

When Does Climate Adaptation Capacity Shift Agricultural Support toward Sustainability-Oriented Instruments under Drought Conditions? Evidence from OECD

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Supplementary Materials

Supplementary Materials S.1

Supplementary Table S1 reports the OECD support-item mapping used in the construction of the dependent variable.

Table S1. Mapping of OECD support categories used in the construction of the dependent variable.

Category Group	OECD Code	Included in Main DV	Short Rationale
Aligned	F1	Yes	Long-term resource and ecosystem-related support
Aligned	F2	Yes	Non-commodity environmental/public-good output
Aligned	F3	Yes	Agri-environment and other non-commodity criteria
Aligned	H1	Yes	Knowledge generation and innovation capacity
Aligned	H2	Yes	Extension, education, and knowledge transfer
Aligned	J1	Yes	Hydrological infrastructure relevant to drought adaptation
Excluded	B3	No	Heterogeneous content across countries
Excluded	E	No	Not clearly maladaptive in all contexts

Note: The mapping is based on the OECD Producer and Consumer Support Estimates Database [6].

Supplementary Materials S.2

Supplementary Table S2. Table S2 summarises the primary policy documents, break years, and scoring rationales used in coding the ACI indicators by country and sub-index. The three sub-indices are ACI_GOV, ACI_RISK, and ACI_FIN. Each sub-indicator is scored on a 0–2 ordinal scale, with sub-index scores ranging from 0 to 8. The documents listed in the “Primary Policy Document” column are provided as documentary evidence for the ACI

coding decisions, break years, and scoring rationale. They are not cited as separate bibliographic references in the Supplementary Materials text but are reported within Table S2 to ensure transparency and reproducibility of the coding procedure.

Table S2. ACI Coding Inventory

Country	Component	Indicator	Break Year	Score	Primary Policy Document	Scoring Rationale
AUSTRALIA (AUS)						
AUS	ACI_GOV	GOV1_STRAT	2007, 2021	0→1→2	National Climate Change Adaptation Framework - COAG (2007); National Climate Resilience and Adaptation Strategy 2021–2025; National Adaptation Plan (2025)	No clear national adaptation strategy existed before 2007 (0). The 2007 COAG framework established a first-generation national adaptation framework (1). The 2021 strategy, reinforced by the 2025 National Adaptation Plan, indicates a mature second-generation framework (2).
AUS	ACI_GOV	GOV2_AG-RINT	2009, 2021	0→1→2	State Adaptation Plans (WA, SA, NSW, and Queensland agriculture adaptation frameworks, 2009+); National Climate Resilience and Adaptation Strategy 2021–2025 (primary industries); National Adaptation Plan (2025)	Before 2009, adaptation in agriculture was not systematically integrated (0). From 2009 onward, state-level plans introduced structured agricultural integration (1). The 2021 strategy and subsequent National Adaptation Plan indicate a mature level of sectoral integration (2).
AUS	ACI_GOV	GOV3_COORD	2007, 2013	0→1→2	COAG National Climate Change Adaptation Framework (2007); COAG Roles and Responsibilities Document (2012); National Climate Resilience and Adaptation Strategy 2021–2025	Before 2007, formal coordination arrangements were not clearly defined (0). The 2007 COAG framework introduced an initial coordination structure (1). By 2013, more clearly defined multi-level responsibilities signaled a mature coordination architecture (2).
AUS	ACI_GOV	GOV4_ME	2015, 2025	0→1→2	National Climate Resilience and Adaptation Strategy (2015); National Climate Resilience and Adaptation Strategy 2021–2025 (goal of assessing progress); National Climate Risk Assessment and National Adaptation Plan (2025)	Before 2015, no national monitoring and evaluation architecture was in place (0). The 2015 strategy introduced partial monitoring arrangements (1). The 2025 National Climate Risk Assessment and National Adaptation Plan establish a more mature monitoring and evaluation cycle (2).
AUS	ACI_RISK	RISK1	2007, 2025	0→1→2	National Climate Change Adaptation Framework (2007); NCCARF (2008); Adaptation Communication to the UNFCCC; National Climate Risk Assessment (2025)	Before 2007, no systematic national climate risk assessment framework existed (0). The COAG framework and NCCARF established an initial basis from 2007 onward (1). The 2025 National Climate Risk Assessment marks

