Prepared by SDCC-AR
28 June 2017

Rural Development and Food Security (Agriculture)

Climate Finance Tracking: Agriculture and Natural Resources Sector

Outline

- **Overview** of agriculture and food security issues in Asia in the Pacific
- **Strategic shift** from sector development to multisector approach for food and nutrition security
- **Approach** to climate finance tracking for agriculture and natural resources sector
- **Eligible/Ineligible Activities** for **adaptation** finance
- **Eligible/Ineligible Activities** for **mitigation** finance
- **Examples** for counting and tracking climate finance

Prepared by SDCC-AR
28 June 2017

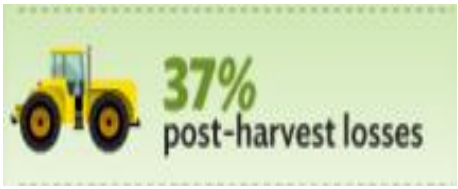
Overview of Sector Issues and Challenges

ADB's Strategic Shift : Food and Nutrition Security in Asia and the Pacific

Current State

In Asia and the Pacific

In Asia



Dynamics

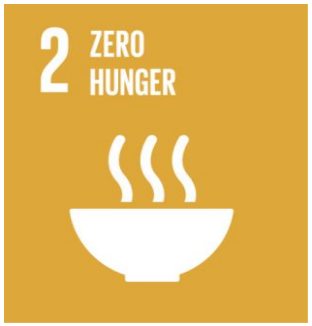
Population growth and demographic transition

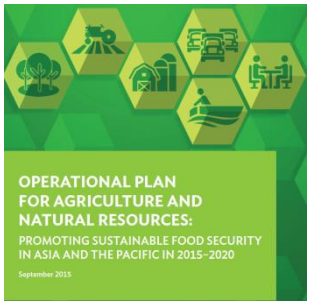
Economic transformation

Climate variability and change

Less water and land resources, and environmental degradation

Objective





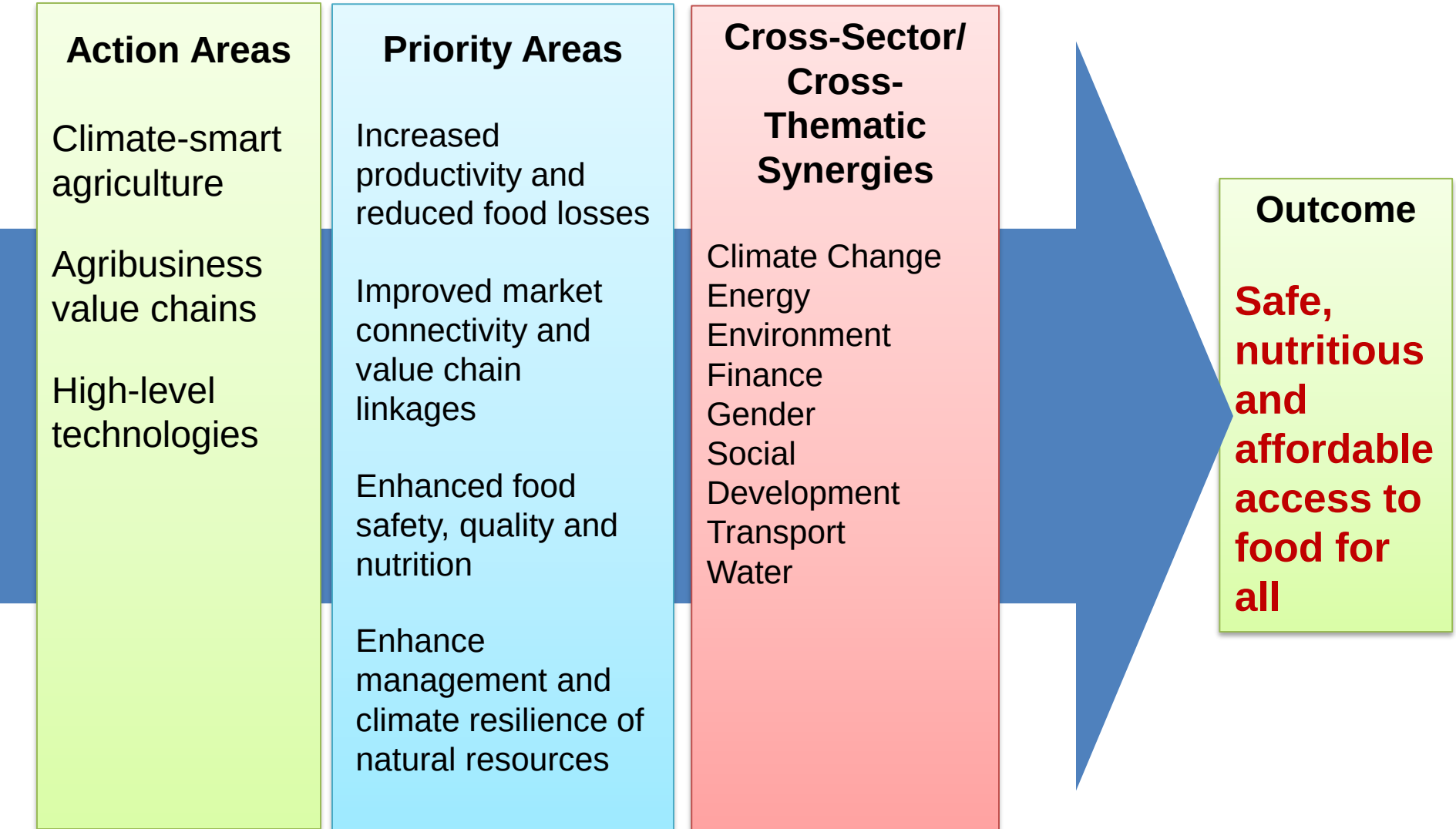
Safe, nutritious, and affordable food

ADB's Strategic Shift : Agribusiness as a driver to ensure food and nutrition security

