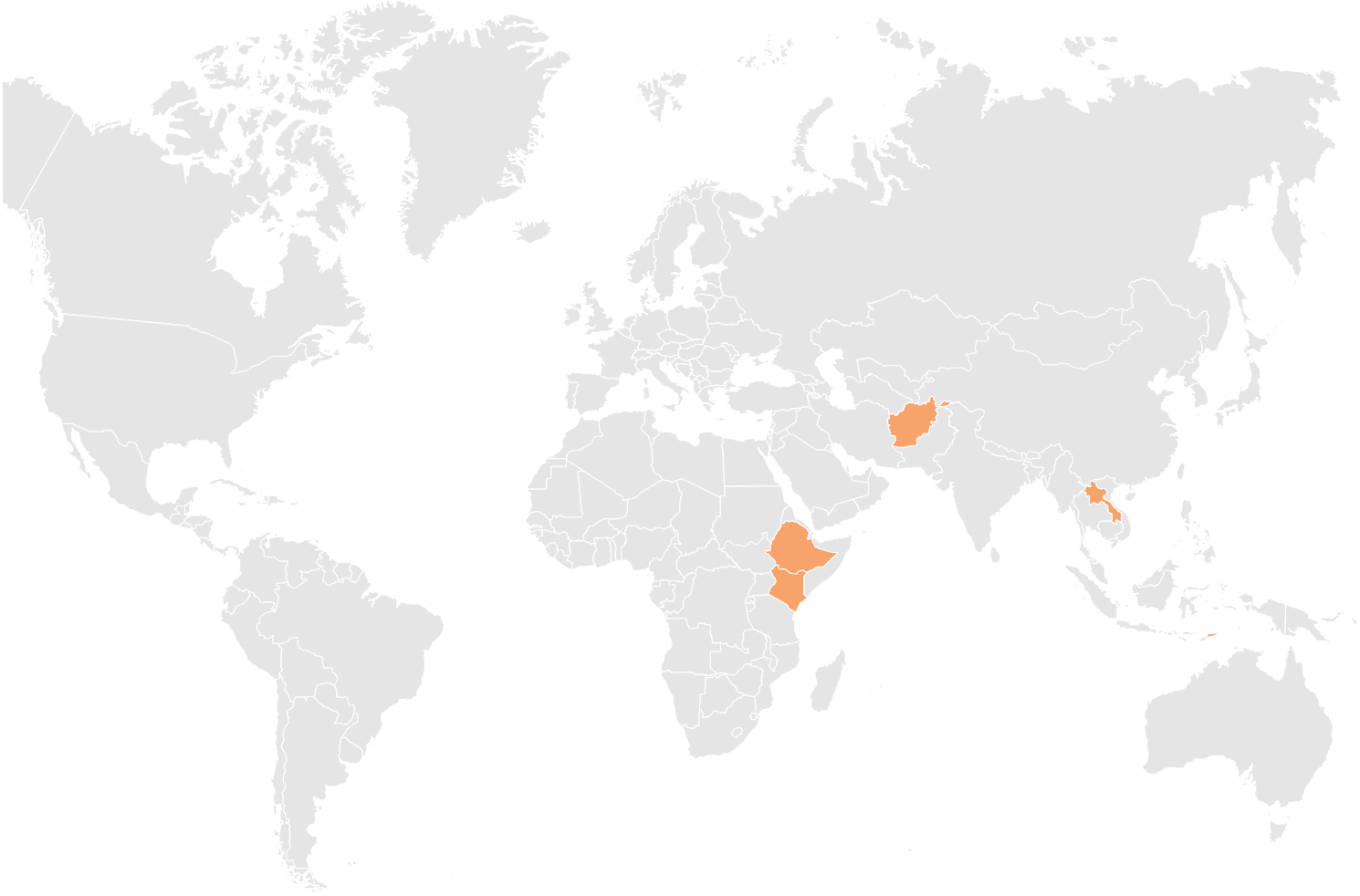
UTS Institute for Sustainable Futures

World Vision

CLIMATE-SMART AGRICULTURE IN WORLD VISION AUSTRALIA'S PROGRAMMING

Strategic Brief | April 2023

THIS MEANS THE WORLD



Acknowledgments

This brief summarizes the results from a strategic review of climate-smart agriculture in World Vision Australia's Agriculture Development Programming conducted from April to November 2022.

World Vision Australia (WVA) commissioned the University of Technology Sydney (UTS) Institute of Sustainable Futures to perform this strategic review. Analysis was conducted by Dr Federico Davila, Dr Brent Jacobs and Mr Faisal Nadeem (UTS). It was conducted in collaboration with Dr Rob Kelly and Dr Nami Kurimoto (WVA). This brief has benefited from reviews by Stephen Milford, ANCP Impact Advisor, Katie Chalk, ANCP Manager, and Dr Saba Mebrahtu Habte, Impact Evidence Building Manager, WVA.

This study was supported by the Australian government through the Australian NGO Cooperation Program (ANCP).

Front cover photo: Solar water pumps, introduced by DryDev Kenya in Machakos County, greatly reduced workload.

SUMMARY OF FINDINGS

- **Thematic analysis revealed that climate-smart agriculture is reflected in multiple contexts within World Vision Australia's (WVA) agricultural development programming;** the climate-smart agriculture framework continues to evolve as a dynamic concept and remains significant for NGOs such as World Vision.
- **WVA's food security and nutrition program offers opportunities to expand explicit climate-smart agriculture design to support inclusion of women and other vulnerable groups,** including children; mitigation opportunities could be an emerging area for NGOs such as WVA.
- **Future application of climate-smart agricultural interventions requires careful mapping of trade-offs from the initial concept design** to maximize the impacts and reduce the risk of unintended outcomes across the three pillars of Food & Agriculture Organization (FAO's) climate-smart agriculture framework.
- **World Vision could facilitate knowledge-based agricultural development programming** which, given its role in large-scale development interventions, offer opportunities for improved application of climate-smart agriculture.

