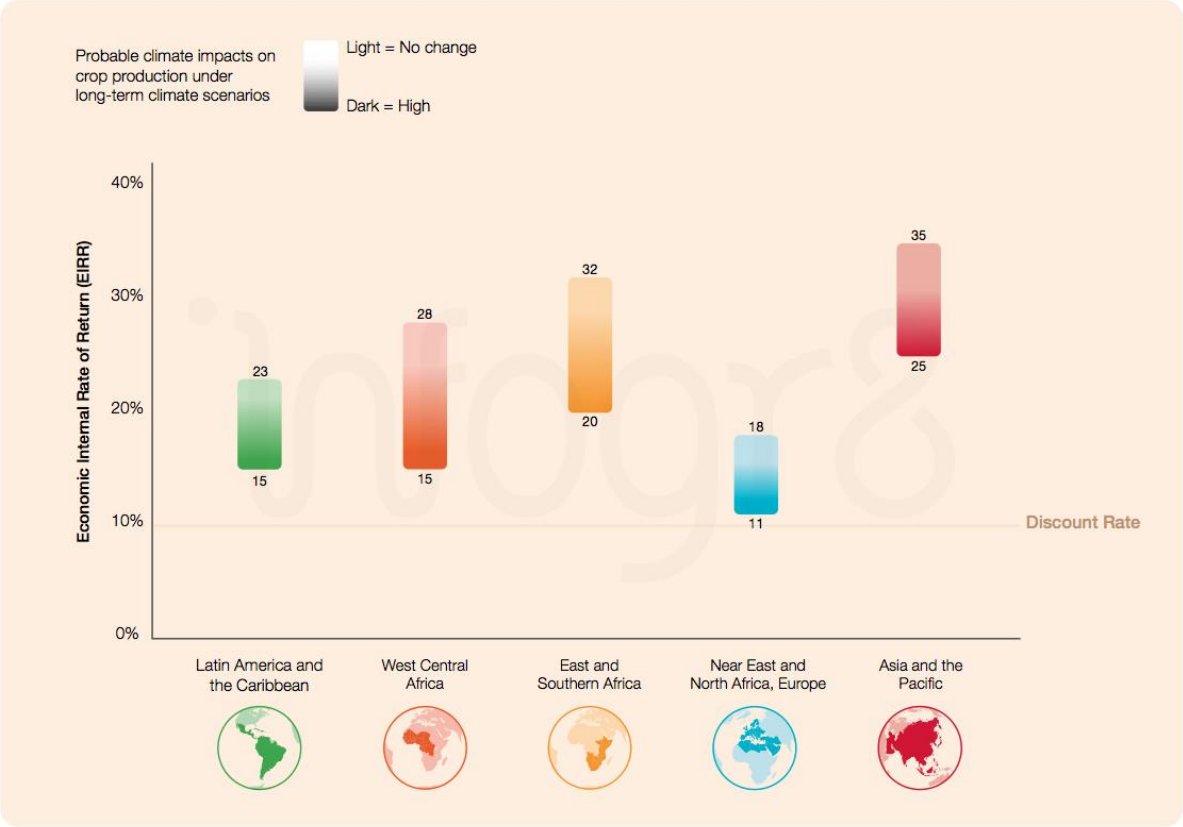
Project activities and costs include: institution building and capacity building, particularly at the local level and including support to market development; technical interventions and infrastructure, such as building bunds and improving resilience of post-harvest storage infrastructure to heat, wind and rain; services (financial, information, extension, research); management and delivery of finance; policy and legal frameworks; and program management, particularly monitoring and evaluation. These are all additional climate change investments over and above the main investments of the country loan for agricultural development, though they may often deliver low-regrets options, such as erosion control, and broad-based development benefits, such as development of farmers' associations, rather than being tailored to very specific climate risks.

On average the socio-economic benefits generated by the implementation of such interventions correspond to 6% increase in the economic wellbeing of the direct beneficiaries in the target areas. The ASAP programme contributes 3% to 10% of the total GDP generated over 20 years. This translates to GDP growth contribution at the national level over a 20 year timeframe of up to 0.68% annually. The cumulative net wealth creation globally is USD 274 million, compared to USD 200 million distributed as grants.

Environmental benefits – such as biodiversity conservation, soil and water conservation and carbon sequestration – provide an additional benefit over and above the direct socio-economic benefits. The added economic benefits range from 10-25% additional benefit in countries such as Ghana, Madagascar and Bolivia, through to a more than doubling of the total economic benefit in Djibouti.

The analysis also shows that returns to ASAP are robust across a set of climatic futures (Diagram 4). At the higher end of climate change impacts, losses to crop yields are estimated at 27% to 40% below expected mean values without climate change (at the lower end). All countries presented an economic return of project investments greater than the opportunity costs of capital set by the discount rate at 10%. In this analysis, the West Central Africa region shows highest variability under climate change, while the Near East and North Africa region is closest to losing net benefits from interventions under progressive climate change.

Diagram 4. Rate of return of ASAP investments across lower and higher climate impacts in five regions



- Partner institution/s (if any)
    - Research programme on Climate Change, Agriculture and Food Security CGIAR CCAFS https://ccafs.cgiar.org/

- Key results if the tool has been tested and challenges (as appropriate)
    - Key results:

- Evidence of actions in agriculture that have a high likelihood of delivering meaningful economic and financial returns under climate change has been shown for global, national, project and farm levels.
- The ingredients of a strong economic assessment for NDCs and other climate change plans for agriculture include policy mainstreaming, iterative planning, a balance of project-level and farm-level assessment of costs and benefits, and appraisal of economic incentives and the enabling environment for farmers and other private-sector actors. NDCs are generally well aligned with national development plans so that proposed actions for both adaptation and mitigation contribute to improved development outcomes, but they do not yet collectively meet global ambitions of the Paris Agreement.
- The more ambitious NDCs provide the political capital to promote transformative actions that bring together multiple longer-term agendas for social, economic and environmental benefit.

This report has presented evidence of actions in agriculture that have a high likelihood of delivering meaningful returns under climate change, from an economic and financial perspective. At the global level, the economic case can be made through several examples of positive returns for future food security and rural livelihoods under climate change. At the farm level, positive economic returns can be demonstrated for multiple practices that build adaptive capacity and reduce emissions intensity across several of the priority subsectors highlighted in the NDCs – soil and land, water crops, livestock, fisheries and trees. Evidence is emerging that combining these actions into portfolios linked to institutional support, such as extension, research and value-chain development, will deliver the best economic returns over time. Understanding and influencing the behaviours of farmers and other private-sector actors will be critical to success.

Building on the economic evidence available has the potential to generate new credible proposals that could then drive large-scale public and private investment in agriculture under climate change. The credibility of these proposals will depend on better-quality economic assessments.