Core Areas	Investment Areas	Links with Other Sectors/Themes	Links to Global Agenda
Productivity	• Sustainable infrastructure • Commercialization and private service delivery • Climate-smart agriculture • Policy reforms	• Water • Energy • Finance • Social • Gender • Climate change	• SDG (2, 5, 6, 7, 12, 13) • COP 21
Market	• Logistics and market infrastructure • Agribusiness and value chains • ICT and rural-urban-market linkages • Policy reforms	• Public-private partnership • Transport • Finance • Urban • Social development	• SDG (2, 9, 11, 17) • Addis Ababa
Food Safety, Quality, and Nutrition	• Infrastructure for safety and standards • Policy, regulation, and capacity • Outreach and education • Policy reforms	• Health • Social • Gender • Education	• SDG (2, 3, 4, 5)
Natural Resources	• Climate resilience • Land, soil, forest, river basin management	• Water • Social • Gender • Climate change	• SDG (2, 5, 6, 13, 14, 15) • COP 21

Operational Plan 2015-2020

OUR PRIORITIES AND ACTION AREAS



CLIMATE-SMART AGRICULTURE (CSA) WORKING GROUP

Climate Smart Agriculture (CSA) :

- **Simultaneously increase**, in a sustainable manner, **productivity** and income growth in agriculture
- Support **adaptation** across the agricultural sectors to expected climatic changes and **build resilience**; and
- **Reduce**, where possible, the greenhouse gas **emissions** of production systems.

CSA = SUSTAINABLE AGRICULTURE + RESILIENCE - EMISSIONS

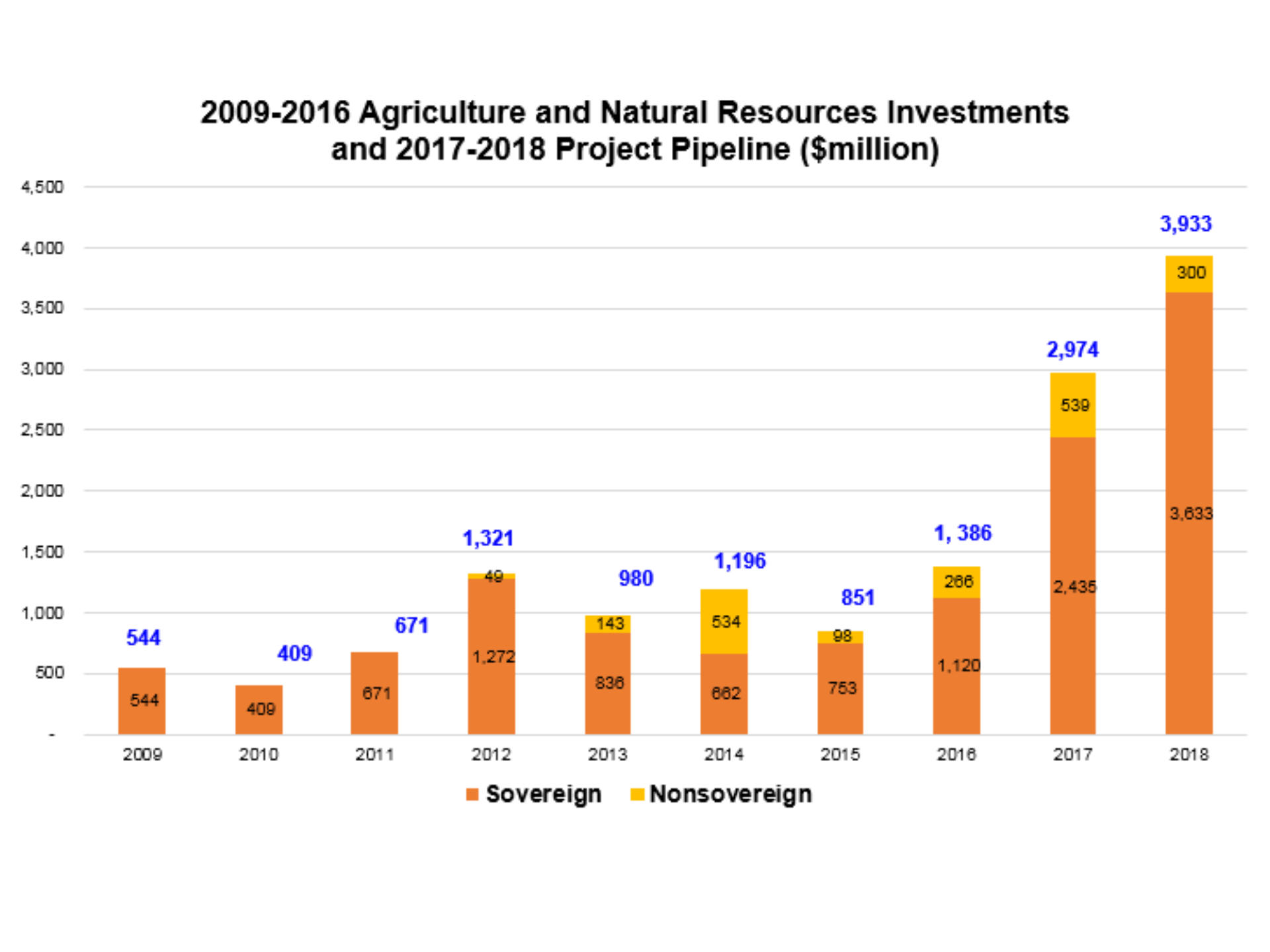
WG Objective: to make all Agriculture and Natural Resources Project Climate Smart by 2020