Climate-smart agriculture through farm ponds in Makueni County, through DryDev Kenya.

CONTEXT

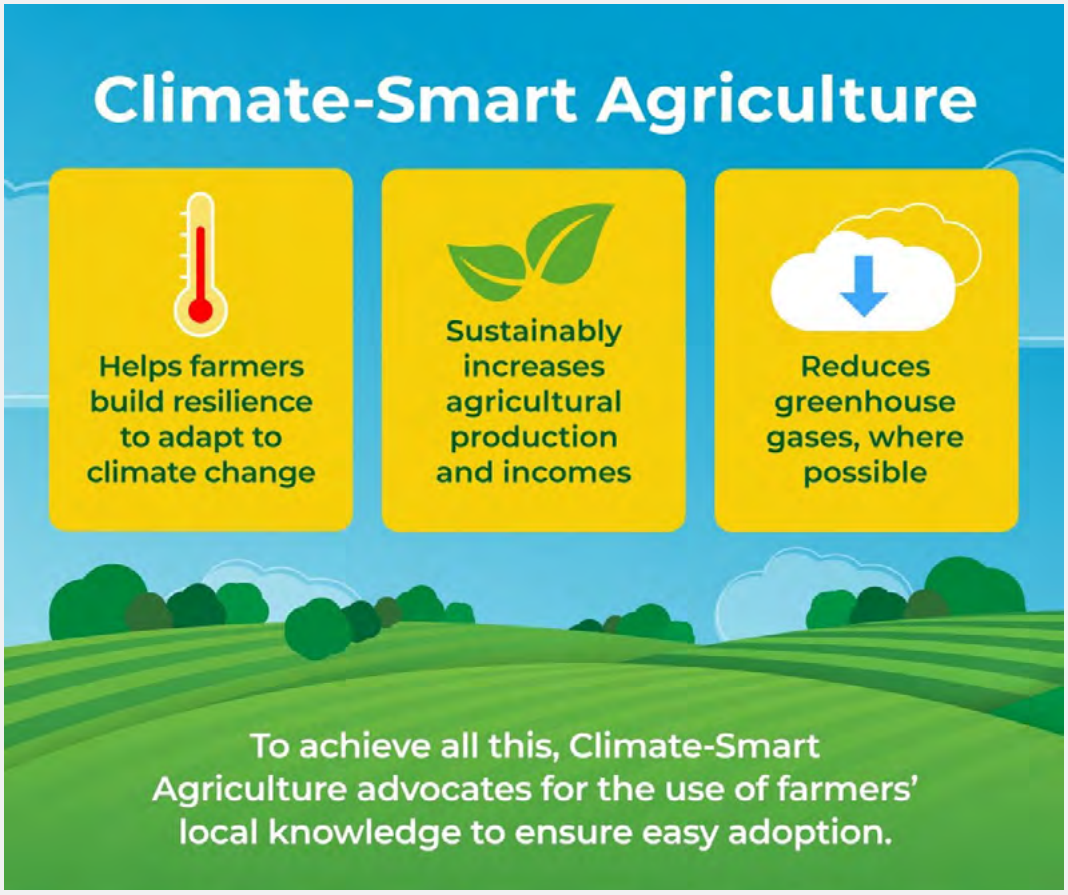
Agricultural activities take place in 38% of the planet's terrestrial surface, use approximately 70% of global freshwater resources, and when combined with the distribution and processing of products in the food system, contribute up to one third of human-derived greenhouse gas emissions[1].

With global food demand set to double by 2050[2], there is increasing debate about how this demand will be achieved at a time when our food systems must contribute towards emission reductions while also adapting to a changing climate.

WHAT IS CLIMATE-SMART AGRICULTURE

The concept of Climate-Smart Agriculture (or CSA) has emerged in response to these interrelated challenges around the future of food security in a climate-impacted world. Developed by the UN's Food & Agriculture Organization (FAO)[3,4], climate-smart agriculture is a set of agricultural interventions or practices that seek to meet three objectives: **(1)** sustainably enhance agricultural productivity to support increases in income and food security; **(2)** adapt and build resilience to climate change; and **(3)** develop opportunities to remove and/or reduce greenhouse gas (GHG) emissions, where possible, through agriculture *(Figure 1)*.

Figure 1: FAO's climate-smart agriculture framework made up of the three pillars: Productivity, Adaptation and Mitigation



Source: FAO (https://twitter.com/fao/status/1192496863850704896)

1 Crippa, M., Solazzo, E., Guizzardi, D., Monforti-Ferrario, F., Tubiello, F.N. & Leip, A. 2021, 'Food systems are responsible for a third of global anthropogenic GHG emissions', *Nature Food*, vol. 2, no. 3, pp. 198-209.
2 Fukase, E. & Martin, W. 2020, 'Economic growth, convergence, and world food demand and supply', *World Development*, vol. 132, p. 104954.
3 Mann, W., Lipper, L., Tennigkeit, T., McCarthy, N. & Branca, G. 2009, *Food security and agricultural mitigation in Developing Countries: Options for capturing synergies*, Food and Agriculture Organization, Rome, Italy.
4 Lipper, L., Thornton, P., Campbell, B.M., et al. 2014, 'Climate-smart agriculture for food security', *Nature Climate Change*, vol. 4, no. 12, pp. 1068-72.

Climate-smart agriculture has been further strengthened as both a framework and an approach, receiving considerable attention from international research and donor agencies [5]. The recent United Nations Food Systems Summit in 2021 saw the World Economic Forum and the World Bank advocate for climate-smart agriculture, while multiple developing countries have now adopted "climate-smart agriculture" as a pathway to achieve their Paris Agreement's Nationally Determined Contributions (NDC). Examples of climate-smart agricultural practices are described briefly in Box 2.

BOX 2 WHAT IS CLIMATE-SMART AGRICULTURE?*

Climate-smart agriculture (CSA) is not a one size fits all concept. CSA offers a diverse range of practices, or options, that seek to fulfill the three pillars of productivity, adaptation and mitigation. CSA entry points can be classified into three thematic areas: **(1)** practices; **(2)** systems approaches; **(3)** enabling environments for CSA.