AUS	ACI_RISK	RISK2	2007, 2022	0→1→2	Bureau of Meteorology national warning system; AFAC multi-hazard framework; Australian Warning System (AWS, 2022)	the first comprehensive national climate risk assessment and indicates mature risk assessment capacity (2). Before 2007, warning systems remained fragmented (0). From 2007 onward, the adaptation framework and Bureau of Meteorology systems provided an initial MHEWS infrastructure (1). The 2022 Australian Warning System established a standardised national multi-hazard warning architecture (2).
AUS	ACI_RISK	RISK3	2008, 2022	0→1→2	ABARES Weekly Climate, Water and Agriculture Report; Managing Climate Variability Program; Australian Agricultural Drought Indicators (AADI, 2022+)	Before 2008, drought management was largely event-based and lacked a systematic national framework (0). Reforms introduced from 2008 onward, together with monitoring tools, created an initial structured system (1). The 2022 AADI framework and the Future Drought Fund signal mature national drought monitoring capacity (2).
AUS	ACI_RISK	RISK4	2007, 2019	0→1→2	NCCARF (2008, agricultural climate research); Managing Climate Variability Program; Climate Services for Agriculture under the Future Drought Fund (2019+)	Before 2007, centralised agrometeorological infrastructure remained limited (0). From 2007 onward, research and information systems created an initial institutional basis (1). The 2019 Future Drought Fund established more institutionalised climate services for agriculture (2).
AUS	ACI_FIN	FIN1_ENV	2008	1→2	Caring for our Country, Phase 1 (2008–2013, approx. AUD 2.25 billion); National Landcare Program, Phase 2 (2014–2023); Climate-Smart Agriculture Program (AUD 302 million, 2022+)	During 2005–2007, Landcare already provided a medium level of agri-environmental support (1). From 2008 onward, Caring for our Country expanded this into a large-scale natural resource management and environmental funding structure (2).
AUS	ACI_FIN	FIN2_RISK	-	1	Farm Management Deposits (FMD) Scheme; Farm Household Allowance; concessional loans; disaster recovery payments	Australia did not operate a state-subsidised multi-risk agricultural insurance system during 2005–2023; instead, it relied on a changing mix of non-insurance risk-management instruments, corresponding to a medium level of capacity (1).
AUS	ACI_FIN	FIN3_INV	2008, 2015	0→1→2	Sustainable Rural Water Use and Infrastructure Program (SRWUIP); Hydrologic Monitoring Systems Modernisation (AUD 80 million, 2007–2012); National Water Infrastructure Development Fund (2015)	Before 2008, infrastructure investment remained largely conventional and not clearly adaptation-oriented (0). From 2008 onward, SRWUIP (1) and hydrological monitoring modernisation introduced large-scale climate adaptation infrastructure, indicating mature investment capacity (2).

AUS	ACI_FIN	FIN4_P ROG	2019	1→2	Managing Climate Variability Program (2000s onward); Caring for our Country / National Landcare Program; Future Drought Fund (2019, AUD 3.9 billion)	Between 2005 and 2018, Australia already had adaptation-related programme activity through the Managing Climate Variability and Landcare frameworks, but lacked a permanent national adaptation fund (1). The 2019 Future Drought Fund established a durable, nationally funded adaptation programme architecture (2).
CANADA (CAN)						
CAN	ACI_GOV	GOV1_ STRAT	2010, 2022	0→1→2	Federal Adaptation Framework (2011); National Strategy for Critical Infrastructure (2011); National Adaptation Strategy (2023)	Before 2010, adaptation remained fragmented at the federal level (0). The 2011 federal framework established an initial national strategic basis (1). The 2023 National Adaptation Strategy marked a mature national framework (2).
CAN	ACI_GOV	GOV2_ AG- RINT	2011, 2016	0→1→2	Climate Change Adaptation Platform – Agriculture Working Group (2012+); Pan-Canadian Framework on Clean Growth and Climate Change (2016, agriculture-related components)	Before 2011, adaptation was not clearly integrated into the agricultural sector (0). From 2011 onward, agriculture began to be incorporated through dedicated platform structures (1). The 2016 Pan-Canadian Framework signaled stronger sectoral integration (2).
CAN	ACI_GOV	GOV3_ COOR D	2007, 2012	0→1→2	Federal-Provincial-Territorial (FPT) coordination mechanisms (2007+); Climate Change Adaptation Platform (2012); National Adaptation Strategy Implementation Plan (2023)	Before 2007, coordination was not clearly institutionalised (0). Federal-provincial-territorial coordination mechanisms created an initial structure from 2007 onward (1). The 2012 Platform broadened this into a more mature multi-level coordination framework (2).
CAN	ACI_GOV	GOV4_ ME	2020, 2023	0→1→2	A Healthy Environment and a Healthy Economy (2020, commitment to a national adaptation strategy); Adaptation Action Plan (2022); National Adaptation Strategy (2023, 22 targets and 13 indicators)	Before 2020, no systematic national monitoring and evaluation framework was in place (0). The 2020 plan created an initial basis by committing to a national adaptation strategy and related monitoring architecture (1). The 2023 National Adaptation Strategy established a more mature monitoring cycle with explicit targets and indicators (2).
CAN	ACI_RISK	RISK1	2007, 2022	0→1→2	Climate Change Adaptation Platform – Knowledge Working Group; National Adaptation Strategy (2023) risk assessment framework	Before 2007, no national climate risk assessment framework was in place (0). Working groups and platform-based initiatives introduced a partial assessment structure from 2007 onward (1). The 2022–2023 NAS process established a more systematic national risk framework (2).
CAN	ACI_RISK	RISK2	2009, 2022	1→2	Canadian Drought Monitor (CDM, 2002+, AAFC);	Canada already had a national drought monitoring tool through the