WG tasks:

- **CSA Concept development** and testing under pipeline projects and sector pipeline development
  - Land leveling + drought resilient rice varieties + AWD for irrigation project (BAN)
  - Agroforestry + inclusive coffee value chain development (TIM, NEP)
- **Track Climate Finance** in ANR Sector

Prepared by SDCC-AR
27 June 2017

ADB's Sector Engagement


2009-2016 Agriculture and Natural Resources Investments and 2017-2018 Project Pipeline ($million)
4,500
4,000
3,500
3,000
2,500
2,000
1,500
1,000
500
-
544
409
671
1,321
980
1,196
851
1, 386
2,974
3,933
544
409
671
1,272
49
836
143
662
534
753
98
1,120
266
2,435
539
3,633
300
2009
2010
2011
2012
2013
2014
2015
2016
2017
2018
Sovereign
Nonsovereign

ADAPTATION TARGET: $1 billion in the ANR Sector

	Adaptation Finance in Agriculture and Rural Development Sector ($ Million)					
	2011	**2012**	**2013**	**2014**	**2015**	**2016**
Total Project Amount	671	1321	980	1196	851	1386
Adaptation Finance	180.12	355.37	291.92	381.30	140.78	358.00
ADB Resources	**159**	**331**	**207**	**379**	**134**	**339**
	24%	25%	21%	32%	16%	24%
External Sources	21	25	85	2	7	19

Source: SDCC and Sector Divisions

Climate Finance in the Sector: Are we exploiting all the adaptation and mitigation investment opportunities?

Climate Finance in Agriculture, Natural Resources and Rural Development ($ million)									
Sector	Mitigation			Adaptation			Climate Finance		
	ADB funds	External funds	Subtotal	ADB funds	External funds	Subtotal	ADB funds	External Funds	Total
2015	67	4	71	134	7	141	201	11	211
2016	32	37	69	339	19	358	371	56	427

Climate Finance Tracking in the Agriculture and Natural Resources (ANR) Sector

ANR SECTOR: Includes irrigation, land and water based natural resources management projects, but excludes agribusiness finance and rural road projects.

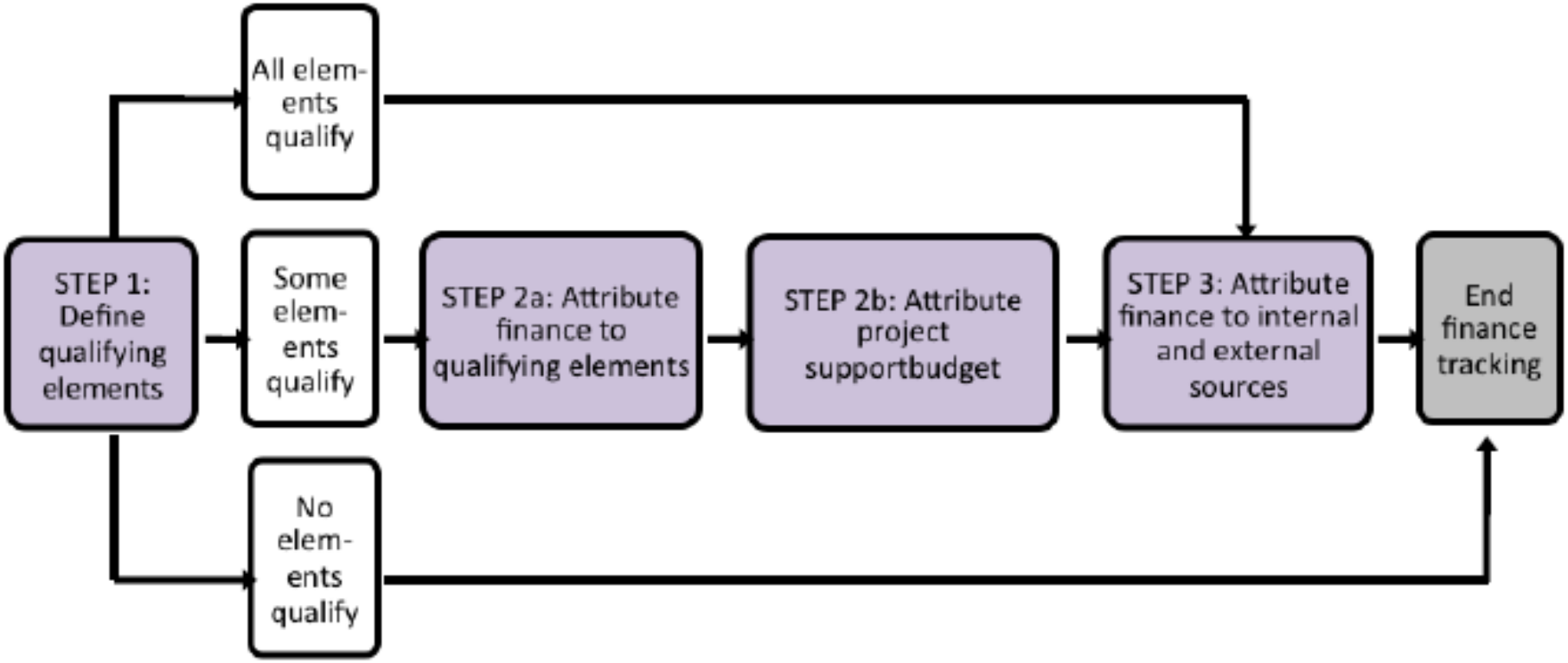
Agriculture, Natural Resources, and Rural Development (ANR)
Irrigation and Agricultural drainage
Rural flood protection
Rural water supply and sanitation services
Rural solid waste management
Rural market infrastructure
Agricultural production (Crop, Livestock, Fishery and Forestry)
Agro-industry, marketing, and trade
Agriculture research and application
Land-based natural resources management
Water-based natural resources management
Agricultural policy, institutional and capacity development
Rural water policy, institutional and capacity development