Climate-smart agriculture practices and technologies are delivered through a range of entry points: soil management, crop management, water management, livestock management, forestry, fisheries and aquaculture, and energy management. Practices are "ways of doing things", such as conservation tillage, intercropping, integrated pest management, and integrated nutrient management. Technologies are new tools introduced into old or new practices, such as drought-tolerant varieties, slow-release fertilizer, rainwater harvesting or drip irrigation. CSA practices are generally introduced at the farm level.

Climate-smart agriculture systems approaches use a systems perspective; entry points include landscape approaches and value chains. Landscape approaches seek to integrate sustainable management of natural resources with livelihood considerations, recognising their interdependencies. Watershed management, integrated crop-livestock management, agroforestry, sustainable fisheries management, and improved grazing are examples of landscape approaches. Value chains, or market systems, can become more climate-smart while products move from farm to plate. Entry points include diversification, climate-proofing, and supply chain efficiencies.

Enabling environments are the framework conditions that facilitate and support the adoption of CSA practices and technologies. Entry points include policy engagement, institutions, infrastructure, gender and social inclusion, insurance schemes, and climate information services.

*From https://ccafs.cgiar.org/resources/tools/csa-guide

RATIONALE FOR THE REVIEW

World Vision Australia (WVA) advocates for sustainable development, working with children, families, and communities to overcome poverty and injustice. WVA actively links issues of poverty reduction and inequality with the climate crisis, and increasingly focuses on embedding climate action into its programme. A 2022 review by World Vision International [6] found a total of 1,100 projects being implemented throughout the WV Partnership seeking to address environmental and climate change challenges across 46 countries.

However, despite interest by donors and research agencies, published literature reveals that a clear understanding and application of the FAO climate-smart agriculture framework in practice remains elusive. It is still unclear how climate-smart agriculture is designed, conceptualised, and embedded into agricultural development projects[7]. The diversity of climate scenarios for different agricultural regions, coupled with multi-layered socio-political structures – which also affect adoption of climate-smart agricultural technologies – makes the application of FAO's climate-smart agriculture framework a complex development activity[8].

5 As an example, refer to https://www.worldbank.org/en/topic/climate-smart-agriculture
6 World Vision International 2022, *Environment and Climate Action: Investing in Sustainable Outcomes for Children*, World Vision International.
7 Gardezi, M., Michael, S., Stock, R., Vij, S., Ogunyiola, A. & Ishtiaque, A. 2022, 'Prioritizing climate-smart agriculture: An organizational and temporal review', *WIREs Climate Change*, vol. 13, no. 2, p. e755.
8 Newell, P., Taylor, O., Touni, C. 2018, 'Governing Food and Agriculture in a Warming World', *Global Environmental Politics*, vol. 18, pp. 53-71.

Addressing gender and power dynamics is important to WVA programmes. The traditional technological focus of the climate-smart agriculture framework fails to acknowledge the underlying structural power dynamics and drivers of vulnerability that affect smallholder farmers [9], including inability to respond to farmer priorities, equal access for women and men to land and extension services, and lack of secure land tenure[10]. Others have noted an absence of gender mainstreaming in recent climate-smart agriculture documentation[11].

PURPOSE

The purpose of this review was to examine how climate-smart agriculture is reflected in WVA's programming, using FAO's CSA framework as a guide. The review considers the role that WVA and other development actors, could play in strengthening CSA approaches to positively impact the poor and the vulnerable, including women and children. The findings will inform future agri-food systems programming to support smallholder farmers and local communities in catalysing climate-resilient food systems.

KEY RESEARCH QUESTIONS

The review addresses the following questions:

- How does the FAO framework align with WVA's climate-smart agriculture programming?
- How is WVA currently implementing climate-smart agriculture approaches?
- In what ways are the three pillars of FAO's climate-smart agriculture framework integrating to support community development outcomes in WVA programming?

These questions were tested with a set of six development projects that focused on smallholder agri-food systems and with linkage to climate-smart agriculture themes. The set was intended to be heterogeneous to reflect a diverse range of contexts and applications and donor spread *(Table 1)*.

Solar-powered irrigation to support year-round vegetable cropping to lift productivity through AACRS, Afghanistan.

9 Newell, P. & Taylor, O. 2018, 'Contested landscapes: the global political economy of climate-smart agriculture', *The Journal of Peasant Studies*, vol. 45, pp. 108-129.
10 Ewbank, R. 2015, 'Climate-resilient agriculture: what small-scale producers need to adapt to climate change.' Christian Aid, London, UK.
11 Cohn, A.S., Newton, P., Gil, J.D.B., Kuhl, L., Samberg, L., Ricciardi, V., Manly, J.R., Northrop, S. 2017, 'Smallholder Agriculture and Climate Change', *Annual Review of Environment and Resources* vol. 42, pp. 347-375.

METHODOLOGY

A desktop review of literature was firstly undertaken to gauge current perspectives on the FAO climate-smart agriculture framework, and to inform the review.

Next, documentation from the six selected smallholder-focused projects that had WVA involvement, with general climate-smart agriculture themes, were collated *(Table 1)*.

Document analysis was performed in two steps. Firstly, project objectives and change theories were screened against the three pillars of the FAO climate-smart agriculture framework (namely productivity, adaptation, and mitigation) to determine the extent of alignment with these pillars, and whether the three pillars were incorporated at goal and outcome level as part of their key intent for change. Project actions were also screened to see what types of climate-smart agricultural interventions were being promoted.

Secondly, the frequency of a pre-defined set of keywords implicitly related to the three pillars was assessed using search functionality and presented as thematic maps. Documents, drawn from each project's design, implementation and evaluation, from the six representative projects were analysed [12].