					North American Drought Monitor; AgriRecovery framework; Drought Early Warning System (DEWS, April 2022, ABARES)	CDM, although its agricultural focus remained limited (1). The 2022 DEWS strengthened early warning capacity through additional indicators and forecasting tools, moving this dimension to a more mature level (2).
CAN	ACI_RISK	RISK3	2012	0→2	Canadian Drought Monitor; AgriInsurance drought coverage; Growing Forward 2 drought adaptation components; Prairie monitoring systems	Before 2012, no fully institutionalised and agriculture-specific drought monitoring system was in place (0). From 2012 onward, federal-provincial monitoring systems, drought-related insurance coverage, and Prairie-based systems together supported a mature agriculture-oriented drought monitoring structure (2).
CAN	ACI_RISK	RISK4	2008	0→2	Agri-Food Climate Solutions; Growing Forward framework for agricultural climate information services; Prairies Climate Information System; AAFC climate services	Before 2008, centralised agrometeorological infrastructure remained limited (0). From 2008 onward, agricultural climate information and forecasting services expanded substantially, supporting a mature agrometeorological service structure (2).
CAN	ACI_FIN	FIN1_ENV	2008	1→2	Growing Forward (2008–2013); Growing Forward 2 (2013–2018); Canadian Agricultural Partnership (2018–2023); Sustainable CAP (2023–2028, CAD 250 million Resilient Agricultural Landscape Program)	During 2005–2007, Environmental Farm Plans and provincial BMP programmes provided a moderate level of agri-environmental support (1). The launch of Growing Forward in 2008 marked a shift toward large-scale national environment- and climate-related support (2).
CAN	ACI_FIN	FIN2_RISK	—	2 (fixed)	CAIS → Business Risk Management (BRM) package: AgriInsurance, AgriStability, AgriInvest, AgriRecovery (from 2007–2008 onward, throughout the period)	Through the CAIS system (2005–2007) and the BRM package from 2008 onward, Canada maintained a comprehensive, subsidised, and multi-component agricultural risk management system throughout the period (2).
CAN	ACI_FIN	FIN3_INV	2019	1→2	Agricultural Water Infrastructure Program (British Columbia and other provinces); drought adaptation water infrastructure under CAP (2018+); National Adaptation Strategy Adaptation Action Plan	During 2005–2018, Canada had a strong legacy of water infrastructure, but climate adaptation-oriented investment programmes were still limited (1). From 2019 onward, water and climate investments became more systematic within the broader adaptation framework (2).
CAN	ACI_FIN	FIN4_PROG	2021	1→2	Agricultural Climate Solutions (ACS, 2021, CAD 185 million over 10 years); On-Farm Climate Action Fund (OFCAF, CAD 200 million);	During 2005–2020, adaptation-related support existed through EFP, BMP, GF/GF2, and CAP-linked programme activities (1). In 2021, ACS, OFCAF, and ACT established a more durable