Source: ADB (2014) *The Project Classification System Towards Strategy 2020 , A User Guide*

Principles of Tracking Climate Finance

- Conservativeness
- Granularity
- Context/location specificity
- Additionality/Incrementality/Proportionality
- Avoid double/triple/quadruple counting (mitigation finance vs. adaptation finance vs. **dual benefit** finance vs. co-finance [ADB-administered vs. external])
- Exclusions
- Ex-Ante
- Evidence-based
- Scope, timeline

Tracking Climate Finance



Tracking approach: Mitigation

- Any output or activity that involves efforts to (a) reduce greenhouse gas (GHG) emissions and/or (b) enhance carbon sequestration qualifies for mitigation finance.
- **Asian agriculture could potentially reduce GHG emissions by 280 million tons CO_2eq per year.**

Qualifying Activities for Tracking Mitigation Finance in ANR Sector

Crop Production:

- Implementing SRI to reduce CH4 and NOx emissions in rice
- Switching to soil management techniques that have demonstrated reduction of GHG emissions
- Activities to improve carbon pools (e.g. use of bagasse, rice husks, or other agricultural waste, reduced tillage techniques that increase carbon contents of soil, rehabilitation of degraded lands, etc.)
- Reduction of non-CO_2 GHG emissions from agricultural practices (e.g. paddy rice production, reduction in fertilizer use)

Irrigation and water management:

- Replacing old water pumps with more energy efficient pumps
- Purchasing new water pumps functioning with renewable energy (e.g., solar pumping)
- Reduction in energy use in traction (e.g. efficient tillage), irrigation, and other agricultural processes

Qualifying Activities for Tracking Mitigation Finance in ANR Sector

Forestry and Land Use:

- Afforestation (plantations) on non-forested land; Reforestation on previously forested land; Avoided deforestation
- Peat land restoration, or wetland management to reduce methane release and rangeland management to increase carbon sequestration
- Sustainable forest management activities that increase carbon stocks or reduce the impact of forestry activities;
- Conservation projects (including payments for ecosystem services) targeting REDD+

Others:

- Change of feedstock to reduce livestock methane emissions; manure management with biodigesters, etc.)
- Post harvest processes and end use energy efficiency that reduce GHG emissions per unit of output
- Production of biofuels, including biodiesel and bioethanol (only if net emission reductions can be demonstrated)

Some non-qualifying activities for mitigation finance in ANR sector

- Practices that do not reduce net GHG emissions after all project impacts are considered
- Cases where improvements in water efficiency are not related to improvements in energy efficiency (e.g., gravity fed systems)
- Cases where deforestation activities are simply displaced to non-project areas
- Soil mgmt techniques that reduce GHG emissions only on a short term basis, but increase emissions on a longer term basis
- Using biomass power leading to unsustainable exploitation of nearby forests and woodlands
- Activities that relocate emissions rather than reduce emissions (e.g., construction of a dam that floods a large area of wetlands)
- Rehabilitation or renovation activities that are not modified to reduce emissions (e.g., rehabilitation of rural infrastructure using old O&M techniques that increase emissions)

Tracking approach: Adaptation

Three Criteria

- Statement of project risks, vulnerability and impacts from climate variability and climate change
- Statement of purpose (e.g., RRP) to demonstrate that the qualifying project activities reduce current and future vulnerabilities to climate change
- Clear and direct link between climate change vulnerability and qualifying project activities

Note: *Good development practice on its own does not qualify for climate finance as it represents business as usual; It is necessary to explain how the project activities go beyond good development practice.*

Qualifying Activities for Adaptation Finance in ANR Sector - I

Costs associated with

Agricultural policy & research:

- Integrating adaptation concerns into ANR plans
- Research and development of crops that are more resilient to climate extremes and change

Crop Production:

- Crop production and diversification with climate resilient varieties
- Resource use efficiency improvement in agricultural systems vulnerable to climate change

Agricultural production and post-harvest infrastructure:

- Restoring and proofing of rural infrastructure, in which design considers future climate change impacts
- Rehabilitation or modifications to infrastructure design to reduce water losses or salt intrusion
- Restoring and proofing of post-harvest infrastructure, in which design considers future climate change impacts

Irrigation and water resources management:

- Changes in irrigation techniques that consider future water availability under a changing climate --- supplemental irrigation, multi-cropping systems, drip irrigation, leveling and other approaches and technologies that reduce risk of large crop failures
- Specific IWRM practices that address climate change impacts

Qualifying Activities for Adaptation Finance in ANR Sector - II

Forestry and Land Use:

- SFM techniques to enhance resilience to climate change
- Maintaining productivity of forest systems under changing climate

Ecosystem conservation:

- Restoration/conservation of ecosystems to reduce vulnerability of farmers to climate change (e.g., establishment of core protected areas and buffer zones for sustainable use of biodiversity and water to meet livelihood needs in more extreme droughts)
- Selection and utilization of neglected and underutilized species known for survival in marginal areas
- Landscape connectivity to support biodiversity adaptation

Fisheries and aquaculture:

- Aquaculture techniques to compensate for the reduction in local fish supplies due to increasing temperature and changes in water flows
- Construction of embankments to fish ponds prone to flooding

ICT and insurance

- ICT-based climate services that can reach the end users efficiently in droughts
- Early warning systems for floods, droughts and typhoons and contingency plans
- Changes in structuring of index-based insurance products

Some non-qualifying activities for adaptation finance

- Research & training activities that do not address climate change
- Restoration of degraded ecosystems that are not at risk from climate change
- Rehabilitation of rural infrastructure that does not consider impacts of future climate change
- Development of irrigation systems that do not consider future water resource availability in a changing climate
- Routine maintenance activities that do not involve any new techniques to address climate change (e.g., maintenance of irrigation equipment, rural roads, post-harvest facilities)
- Conservation farming that do not target watersheds at risks from climate change
- Rehabilitation or renovation activities that are not modified to consider climate change (e.g., rehabilitation of a dam constructed for irrigation, but with no consideration to climate change in dam design)

Adaptation Example: PRC Jiangxi Xinyu Kongmu River Watershed Flood Control and Environmental Improvement

- **Objective**. To improve life quality and better manage intensifying flood and environmental risks due to climate change, the project will invest in integrated and climate-resilient flood and environmental management and water pollution management systems.

- **Vulnerability**. the climate change risks on water systems in Xinyu, including water availability, water supply, sewer and wastewater treatment systems, have been identified. Estimations of rainfall intensity, the key valuable that influence project design, based on three different climate models under a mid-range emission scenario has indicated the changes in the range from – 2% to + 12%.

- **Adaptation investment.** For the project design an increased flow by 15% has been assumed to adequately address estimated climate change risks. The structures for drainage network, flood protection works and wetland have been designed under this increase flow assumption, and *the additional costs of addressing the climate risks are calculated* by comparing the relevant investment costs with this increased flow assumption and the ones under business as usual scenario.

No.	Calculated increase in design flows of 15% due to climate change	Changes in design to address the risk	Additional cost (million CNY)
1	Increase in the water level of canals 0-0.15m	Increase of the top of canals reinforcement 0-0.2m	1.62
2	General increase in flood levels about 0.28m	increase of the top of channel embankment 0.27m	0.35
3	Increase in stormwater 15%	increase of width of rainwater sub-surface utility tunnel from 1.8 m to 2.4m	11.58
4	Increase in stormwater treated by wetland 1633 t/d	expanding wetland area by 1.93 ha	4.45
Total			**18.0**

Climate Smart Agriculture Example: PRC: Fujian Farmland Sustainable Utilization and Demonstration Project

- **Objective**. Agriculture in Fujian Province remains significant, generating 23% of the provincial gross domestic product and 25% of the provincial employment. More than three-quarters of Fujian's arable land is moderately or severely degraded, and the soil erosion and poor soil fertility are the major threats to sustainable and productive agriculture required for improving rural livelihood in the province. Climate change is likely to further amplify the detrimental soil erosion impact on the farmland. The project aims to address the challenge by disseminating sustainable farming technologies and climate-resilient farming practices in 16 project counties.
- **Vulnerability**. Climate change is estimated to impact on Fijian agriculture by temperature increases, reduced and more varied precipitation, increased variability in evapotranspiration and soil moisture, and more frequent and intensified storms. With higher temperatures and longer growing period, the northern boundary of tropical climate zone will move northwards, and North Fujian, currently a mid sub-tropical climate zone, could be changed into a south sub-tropical climate zone. Irrigated and rainfed cropping under the project will be vulnerable to the water stress and higher water demand due to higher temperatures as well as reduced water availability due to lower rainfall. The growth and yield of tea will be significantly affected by drought in the spring, while pomelo and grain crops at the fruiting stages will be vulnerable to droughts in other seasons. Increased crop diseases and insect pests caused by warmer conditions are also expected to adversely impact on crop yields.
- **Qualifying Elements.** For adaptation, the project will invest in (i) the adoption of drought-resistant local crop varieties that can withstand a wider range of temperatures; (ii) water-saving practices including sprinkle and drip irrigation, establishment of shelterbelts of trees around tea and tea-oil plantations; (iii) climate disaster prevention, such as warning system, pest control and drought monitoring; and (iv) on-farm water storage capacity to buffer droughts. For mitigation, the project will invest in (i) advisory on reduced use of fertilizer and pesticides; (ii) training on intermittent irrigation management; and (iii) forage grass and leguminous forage development and sustainable forestry management.
- **Climate Finance Calculation.** In order to link specific segments of project activities with corresponding identified climate change risks, the project team first disaggregated more than 120 contract packages for civil works, equipment and materials that ADB finances down to activity elements, the lowest level of project disaggregation. Then, the team identified eligible elements of adaptation and mitigation finance that correspond to specific climate risks. The calculation of climate finance included 33 % of eligible civil works budget and 5% of eligible equipment to have come up with conservative estimates of climate investments.
- **ExACT for estimating GHG emission reduction**. The project team utilized ExACT, a carbon emission calculator developed by FAO, and have found that (i) afforestation through shelterbelt planting is estimated to reduce annual emissions by 449,086 tCO2-eq; and (ii) conversion to perineal tree crops from another crop or degraded lands is estimated to reduce annual emissions by 18,086 tCO2-eq.