The analysis identified thematic clusters by which climate-smart agriculture was being conducted, based on the extent of frequency with qualitative content analysis. The findings below identified a total of seven themes through which the selected projects conducted climate-smart agriculture.

LIMITATIONS

For this review, evaluations were not examined to assess specific results and impact of these projects; rather, the review examined strategic approaches and design principles against the climate-smart agriculture framework.

Climate-smart and nutrition-sensitive vegetable gardens to enhance productivity through the AHAN project, Lao PDR.

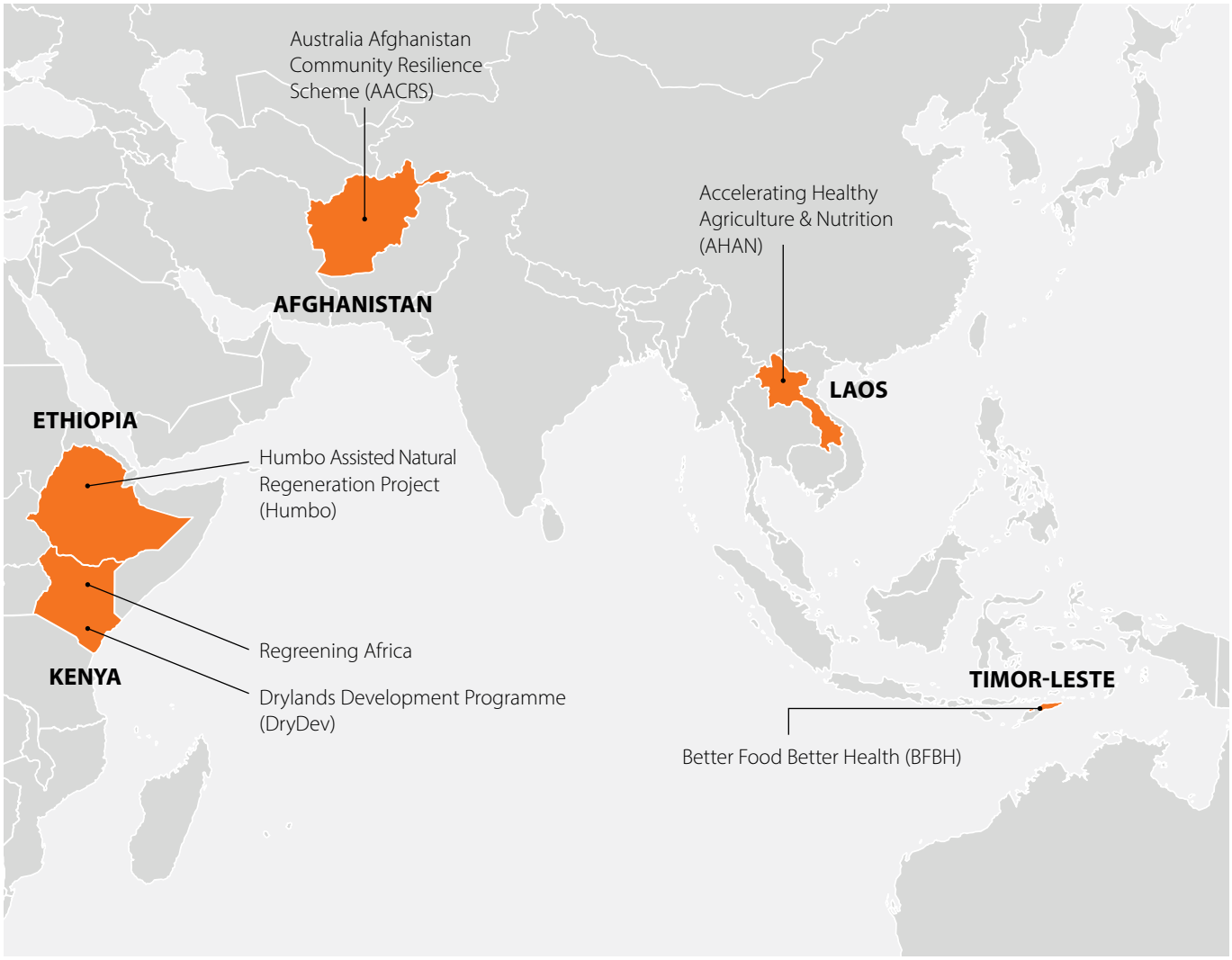
12 To establish a "baseline" for the comparison, a thematic map was generated by analysing FAO's original CSA publication.

Table 1: Summary of six selected projects with alignment to the FAO climate-smart agriculture framework

Project	Country	Donor organization	Period	Target	Overall goals and outcomes
Humbo Assisted Natural Regeneration Project (Humbo)	Ethiopia	WVA (2006-2012), financed through sales of carbon credits	2006-2035	41,529 beneficiaries	*Sequestered carbon in a biodiversity native forest through farmer managed natural regeneration and improved livelihoods of community with flows of benefits.* **Outcome:** 2,728 ha of degraded area is restored to forest, as per country definition
Regreening Africa*	Kenya	European Commission (87%), WVA (10%), WV Kenya (3%)	2017-2022	50,000 households	*To mobilize and work with a critical mass of diverse partners to scale up locally appropriate ways of integrating trees into agricultural systems to successfully reverse land degradation across Africa.* **Objectives: (1)** sustainable land management; **(2)** strategic decision-making; (3) scaling-up of evergreen agriculture
Drylands Development Programme (DryDev)*	Kenya	Dutch Ministry of Foreign Affairs (DGIS) (70%), WVA	2013-2019	34,500 beneficiaries	*Sustained improvements in food and water security, livelihoods and resilience, and the empowerment of women and disadvantaged farmers.* **Outcomes: (1)** improved water capture and soil conservation/fertility at sub-catchment and farm levels; **(2)** increased production of profitable, climate-smart commodities and food crops; **(3)** increased quantities of targeted value chain products sold by farmers; (4) improved local governance and institutional functioning
Australia Afghanistan Community Resilience Scheme (AACRS)	Afghanistan	Department of Foreign Affairs & Trade (DFAT)	2014-2018	115,000 beneficiaries	*Sustained livelihoods among communities and families inclusive of vulnerable groups in Badghis.* **Outcomes: (1)** families are more food secure; **(2)** producers sell more products in existing and new markets; **(3)** the vulnerable, including women headed households are benefiting from project initiatives
Accelerating Healthy Agriculture & Nutrition (AHAN)	Lao PDR	DFAT** , European Union (EU)	2018-2022	31,673 beneficiaries	*To create supportive conditions for enhanced household nutrition.* **Specific results: (1)** improved access and availability to sufficient and/or diverse foods year-round; **(2)** improved dietary and care practices among women of reproductive age; **(3)** reduced incidence of selected WASH related illnesses linked to malnutrition; **(4)** improved gender equitable relations, particularly in decision-making and distribution of workload; and **(5)** strengthened multi-sector coordination and support for nutrition
Better Food Better Health (BFBH)	Timor-Leste	DFAT** (via ANCP)	2017-2021	31,806 beneficiaries	*Children under 5 and their mothers are well nourished.* **Outcomes: (1)** caregivers of children under 5 have improved nutrition, hygiene and health-seeking practices; **(2)** households have improved access to superfoods; **(3)** households have increased income from superfood production; **(4)** improved sustainability of health and agriculture services