					Agricultural Clean Technology (ACT); Sustainable CAP	national programme architecture for climate adaptation in agriculture (2).
CHILE (CHL)						
CHL	ACI_GOV	GOV1_STRAT	2006, 2014	0→1→2	Estrategia Nacional de Cambio Climático (2006); PANCC 2008–2012; Plan Nacional de Adaptación – PNACC (2014); Ley Marco de Cambio Climático (2022)	No national strategy existed before 2006 (0). The 2006 strategy established a first-generation national framework (1). The 2014 PNACC, reinforced by the 2022 climate law, marked full institutionalisation (2).
CHL	ACI_GOV	GOV2_AG-RINT	2013	0→2	Plan de Adaptación al Cambio Climático del Sector Silvoagropecuario (2013, 21 measures); PANCC SAP 2023–2027	No agricultural adaptation integration existed before 2013 (0). The 2013 sectoral adaptation plan introduced comprehensive integration for agriculture and forestry (2).
CHL	ACI_GOV	GOV3_COORD	2013, 2017	0→1→2	PANCC (2008–2012); NAP (2014); CORECC – Comités Regionales de Cambio Climático (2017+)	Coordination was fragmented before 2013 (0). Sectoral plans clarified institutional roles from 2013 onward (1). The creation of CORECC in 2017 established a mature multi-level governance structure (2).
CHL	ACI_GOV	GOV4_ME	2014, 2023	0→1→2	PNACC (2014, indicator set); ECLP (2021, Long-Term Climate Strategy 2050); PANCC SAP 2023–2027 (monitoring indicators)	No national monitoring and evaluation framework existed before 2014 (0). PNACC introduced a basic monitoring structure in 2014 (1). The 2023 SAP and climate law established a more mature monitoring and evaluation framework (2).
CHL	ACI_RISK	RISK1	2008, 2014	0→1→2	National Climate Change Plan 2008–2012; Plan de Adaptación Sector Silvoagropecuario (2013); PNACC (2014)	No national adaptation or risk assessment framework existed before 2008 (0). The 2008 national action plan introduced an initial framework (1). PNACC established a broader national risk assessment process in 2014 (2).
CHL	ACI_RISK	RISK2	2010, 2017	0→1→2	ONEMI (now SENAPRED); Sistema de Alerta de Emergencia – SAE (2012, Exenta 3261); nationwide SAE coverage on all mobile phones from 2017	Before 2010, early warning relied mainly on traditional sirens and local systems, without a digital multi-hazard structure (0). Between 2010 and 2016, the SAE system was designed and regulated (1). From 2017 onward, mandatory nationwide SAE coverage on mobile phones marked a mature MHEWS structure (2).
CHL	ACI_RISK	RISK3	2012, 2019	0→1→2	Observatorio Agroclimático de Riesgos (2012); Chilean Drought Observatory; multi-scale drought observatory (University of O'Higgins, satellite-based)	No agriculture-specific agroclimatic drought platform existed at the institutional level before 2012 (0). The Agroclimatic Observatory introduced maps and indicators in 2012 (1). From 2019 onward, satellite integration signaled a