CAM: Uplands Irrigation and Water Resources Management Sector Project

- ADB financing: *$60 million*
- Climate change Risk: *Medium*
- **Vulnerability Context:** Droughts intensified by climate change may further reduce availability of water and agricultural productivity, particularly during periods of peak requirements [RRP]
- **Statement of Intent:** The project will increase agricultural production by rehabilitating, modernizing and climate-proofing selected irrigation systems in Kampong Thom and Battambang [RRP para 12]
- **Adaptation Measures:** 1) Irrigation scheduling to reduce impacts of droughts; 2) water discharge measurements installed in canals to meet crop water requirement during drought; 3) training on high value crops

Adaptation Financing: $2.4 million (4%)

Agribusiness value chains in CAM

- Objective: To increase ag competitiveness in a changing climate
- Vulnerability context: several links in value chains are vulnerable to CC impacts
- Qualifying elements: RE, climate proofing of production and post-harvest infra; CSA policy and capacity building
- Climate finance: A: $10 million; M: $5 million of the total ADB financing of $90 million
- **ExACT for estimating GHG emission reduction**. Conservative estimate of annual emission reductions by 550,000 tCO2-eq;

FIP Indonesia: GHG Emissions and Incremental Reduction (‘000 tCO2e)

Project Year	1	2	3	4	5	6	7	8	9	10	Total
Without-Project											
Emissions Sources											
Deforestation	484	484	484	484	484	484	484	484	484	484	4,843
Degradation	11	11	11	11	11	11	11	11	11	11	112
Forest fires	745	745	745	745	745	745	745	745	745	745	7,446
Total Carbon Emission	1,240	1,240	1,240	1,240	1,240	1,240	1,240	1,240	1,240	1,240	12,401
With-Project											
Emissions Sources											
Deforestation	436	421	407	392	378	363	349	334	320	305	3,705
Degradation	10	10	10	9	9	9	9	8	8	8	90
Forest fires	596	588	581	573	566	558	551	544	536	529	5,622
Carbon Sequestration											
Assisted natural regeneration	-22	-45	-67	-67	-67	-67	-67	-67	-67	-67	-605
Agroforestry	-2	-5	-8	-12	-16	-20	-20	-20	-20	-20	-141
Total Carbon Emission	1,017	970	922	896	870	844	821	799	777	755	8,671
Incremental Reduction											
Reduction from Prevention Activities											
Avoided deforestation	48	63	77	92	107	121	136	150	165	179	1,138
Avoided degradation	1	1	2	2	2	2	2	3	3	3	21
Avoided forest fires	149	156	164	171	179	186	194	201	208	216	1,824
Carbon Sequestration											
Assisted natural regeneration	22	45	67	67	67	67	67	67	67	67	605
Agroforestry	2	5	8	12	16	20	20	20	20	20	141
Total Incremental Reduction	223	270	318	344	370	396	419	441	463	485	3,730

Concluding Remarks

- More CSA projects
- Use climate funds to mainstream climate concerns into ANR sector projects
- New funding mechanisms and models to support CSA projects
- Climate finance tracking in ANR projects
- Consensus within ADB and with DMCs on eligible and ineligible activities for climate finance tracking
- M&E of climate benefits of CSA projects
- MRV of climate finance in CSA projects

Prepared by SDCC-AR
28 June 2017

Project Examples

Adaptation Example: PRC Jiangxi Xinyu Kongmu River Watershed Flood Control and Environmental Improvement

Objective. To improve life quality and better manage intensifying flood and environmental risks due to climate change, the project will invest in integrated and climate-resilient flood and environmental management and water pollution management systems.

Vulnerability. the climate change risks on water systems in Xinyu, including water availability, water supply, sewer and wastewater treatment systems, have been identified. Estimations of rainfall intensity, the key valuable that influence project design, based on three different climate models under a mid-range emission scenario has indicated the changes in the range from – 2% to + 12%.

Adaptation investment. For the project design an increased flow by 15% has been assumed to adequately address estimated climate change risks. The structures for drainage network, flood protection works and wetland have been designed under this increase flow assumption, and *the additional costs of addressing the climate risks are calculated* by comparing the relevant investment costs with this increased flow assumption and the ones under business as usual scenario.

No.	Calculated increase in design flows of 15% due to climate change	Changes in design to address the risk	Additional cost (million CNY)
1	increase in the water level of canals 0-0.15m	Increase of the top of canals reinforcement 0-0.2m	1.62
2	General increase in flood levels about 0.28m	increase of the top of channel embankment 0.27m	0.35
3	increase in stormwater 15%	increase of width of rainwater sub-surface utility tunnel from 1.8 m to 2.4m	11.58
4	increase in stormwater treated by wetland 1633 t/d	expanding wetland area by 1.93 ha	4.45
Total			**18.0**

Adaptation Example: PAK: Pehur High Level Canal Extension Project ($89.34 million)

Objective: To increase available water for agriculture-use, and to improve water-use skills and farm management capacity for new irrigated area, the proposed project will finance the extension of existing Pehur High Level Canal irrigation system for a population of about 75,000.