* Multi-country programmes; figures provided are at the country-level only.

** This project was supported by the Australian Government through ANCP



Promoting healthy diets by growing and consuming superfoods, including moringa, in the BFBH project, Timor-Leste.

FINDINGS

As expected, the analysis confirmed that none of the projects used FAO's original climate-smart agriculture framework as an explicit lens to design their projects *(Table 2)*. All projects were oriented strongly towards the productivity pillar as a driver of food security and nutrition (FSN). Similarly, there was strong orientation or alignment towards the adaptation pillar, although this was only implicit in the designs. Apart from one carbon-generating project, none was oriented explicitly towards the mitigation pillar. Integrated programming was a common thread, such that CSA actions tended to be one component of a bundle of interventions.

Table 2: Alignment with the FAO's three climate-smart agriculture pillars

Productivity	Adaptation	Mitigation
Strongest and most aligned – many projects ***explicitly*** sought to boost productivity. For example, this was to be achieved through regeneration of trees (Regreening Africa), raising of nutrient-dense crops (BFBH Timor-Leste), or lifting of incomes through better market linkages and market orientation (AACRS Afghanistan, AHAN Laos and DryDev Kenya).	Featured implicitly in all projects. Key examples include promotion of vegetative cover to improve climate adaptation (such as through Farmer Managed Natural Regeneration or tree-planting) (Regreening Africa, DryDev Kenya), switching to drought-tolerant varieties (AACRS Afghanistan), or lifting of incomes (AACRS Afghanistan, AHAN Laos), though the climate adaptation link was not stated.	Only one project (Humbo Ethiopia) ***explicitly*** targeted mitigation through generation of verified carbon credits. Others ***implicitly*** targeted mitigation through adaptations promoting increased vegetative cover (such as through FMNR or tree-planting) (Regreening Africa, AACRS Afghanistan, DryDev Kenya).

PRODUCTIVITY

All three African projects had a strong focus on boosting productivity of smallholder farms and landscapes through the regeneration of trees. These projects promoted Farmer Managed Natural Regeneration (FMNR) as the agricultural practice of focus. A recent review by World Vision International [13] identifies FMNR as a major contributor towards its efforts to address climate change, pointing out that FMNR can be "integrated easily with CSA in order to tap its full potential".

The BFBH Timor-Leste project also sought to boost productivity as a way to enhance FSN; this was to be achieved in a "nutrient-sensitive" manner by promoting the production of high nutritive-value crops, or 'superfoods', for consumption and sale.

AACRS Afghanistan, DryDev Kenya and AHAN Laos similarly focused on lifting productivity and income to build FSN, although the pathway was through adoption of improved restorative and agricultural practices, accompanied by improved market linkage and orientation.

ADAPTATION

Adaptation to climate change featured implicitly in all projects. For some, this was simply through the uptake of FMNR, or tree-planting, to restore landscape productivity and improve buffering. For others, adaptation was expected to come about through the lifting of incomes, whether through improved productivity or more effective market integration, application of new technologies or practices, or due to a preferencing of focus on women's income and their economic empowerment.

Most practices promoted, such as FMNR, rainwater harvesting, small-scale irrigation, and fertility enhancement, form more immediate responses to seasonal variations in rainfall and contribute to longer-term resilience of the agricultural system. Both on-farm FMNR and agroforestry are considered as ecosystem-based adaptations because they regenerate ecosystems, help maintain yields under climate change, and buffer the impacts of seasonal weather variations and extreme events[14]. Most projects also sought to contribute through practice change to improvements in food security and income through sales of excess produce.

13 World Vision International 2022, *Environment and Climate Action: Investing in Sustainable Outcomes for Children*, World Vision International.
14 Vignola, R., Harvey, C.A., Bautista-Solis, P., Avelino, J., Rapidel, B., Donatti, C., Martinez, R. 2015, 'Ecosystem-based adaptation for smallholder farmers: Definitions, opportunities and constraints'. *Agriculture, Ecosystems & Environment*, vol. 211, pp. 126-132.

MITIGATION

Mitigation was implicit in the African projects' design due to the anticipated carbon sequestration achieved by afforestation through FMNR practices. Humbo Ethiopia did have an explicit mitigation outcome, with 863,183 tCO_2e expected to be sequestered over the project's lifetime.

Only the Humbo Ethiopia project explicitly incorporated and measured mitigation outcomes; this was due to the project relying on international carbon finance through sales of verified emission reductions. However, other Africa-based projects that incorporated FMNR and regreening practices were clearly mitigation-supportive but impacts were neither measured, estimated nor reported. For the other projects, mitigation was not part of the framing; in fact, focus on raising food and income levels in Laos, Afghanistan and Timor-Leste may have diluted any possible mitigation potential through these possible associated emissions from these commodities.