CHL	ACI_RISK	RISK4	2012, 2016	0→1→2	Boletín Agroclimático Mensual (DMC); Perspectiva Agroclimática Estacional; Agroclima.cl (INIA, DMC); Manual de Agrometeorología (DMC, 2022)	mature national drought monitoring system (2). Systematic agroclimatic services were fragmented before 2012 (0). Monthly bulletins and seasonal agroclimatic outlooks during 2012–2015 marked an initial stage, though institutionalisation remained limited (1). From 2016 onward, DMC–INIA cooperation created a more comprehensive agricultural climate service structure (2).
CHL	ACI_FIN	FIN1_ENV	2010	1→2	SIRSD-S – Law No. 20.412 (2010, agro-environmental soil incentive system); SIG-ESS (2020s, renewed phase)	Soil improvement programmes existed at a moderate level during 2005–2009 (1). The 2010 SIRSD-S established a national-scale agro-environmental incentive system (2).
CHL	ACI_FIN	FIN2_RISK	2010	1→2	Agroseguros / Programa de Seguro Agrícola (CORFO, since 2000); premium subsidies of 40–69%, up to 95% for INDAP beneficiaries	During 2005–2009, the agricultural insurance system remained in an earlier development phase with more limited coverage (1). From 2010 onward, a mature subsidised multi-risk system was in place (2).
CHL	ACI_FIN	FIN3_INV	2015	1→2	CNR Irrigation Incentive Law (Law 18.450); INDAP Programa de Riego; Adaptation Fund – O'Higgins Project (irrigation, water harvesting, agro-climatic observation)	Irrigation incentives existed before 2015, but the climate adaptation framing remained partial (1). From 2015 onward, Adaptation Fund projects and modernised irrigation infrastructure elevated this dimension to a mature level (2).
CHL	ACI_FIN	FIN4_PROG	2010, 2020	0→1→2	PANCC 2008–2012; SAP Silvoagropecuario (2013); PNACC (2014); LTS 2050 (2021); GCF-supported SAP update (2021+)	No adaptation programme framework existed before 2010 (0). Between 2010 and 2019, national strategies and the first sectoral plan supported an emerging programme structure (1). From 2020 onward, updated PNACC arrangements and the long-term strategy signaled a more institutionalised adaptation programme architecture (2).
EUROPEAN UNION (EU28)						
EU28	ACI_GOV	GOV1_STRAT	2009, 2013	0→1→2	White Paper: Adapting to Climate Change (COM/2009/147); EU Adaptation Strategy COM(2013)216; New EU Adaptation Strategy (2021, Forging a Climate-Resilient Europe); European Climate Law (Reg. 2021/1119)	Before 2009, no clearly defined EU-level adaptation strategy was in place (0). The 2009 White Paper created an initial EU adaptation framework (1). The 2013 Adaptation Strategy, later reinforced by the 2021 European Climate Law and the new Adaptation Strategy, marked a mature institutional framework (2).

EU28	ACI_GOV	GOV2_ AG- RINT	2014, 2021	0→1→2	CAP 2014–2020 (objective on climate action and natural resource management); CAP 2023–2027 (explicit objective on climate change adaptation and resilience); Member State CAP Strategic Plans	Before 2014, the CAP did not include a systematic adaptation orientation (0). CAP 2014–2020 introduced climate adaptation into the agricultural policy architecture (1). CAP 2023–2027 and the associated strategic plans reflect a more mature and explicit integration of adaptation and resilience (2).
EU28	ACI_GOV	GOV3_ COORD	2013	1→2	DG ENV/DG CLIMA coordination structures; Climate-ADAPT platform (2012); EU Adaptation Strategy (2013); Governance Regulation (Reg. 2018/1999); European Climate Law (2021)	During 2005–2012, the European Commission and DG ENV/DG CLIMA provided an initial coordination basis (1). From 2013 onward, the Adaptation Strategy, Governance Regulation, and Climate Law strengthened multi-level coordination and produced a more mature governance structure (2).
EU28	ACI_GOV	GOV4_ ME	2013, 2018	0→1→2	EU Adaptation Strategy (2013); Adaptation Preparedness Scoreboard (2018); Governance Regulation (Reg. 2018/1999); European Climate Law (2021)	Before 2013, no EU-level monitoring and evaluation framework for adaptation was in place (0). The 2013 strategy and Climate-ADAPT created a partial monitoring basis (1). From 2018 onward, the Scoreboard and the Governance Regulation established a more mature M&E infrastructure (2).
EU28	ACI_RISK	RISK1	2013, 2021	1→2	EEA climate impact and vulnerability reports (2004, 2008, 2012, 2016); EU Adaptation Strategy (2013); new EU Adaptation Strategy (2021); European Climate Risk Assessment (EU-CRA/ACRA, 2024)	During 2005–2012, the EEA had already built an EU-level knowledge base on climate impacts and vulnerability, but a more systematic cyclical risk assessment framework was still emerging (1). From 2021 onward, the new Adaptation Strategy and the 2024 European Climate Risk Assessment indicate a mature and recurring risk assessment structure (2).
EU28	ACI_RISK	RISK2	2013	1→2	CECIS – Common Emergency Communication and Information System; ERCC – Emergency Response Coordination Centre (strengthened in 2013); EU Civil Protection Mechanism; Sendai Framework implementation	During 2005–2012, the EU already had civil protection coordination tools, but the integrated multi-hazard warning and coordination system was not yet fully mature (1). From 2013 onward, the strengthened ERCC and broader integration under the Civil Protection Mechanism indicate a mature multi-hazard early warning and coordination framework (2).
EU28	ACI_RISK	RISK3	2011, 2015	0→1→2	European Drought Observatory (EDO, JRC); Global Drought Observatory (GDO); Copernicus Emergency Management Service (CEMS); European	During 2005–2010, EDO remained closer to a prototype phase and a fully institutionalised drought monitoring system was not yet in place (0). Between 2011 and 2014, EDO became operational and provided maps and