Climate Change Impacts: changes in temperature and water resources availability will generate a nominal additional water requirement which can be accommodated within the existing designed canal capacity. No negative effect on agriculture production is expected. flood events are likely to increase, and the cross-drainage structures will need to be designed for higher discharges.

Adaptation measures

- Increased capacity of cross-drainage structures for flood passage (design for meeting 10% additional discharge through cross-drainage structures. In addition, for all major crossings, return-period of 100-year has been adopted.)
- Farmer's capacity building for introduction of water saving technologies, farmers' field visits and establishment of demonstration centers.

Item	Details	Cost (Rupees million)
Cross-Drainage Structures	Aqueducts, Syphons, Drainage Culverts, Super passages	15.0
Farmers Capacity Building	Demonstration plots	30.0
	Introduction of high efficiency irrigation systems	42.5
	Farmers' field visits	1.1
Total		**88.6**
Total (USD million)		**0.84**

Climate Smart Agriculture Example: PRC: Fujian Farmland Sustainable Utilization and Demonstration ($100 million)

Climate risk and vulnerability:

- Water stress and higher water demand of crops due to higher temperatures
- Low water availability for rain-fed crops and low water availability for irrigation from local catchments and water bodies due to lower rainfall; and (iii) increased crop diseases and insect pests due to warmer conditions

Adaptation:

- Adoption of local and drought-resistant crop varieties that can withstand a wider range of temperatures
- Water-saving practices including sprinkle and drip irrigation, establishment of shelterbelts of trees around tea and tea-oil plantations
- Climate disaster prevention, such as warning system, pest control and drought monitoring
- On-farm water storage capacity to buffer droughts

Mitigation:

- On-farm advisory for prevision agriculture that contribute to GHG emission reduction including: (i) reduced use of fertilizer and pesticides; (ii) saving of irrigation water and intermittent irrigation for rice
- forage grass and leguminous forage and sustainable forestry management which will increase carbon sequestration

Calculation of climate investment	Adaptation ($ Million)	Mitigation ($ Million)
civil works attributed to qualifying activities (33% of ADB-financed civil work contracts) + equipment budget attributed to qualifying activities (50% of ADB financing for equipment	31	
Mitigation finance is estimated as the sum of ADB-financing costs of civil works, equipment and materials to support all eligible activities.		21.4* This amount was not included in the final RRP

Adaptation Example: IND: Climate Adaptation in Vennar Sub-basin in Cauvvery Delta Project ($100 million)

Climate risk and vulnerability: Costal districts in Cauvery delta, the rice bowl of Tamil Nandu, are prone to cyclones and flooding that are exacerbated by climate change

Adaptation: Entire project design was carried out based on estimated impacts based on climate modeling.

Calculation of climate investment	Adaptation ($ Million)
In consultation with the Climate Change Adaptation team, 50% of the project cost has been categorized as adaptation finance.	50

Adaptation calculation example: PRC: Xinjiang Karamayi Sustainable Agroforestry Development Project

Incremental Costs	Total Component Cost (million USD)	Approx cost (%) Infrastructure/ Equipment	Approx cost (%) technical advice/ outreach/ training	% of infrastructure attributed to adaptation	% of technical attributed to adaptation	Approx. cost infrastructure (col. E x col. C)	Approx. cost technical (col. F x col. D)	Subtotal adaptation cost
Output 1: Water conservation and management for the KACDZ improved - Adaptation Activities	32.4	30.78	1.62	5%	75%	1.54	1.22	2.75
Enhancement of irrigation in Area-1: Replacement of dysfunctional water meters and installation of new electromagnetic water meters		(95%)	(5%)					
Reuse of Treated Wastewater in Area-I: A total of 13.66 km distribution laterals , separate field application system. In total 6 distribution pipelines with diameters from 355 to 500 mm								
New irrigation systems: 168 water meters which can be manually or automatically and remotely measured								
Support for implementation of KMG Water Policy: i) developing systems of water accounting and monitoring for the water supply service company at KACDZ level, including water metering; ii) developing fees and tariffs for volumetric charging for water which will not affect the necessary leaching but will encourage water savings; and iii) customer services and customer support and complaint procedures. Beneficiary training modules will be developed by the project implementation consultant (PIC) for i) irrigation scheduling and salinity control and ii) cooperation of beneficiaries in water distribution, for example through small water user groups at the tertiary outlet level.								
Output 2: Sustainable Agroforestry for Arid Ecosystems implemented in KACDZ - Adaptation Activities	60.3	59.697	0.603	25%	100%	14.92	0.60	15.53
i) construction of a drainage system that will help lower ground water levels, improve topsoil stabilization, and reduce salinity in Area-I, and construction of a drainage system in Area-II to avoid rise of the groundwater table into the root zone and prevent future secondary salinization; ii) increase production through establishment of 100,000 mu (6,667 ha) agroforestry land in Area-II, including provision of small supporting infrastructure facilities; (iii) improved existing agroforestry practices in KACDZ Area-I, with a focus on water conservation approaches; and (iv) efficient management and disposal of drainage water. Through this component, the project will showcase innovative approaches for environmentally sustainable climate resilient agriculture and water-use.		(99%)	(1%)					
Output 3: Inclusive development in the KACDZ strengthened - Adaptation Activities								
(i) institutional and policy support; (ii) inclusive livelihood activities; (iii) training for sustainable agroforestry , including sustainable practices in livestock and husbandry, food quality and safety, climate and drought-resistant cropping, on farm water management and water saving, food quality and hygiene, green and organic production, integrated pest management, health and safety, salinity control, O&M of irrigation and drainage systems, environmental management, grievance redress mechanism (GRM) and client orientation and customer support.								
Output 4: Project management support provided - Adaptation Activities	7.3		42.8	0%	19.7%	0.00	8.43	8.43
(i) support and training in technical elements for project implementation including project planning, coordination of construction activities and contractors, and supervision of works and quality control. (ii) support for capacity development and training of the PMO and PIO in ADB project management procedures, technical design, project implementation, and safeguard supervision and monitoring, and (iii) support and training in financial management and procurement activities. Also include contingency, interest, and environmental monitoring.		‹#›	(100%)		based on % of Outputs 1-3/ divided by project total cost			
Total	**100**							**26.71**