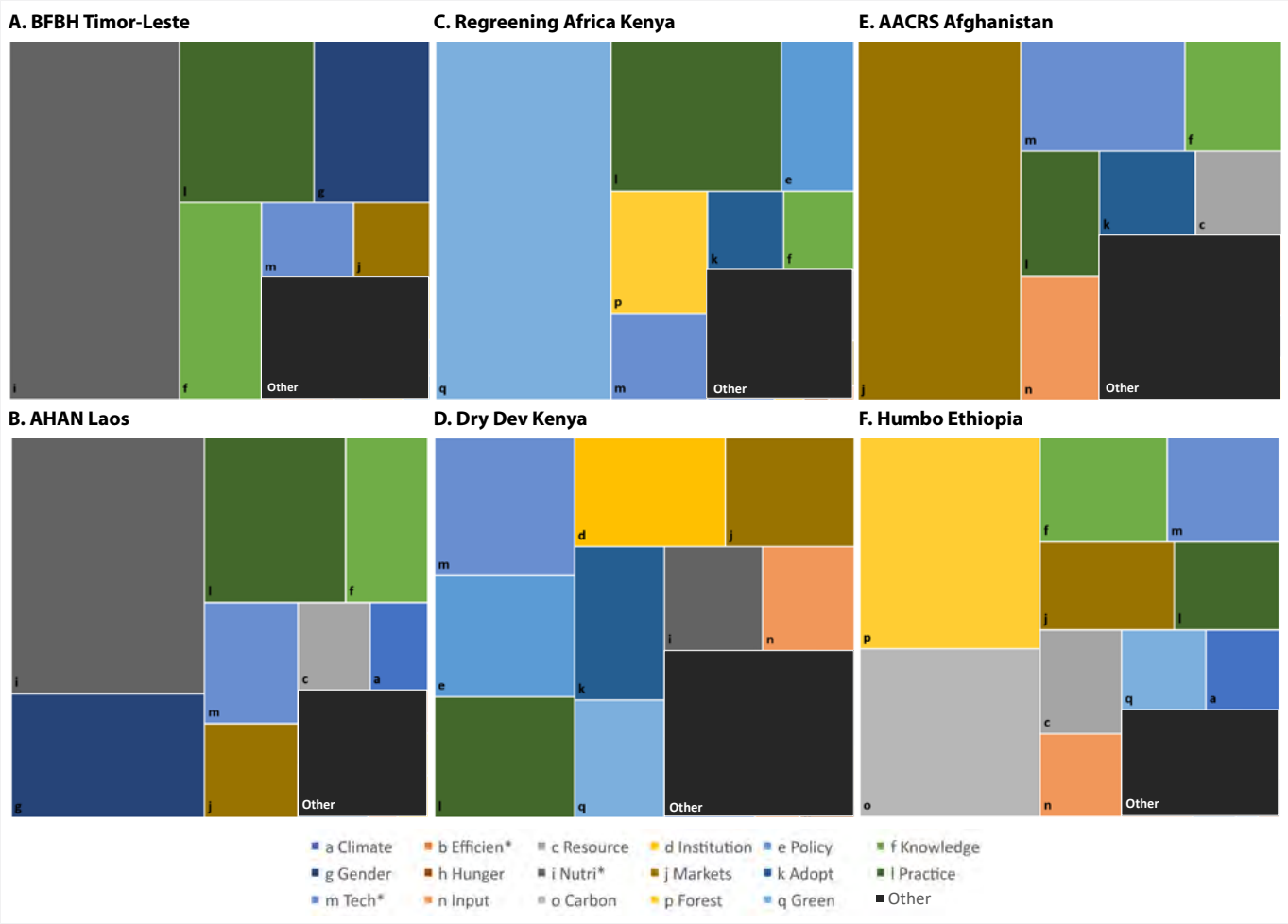
THEMES USED TO ACHIEVE CSA

Thematic and keyword analyses on the selected projects' documentation revealed the climate-smart agriculture entry points for WVA's programming *(Figure 2)*. The ways that selected projects connected with climate-smart agriculture varied considerably. By combining high-frequency keywords, the results were 'clustered' into seven themes by which CSA was being conducted or how CSA was embedded by design. Each project touched on more than one theme, highlighting both the variations in context and the complex and integrated nature of the designs.

The following themes linked WVA's agri-food interventions with CSA:

- Greening and forest
- Uptake
- Markets
- Policy and institutions
- Nutrition
- Carbon and climate
- Gender

Figure 2: Thematic map of frequency of keywords associated with FAO's climate-smart agriculture framework on selected agricultural development projects



RESULTS BY PROJECT

The key words *green** and forest appeared most frequently in projects with objectives to reverse land degradation through FMNR. Of the six projects analysed, Regreening Africa *(Figure 2.C)* and Humbo Ethiopia *(Figure 2.F)* used FMNR as the preferred approach to promote land remediation among smallholder farmers.

The term *green**, was most frequently used in Regreening Africa with deeper analysis finding it was associated with two related concepts: greening practices and regreening. Although *green** was initially considered a part of the mitigation pillar, in Regreening Africa it was more closely aligned with adaptation than with carbon sequestration. In Humbo Ethiopia, while it appeared with reduced frequency, *green** was mainly associated with the role of vegetation in carbon sinks. Key word forest replaced *green** in Humbo Ethiopia as the most frequently used CSA-related term (it was the third highest in Regreening Africa), related to mitigation through carbon sequestration; however, it was more aligned with adaptation in Regreening Africa through the adoption of agroforestry practices to improve land use sustainability, expand livelihood options and develop alternative value-chains.

In other projects, both terms appeared less often, or not at all (e.g. *green** in AHAN Laos). The exception was DryDev Kenya *(Figure 2.D)*, where green* was associated with the successful adoption of a new drought-tolerant crop, green gram. While BFBH Timor-Leste incorporated FMNR principles, regreening or agroforestry themes rarely appeared in the context of the aim to increase superfood production (discussed in the Nutrition theme below).