					Flood Awareness System (EFAS)	drought indicators (1). From 2015 onward, GDO and CEMS indicate a more mature EU-level drought monitoring and early warning system (2).
EU28	ACI_RISK	RISK4	—	2 (fixed)	MARS – Monitoring Agricultural Resources (JRC); MCYFS – MARS Crop Yield Forecasting System; Copernicus Land Monitoring Service; EFFIS – European Forest Fire Information System	The EU has maintained a long-established agricultural climate and crop monitoring infrastructure through JRC/MARS since well before the study period. Strengthened by Copernicus-related services, this dimension remains at a high level throughout the full period (2).
EU28	ACI_FIN	FIN1_E NV	2014, 2021	0→1→2	EAFRD agri-environment and climate measures; CAP 2014–2020 (Greening and Pillar II climate/environment allocation rules); CAP 2023–2027 (minimum 25% eco-schemes in Pillar I and minimum 35% environment/climate allocation in Pillar II)	During 2005–2013, the EAFRD already included environmental measures, but the overall green architecture was less dominant (1). From 2014 onward, Greening and climate/environment allocation rules strengthened the environmental component, and CAP 2023–2027 further elevated this dimension to a mature level (2).
EU28	ACI_FIN	FIN2_R ISK	—	1 (fixed)	CAP 2014–2020 EAFRD risk management toolkit (insurance premium support, mutual funds, Income Stabilisation Tool); CAP 2023–2027 risk management instruments; Member State insurance systems	The CAP includes risk management tools, but their use and budgetary significance remain more limited than in countries with broad subsidised agricultural insurance systems such as Canada or the United States. This dimension therefore remains at a medium level throughout the period (1).
EU28	ACI_FIN	FIN3_I NV	2013	1→2	EAFRD 2007–2013 (irrigation modernisation and water management); EAFRD 2014–2020 (climate mainstreaming); EIB water-resources commitment; CAP 2023–2027 climate-resilient investment measures	During 2005–2012, the EAFRD already supported agricultural infrastructure investment, but climate mainstreaming remained more limited (1). From 2013 onward, EU funds increasingly supported climate-resilient infrastructure, indicating a mature adaptation-related investment framework (2).
JAPON (JPN)						
JPN	ACI_GOV	GOV1_ STRAT	2015, 2018	0→1→2	National Climate Change Adaptation Plan (2015); Climate Change Adaptation Act (2018, mandatory five-year revision cycle); 2nd Climate Change Impact Assessment (2020)	No comprehensive national adaptation strategy existed before 2015 (0). The 2015 National Adaptation Plan established a first-generation framework (1). The 2018 Adaptation Act created a legal basis and a more mature institutional structure (2).
JPN	ACI_GOV	GOV2_ AG- RINT	2015, 2021	0→1→2	MAFF Climate Change Adaptation Plan (2015, ag-	Before 2015, no systematic integration of adaptation into agriculture was in place (0). The 2015 MAFF plan introduced sectoral integration (1). The