Climate-Smart Agriculture (ADB)

- For irrigation projects: Land leveling + drought resilient and high yielding rice varieties + AWD (BAN)
- Agroforestry (Shading trees) + inclusive coffee value chain development (TIM, NEP)
- For watershed management: tree planting and cover crops for soil and water retention + prevision agriculture+ pest and extreme weather monitoring and warning (PRC)
- Supplementary irrigation (solar powered sprinkler irrigation) + precision agriculture + diversification into high value agriculture (dryland agriculture, PRC and CWRD)

Climate-Smart Agriculture (FAO, IFC, WB)

- **Ag research and dissemination of special breeds** of high yielding dairy cows for farmers to reduce then number of livestock and prevent grazing damage to crops while increasing their income
- **Ecological shrimp-mangrove forests** in Vietnam: protection of vulnerable costal communities + organic/safe farming products for higher value + protection of costal natural resources
- **Intercropping annual food crops with forests**: flexible switching rice/field crop system to grapes and fruit & industrial trees depending on weather (income diversification, control soil erosion, improve ecosystem, carbon sequestration)
- **Technology applications, capacity building and training** for reduction of losses, productivity improvement or feed-to-food conversion efficiency in livestock and aquaculture value chain investments (improved animal health, genetics, feeding practices, storage facilities, cold chains etc.)
- **Sustainable crop intensification t**o increase food production without expansion of agricultural land into forests (higher yielding seeds, efficient irrigation, storage facilities, appropriate use of fertilizer and precision farming)

Adaptation or not?

- **Policy change**: water tariff change from seasonal flat fee to usage based

- **Administrative reform**: shorting the national release of drought resilient & high yielding varieties from 5 yrs to 2.5 yrs.

- **Regional food trade liberalization** and logistics investments to improve of flow of food that reduce the risks of food price hike

- **Results-based lending**

2017 Sector Pipeline (ADB fund only)
$ million

Country	Project Name	Amount	Other Sector(s) Covered	Adaptation Finance	Mitigation Finance
KAZ	Irrigation Rehabilitation Project	250.00		14.750	
TAJ	Achieving Food Security through Climate Resilience Dairy Value Chain Development	24.50		5.000	
TAJ	Achieving Food Security through Climate Resilience Dairy Value Chain Development	10.50			
PRC	Air Quality Improvement in the Greater Beijing-Tianjin-Hebei Region-CECEP's Regional Emission Reduction and Pollution Control Facility	500.00	Energy (primary); Transport		100.000
PRC	Guizhou Rocky Desertification Area Water Management Project	150.00		7.697	7.306
PRC	Shanxi Urban-Rural Water Source Protection and Environmental Demonstration Project	100.00	Transport; Water and other urban infrastructure and services	18.520	3.250
BHU	Amochhu Land Development and Township Project (Phase 1)	28.74	Water and other urban infrastructure and services	2.000	
BHU	Amochhu Land Development and Township Project (Phase 1)	24.26	Water and other urban infrastructure and services		
IND	Sustainable Coastal Protection and Management Investment Program - Tranche 2	65.50		50.000	

2017 Sector Pipeline (ADB fund only)
$ million (cont…)

Country	Project Name	Amount	Other Sector(s) Covered	Adaptation Finance	Mitigation Finance
CAM	Tonle Sap Poverty Reduction and Smallholder Development Project - Additional Financing	45.73		10.480	
CAM	Tonle Sap Poverty Reduction and Smallholder Development Project - Additional Financing	4.29			
INO	Integrated Participatory Development and Management of Irrigation Program	500.00		30.000	
LAO	Northern Rural Infrastructure Development Sector Project - Additional Financing	35.60	Transport	5.000	
VIE	Basic Infrastructure for Inclusive Growth Sector Project in the Northeast Provinces	150.00	Transport (primary)	7.200	5.600
VIE	Heilongjiang Green Urban and Economic Revitalization Project	310.00	Energy; Finance; Industry and trade; Transport; Water and other urban infrastructure and services	40.760	27.430
PRC	Shanxi Inclusive Agricultural Value Chain Development Project	100.00		8.970	4.440
PHI	Infrastructure Preparation and Innovation Facility	100.00	Transport		