Regenerating forest cover, sequestering carbon, and generating carbon credits at Humbo, Ethiopia.

UPTAKE

The key words of *practice, technology, adoption* and *knowledge*, referred to here as "uptake", appeared with varying frequency in all projects *(Figure 2)*. These terms *practice, tech** and *adopt* were primarily connected with the adaptation pillar of CSA, and thematic analysis indicated they were used in that context in the project reports. Knowledge was generally used in relation to knowledge sharing and agricultural extension (e.g. Regreening Africa and DryDev Kenya). These often appeared together in phrases such as 'adoption of new practices and technology'. In particular, DryDev Kenya, which was the only project that directly referenced in documentation 'CSA production practices' and 'knowledge of CSA', listed sets of practices that were promoted through the projects *(see Box 2)*. However, while not explicitly linked with CSA through the thematic analysis, the implication was that they defined CSA within the project.

Adoption of technologies and practices, presumably as a way to lift incomes and productivity, was also present in projects focused on markets and nutrition. In BFBH Timor-Leste, a major component was the extension of superfood crops (such as pulses and orange sweet potato). Knowledge and practices were associated with changes in habits in the establishment of superfood production, and changing practices related to hygiene, notably in water use and sanitation. AHAN Laos also had a strong focus on supporting the growing and consumption of high-nutrition foods, and their sale to markets as a way of commercialising agriculture.

MARKETS

In AACRS Afghanistan, *markets*, was the most frequently used key word *(Figure 2.E)*. In other projects, the term appeared less frequently. Thematically, the term was used in two contrasting ways. In all projects, except AHAN Laos, the word was linked to food security through increased productivity that enabled sale of excess produce into new and existing markets. To achieve this, smallholder farmers required improvements in market access, demand, linkages and prices for the surplus produce. The concept of sustainable intensification was occasionally explicitly associated with markets, as in Regreening Africa, 'access to profitable markets for agricultural produce is a major driver for sustainable intensification'. However, in AHAN Laos, this key word was associated with 'creating a supply chain to strengthen the market for sanitation products, linking with small, local concrete or hardware businesses to assist with poverty reduction through development of sanitation within villages.' That is, creating market linkages to allow communities to purchase products rather than to sell them. Although the aim of Humbo Ethiopia was to create an income stream from carbon sequestration, this activity was not closely associated with the need for access to international carbon markets in project documents.

POLICY AND INSTITUTIONS

The use of *policy* and *institutions* varied among the projects. In BFBH Timor-Leste, there was a focus on local and community-based institutions. For example, the project sought to use *Tara Bandu*, a local form of community law, to encourage the reduction of harmful agricultural practices, including tree-cutting, over-grazing and slash and burn agriculture to restore the landscape. In contrast, in Regreening Africa, *policy* and *institutions* most often related to engaging government agencies, policy makers and processes to ensure support for FMNR practice adoption.

While examination of changes in frequency of use of key words between project stages was not the focus of this study, nevertheless the analysis did suggest subtle shifts in emphasis from initial to outcome phases of projects. Initial documents generally covered a much broader range of issues/concepts than outcomes, which involved reporting

Rehabilitating canals to support small-scale irrigation, boosting agricultural productivity through AACRS, Afghanistan.

on metrics, uptake and dissemination of practices. For example, in DryDev Kenya, *policy* and *institutions* appeared more frequently in outcome reporting than in implementation. Thematically, this change signalled the need for altered local governance to embed and expand successful practice adoption in communities.

NUTRITION

The use of *nutri** related terms was limited in four out of the six projects *(Figure 2.C, 2.D, 2.E. & 2.F)*. However, while nutrition was not the focus, there was recognition that, through adoption of FMNR, the 'selection and planting of appropriate trees can complement naturally regenerating ones, for example to improve nutritional outcomes, enhance household incomes, or to provide a perennial fodder, fruit or timber source'.

In contrast, themes in BFBH Timor-Leste and AHAN Laos *(Figures 2.A & 2.B)* were explicitly aligned with human dimensions of nutrition. These projects targeted activities related to changing practices and building knowledge around hygiene, breastfeeding, and consumption of healthier foods. Improvements in nutrition from agriculture were largely related to food grown at household level – a common aspect of smallholder farming systems.

WVA's development programming aims to improve nutrition outcomes for children and women by enhancing availability, utilization and demand for nutritionally diverse foods throughout the year. Drivers of undernutrition are complex, including household food insecurity, limited knowledge of health and nutrition, and gender relations at household level. Considering social and behaviour change approach at individual, household and community levels, WVA's programming highlights the focus of child welling in climate-smart agriculture through the nutrition sensitive lens.

CARBON AND CLIMATE

Carbon rarely featured in key word searches of project documents with the exception of Humbo Ethiopia where it was frequently related to development of 'cooperatives to manage the forest and the revenues generated through carbon credit sales. Where carbon appeared in Regreening Africa it was associated with improvements to soil health.

While all project documents contained the key word *climate*, it was primarily associated with climate change as an underlying driver of local community vulnerability and the need for NGO intervention. For example, *climate* appeared in AACRS Afghanistan *(Figure 2.E)* thus, 'the overall mission is to enable vulnerable Afghan farmers to adapt to climate change and support them to mitigate the impacts.' Global trends highlight the increasing relevance of mitigation-specific (or carbon-based) development programming to drawdown CO_2 and reverse climate change.

GENDER

Gender was addressed at different levels within the projects with relatively greater frequency in the Southeast Asia projects than those in Africa. AHAN Laos and BFBH Timor-Leste were more focused on nutrition of children and women *(Figures 2.A & 2.B)*. AHAN Laos explicitly considered gender at the objective level, seeking to improve dietary diversity for malnutrition reduction and enhance care practices (including hygiene) among younger women and children to integrate gender and food security concerns. In Regreening Africa, although a minor theme, gender was strongly linked with resources and related to the recognition of women's roles and the need for their inclusion in decision making on natural resource management.