					riculture/forestry/fisheries); revisions in 2018 and 2021; KPI set (2021)	2021 revision and KPI framework indicate a mature level of integration (2).
JPN	ACI_GOV	GOV3_COORD	2014, 2018	0→1→2	Fundamental Plan for National Resilience (2014); Climate Change Adaptation Act (2018, local adaptation centers and local action plans)	Before 2014, no clearly defined adaptation coordination structure existed (0). The 2014 national resilience framework created an initial coordination architecture (1). The 2018 Adaptation Act strengthened multi-level governance and coordination (2).
JPN	ACI_GOV	GOV4_ME	2015, 2018	0→1→2	1st Climate Change Impact Assessment (2015); Adaptation Act (mandatory review every five years); 2nd Impact Assessment (2020); KPI set (2021)	No national monitoring and evaluation framework existed before 2015 (0). The 2015 impact assessment introduced a partial assessment cycle (1). The 2018 Adaptation Act established a regular, cyclical monitoring and evaluation structure (2).
JPN	ACI_RISK	RISK1	2015, 2018	0→1→2	First Climate Change Impact Assessment (Ministry of the Environment, March 2015); National Plan for Adaptation (November 2015); Climate Change Adaptation Act (June 2018); A-PLAT national adaptation platform	Before 2015, no cyclical national climate risk assessment framework was in place (0). The first impact assessment and national adaptation plan established an initial national framework in 2015 (1). The 2018 Adaptation Act institutionalized a legally grounded five-year assessment cycle (2).
JPN	ACI_RISK	RISK2	2013	1→2	J-Alert (2004); Japan Meteorological Agency national warning system; risk-based seamless warnings from 2013 onward; recognized by WMO/UNDRR as a good-practice MHEWS case	During 2005–2012, Japan had strong warning systems, but they were more hazard-specific in structure (1). From 2013 onward, risk-based seamless warnings and stronger system integration indicate a mature multi-hazard early warning system (2).
JPN	ACI_RISK	RISK3	2010, 2017	0→1→2	MAFF adaptation documents on drought measures; hydrometeorology-agricultural drought monitoring and prediction; DMEWS (satellite-based drought monitoring and early warning system); JASMAI	Before 2010, agricultural drought monitoring remained largely research-based and lacked an operational national system (0). Between 2010 and 2016, research and initial monitoring infrastructure emerged (1). From 2017 onward, JASMAI and updated MAFF adaptation planning indicate a mature monitoring system (2).
JPN	ACI_RISK	RISK4	2015	1→2	NARO 1 km grid agrometeorological database; JMA seasonal temperature forecasting services; MAFF agricultural weather advisories; advanced agrometeorological database and crop models	During 2005–2014, Japan already had strong meteorological services, but a fully risk-oriented agricultural climate service architecture was still limited (1). From 2015 onward, high-resolution, risk-oriented agricultural climate

						services and the NARO grid system indicate a mature institutional structure (2).
JPN	ACI_FIN	FIN1_ENV	—	1 (fixed)	Agri-Environmental Direct Payments (gradual expansion); Midori no Shokuryo System Strategy (Green Food System Strategy, 2021)	Japan has maintained agri-environmental payments throughout the period, but not at the scale observed in the EU or Canada. This dimension therefore remains at a medium level throughout the period (1).
JPN	ACI_FIN	FIN2_RISK	—	2 (fixed)	Nosai Mutual Aid System; agricultural insurance reform (2019, Crop Insurance Act)	Japan's Nosai system is a long-established agricultural mutual aid and risk-sharing structure covering multiple risks. It is coded at a high-capacity level throughout the entire period (2).
JPN	ACI_FIN	FIN3_INV	—	1 (fixed)	Irrigation infrastructure renewal programmes; agricultural landscape management support; water management investments under the Adaptation Act	Japan has long maintained strong agricultural infrastructure investment capacity. However, large and continuous climate adaptation-oriented investment programmes remain more limited, so this dimension remains at a medium level (1).
JPN	ACI_FIN	FIN4_PROG	2015, 2022	0→1→2	MAFF Climate Change Adaptation Plan (2015); programme implementation under the Adaptation Act; Green Food System Strategy (2021); agricultural climate adaptation programmes from 2022 onward	Before 2015, no agriculture-specific adaptation programme architecture existed (0). The 2015 MAFF plan initiated programme-based adaptation activity (1). From 2022 onward, the Green Food System Strategy and related programmes indicate a more mature adaptation programme structure (2).
MEXICO (MEX)						
MEX	ACI_GOV	GOV1_STRAT	2007, 2012	0→1→2	ENACC 2007 (First National Climate Change Strategy); LGCC – Ley General de Cambio Climático (2012); PECC 2021–2024	No national adaptation strategy existed before 2007 (0). ENACC established a first-generation strategic framework in 2007 (1). The 2012 LGCC created a law-based national framework and marked a mature level of institutionalisation (2).
MEX	ACI_GOV	GOV2_AGRINT	2009	0→1	PECC 2009–2012 (adaptation targets for agriculture and productive sectors); PECC 2014–2018; climate-smart agriculture (CSA) frameworks	Before 2009, adaptation integration into agriculture was fragmented (0). The 2009 PECC introduced adaptation measures for agriculture and productive sectors, although full sectoral integration remained limited (1).
MEX	ACI_GOV	GOV3_COORD	2005, 2012	1→2	CICC – Inter-ministerial Commission on Climate Change (2005); SINACC – National Climate Change System (LGCC 2012); INECC	Federal coordination existed through CICC from 2005 onward (1). The 2012 LGCC established SINACC and strengthened multi-level coordination (2).