Gender discourse in climate change is a more recent focus than that of agricultural mitigation and adaptation, offering opportunities for future CSA design to explicitly address underlying gender inequalities and avoid the risks of perpetuating vulnerabilities. CSA's tendency to focus on technologies and institutional mechanisms has been criticized because of the risks of perpetuating gender inequalities and vulnerability of women to climate impacts[15].

Given that gender vulnerabilities are exacerbated under climate change, gender is increasingly a key objective across WVA's development programming. In the current ANCP cycle (FY22-23), 25 out of current 28 ANCP project have significantly incorporated gender in their designs, with gender at the outcome level. Inclusive market systems development (iMSD) and women's economic empowerment (WEE) are CSA-supportive, scalable economic development approaches promoted by WVA that empower households to increase their income, assets and financial stability.

15 Taylor, M. 2018, Climate-smart agriculture: what is it good for? *The Journal of Peasant Studies*, vol. 45, pp. 89-107.

CONCLUSIONS

The analysis and review above have led to the following insights on how climate-smart agriculture, as a development approach, is being used to build climate resilience at WVA.

World Vision Australia's food security and nutrition program offers opportunities to expand explicit climate-smart agriculture design to support the inclusion of women and other vulnerable groups, including children.

The literature review highlighted that the technological focus of climate-smart agriculture creates a risk that the underlying drivers of vulnerability, including social norms and power dynamics; gender relations of decision-making, distribution of workload and access to land, may not be addressed. However, the analysis of WVA programming found that all six projects had gender inclusion components, suggesting there are ways to augment the climate-smart agriculture framework to be more inclusive. Formalising the CSA framework to be explicit of these social challenges would strengthen achievement of climate-smart agriculture outcomes. In addition, achievement of nutrition outcomes for vulnerable groups, especially children and pregnant or lactating women, can be supported through climate-smart agriculture.

Climate-smart agriculture continues to be an emerging and highly fluid framework in the literature as well as practice, evidenced by the diversity of WVA activities related to climate-smart agriculture.

Our literature review and analysis highlight a growing body of evidence on the impact of climate-smart agriculture, along with increasing appetite for countries to adopt this framework as a core pathway to achieve their Paris Agreement commitments.

However, climate-smart agriculture is still an emerging and fluid concept. The broad definition carries the risk that virtually any agriculture-related development activity can be portrayed as being "climate-smart". Tools to analyse and contrast the trade-offs that exist between the three pillars remain complex and require detailed biophysical and social assessment often out of reach of development practitioners.

The fact that a diverse range of keywords could be identified in WVA's work through the thematic analysis reflect the flexibility of climate-smart agriculture as a guiding framework. The advantage of flexibility (for development actors) lies in being able to accommodate context, to incorporate smallholders' local knowledge, to manage donor and country priorities, and to offer multiple viable climate-smart agriculture "options" that can be compared in consultation with researchers and smallholders.

Though climate-smart agriculture as a term wasn't strongly visible in the analysis, one or more of the pillars are present in all six agri-food projects. It isn't clear how strongly these projects are aligned with the pillars or whether trade-off analysis has helped sift climate-smart agriculture options. Though a variety of themes are being used to conduct climate-smart agriculture, the extent to which CSA pillars contributes to food security and nutrition, or to livelihoods, is difficult to show. Climate-smart agriculture is being used more for general framing or process rather than as a clear implementation framework.

More explicit design would improve alignment with the FAO climate-smart agriculture framework and strengthen the evidence base in which climate-smart agriculture interventions can improve FSN and livelihoods.

The climate-smart agriculture framework is significant for NGOs such as World Vision Australia in terms of the three key pillars – production, adaptation, and mitigation.

Agriculture and food systems remain a significant contributor to climate change, while at the same time, a changing climate affects agricultural productivity. This in turn impacts food and nutrition security, particularly that of most vulnerable groups such as women and young children in developing countries. Climate-smart agriculture brings these issues together by helping to guide actions needed to transform and reorient agricultural and food systems to support development and ensure food and nutrition security in a changing climate[16].

As such, the climate-smart agriculture framework is significant for NGOs working with smallholder farmers in poorer countries that are more vulnerable to the effects of climate change. WVA has used the climate-smart agriculture framework in general terms to streamline activities and qualify selection of options. Although closer alignment to the concept can strengthen outcomes, there is ongoing relevance and value to apply the climate-smart agriculture framework to agricultural development.

Mitigation is an emerging area for WVA.

Only one project (Humbo) addressed the climate-smart agriculture mitigation pillar explicitly. However, FMNR, agroforestry, landscape restoration and other regreening approaches – activities mentioned in three other WVA projects – clearly do contribute towards carbon drawdown, even though sequestration is not being calculated. FMNR along with agroforestry continue to be promising climate-smart agriculture practices for WVA with scale-up potential, and proxy measures or estimates of sequestration would be useful in trade-off discussions.

Trees improve agricultural productivity and household income, building climate adaptation through Regreening Africa in Homa Bay County, Kenya.

16 https://www.fao.org/climate-smart-agriculture/en/

RECOMMENDATIONS

NGOs, including WVA, should clearly articulate how to balance trade-offs in future programming when applying FAO's climate-smart agriculture framework – i.e. to balance traditional market approaches to improving food security, with supporting the nutrition needs of populations, adapting to long-term and sudden onset climate shocks, and mitigating carbon emissions.

The FAO's climate-smart agriculture framework can be expanded beyond the largely technological approaches to agricultural development, recognising the climate-smart benefits arising through traditional knowledge systems, and further reducing the risk of unintended outcomes across the three pillars of FAO's climate-smart agriculture framework.

WVA could facilitate knowledge-based agricultural development programming and given its role in large-scale development interventions, offer opportunities for improved application of climate-smart agriculture through the WVI partnership.

Watershed-level climate-smart agriculture supported by a sand dam in Kenya through DryDev.

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