MEX	ACI_GOV	GOV4_ME	2009, 2021	0→1→2	PECC 2009–2012 and 2014–2018 (targets and indicators); PECC 2021–2024 (MRV and finance-monitoring framework)	No systematic monitoring and evaluation framework existed before 2009 (0). PECC introduced partial monitoring from 2009 onward (1). The 2021 PECC established a more mature MRV and evaluation infrastructure (2). During 2005–2006, Mexico lacked a national adaptation strategy and programme framework (0). ENACC and PECC established an initial national risk and adaptation framework during 2007–2011 (1). From 2012 onward, the LGCC provided a legal basis for a more comprehensive national risk and vulnerability assessment framework (2).
MEX	ACI_RISK	RISK1	2007, 2012	0→1→2	ENACC 2007–2012 and PECC 2009–2012; LGCC (2012); ENCC 2013; subsequent PECCs (2014–2018, 2020–2024); NAP process	During 2005–2014, Mexico had strong warning systems, but they remained largely hazard-specific and institutionally separate (1). From 2015 onward, stronger system integration and international recognition indicate a mature multi-hazard early warning system (2).
MEX	ACI_RISK	RISK2	2015	1→2	SASMEX – Seismic Early Warning System of Mexico; SIAT-CT – Tropical Cyclone Early Warning System; WMO/UNDRR recognition of Mexico as a good-practice MHEWS case (2015+)	Before 2011, no systematic national instrument for agriculture-relevant drought monitoring was in place (0). Between 2011 and 2015, the Monitor de Sequía entered operation but remained in a consolidation phase (1). From 2016 onward, it became a recognised national reference tool for drought monitoring and decision support (2).
MEX	ACI_RISK	RISK3	2011, 2016	0→1→2	Monitor de Sequía de México (MSM/MDM, launched in 2011); CONAGUA drought monitoring; national policy and technical documents using MSM as a reference tool	During 2005–2014, SMN provided weather and agrometeorological bulletins, but a more risk-oriented climate service architecture was still incomplete (1). From 2015 onward, SINA and CSA-related frameworks contributed to a more comprehensive agrometeorological service package (2).
MEX	ACI_RISK	RISK4	2015	1→2	SMN agrometeorological bulletins; WMO WAMIS portal; SINA and agroclimatic reports; CSA agrometeorological service package (2015+)	Mexico has maintained visible climate- and environment-oriented agricultural support throughout the period, but these instruments remained limited in scale and did not dominate the overall support composition. This dimension therefore remains at a medium level throughout the period (1).
MEX	ACI_FIN	FIN1_NV	—	1 (fixed)	COUSSA (Conservación y Uso Sustentable de Suelo y Agua); PSRN (Programa de Sustentabilidad de los Recursos Naturales); PECC-related agricultural environmental measures	

MEX	ACI_FIN	FIN2_RISK	—	2 (fixed)	CADENA – Programa de Atención a Contingencias Climatológicas; Seguro Agrícola Catastrófico (SAC); PSA – Programa de Subsidio a la Prima del Seguro Agropecuario	Mexico's CADENA and SAC architecture constitutes a broad public financing mechanism for agricultural climate disasters and has been widely recognised in the Latin American context. It is coded at a high-capacity level throughout the entire period (2). During 2005–2014, COUSSA and conventional irrigation investments provided a partial investment base, but a clearer climate adaptation orientation was still emerging (1). From 2015 onward, irrigation modernisation and technification programmes indicate a more mature climate- and water-oriented investment framework (2).
MEX	ACI_FIN	FIN3_INV	2015	1→2	COUSSA small-scale water and soil conservation infrastructure; Programa Nacional de Tecnificación de Riego; CSA-related agricultural investments	During 2005–2008, adaptation programming remained fragmented and PECC had not yet been introduced (0). Between 2009 and 2020, successive PECC cycles created a programme-based adaptation framework (1). The 2021 PECC consolidated this into a more mature, multi-sectoral programme architecture with indicators and monitoring provisions (2).
MEX	ACI_FIN	FIN4_PROG	2009, 2021	0→1→2	ENACC (2007); PECC 2009–2012; PECC 2014–2018; LGCC (2012, making PECC a legal requirement); PECC 2021–2024	
NEW ZEALAND (NZL)						
NZL	ACI_GOV	GOV1_STRAT	2019, 2022	0→1→2	Climate Change Response (Zero Carbon) Amendment Act 2019; 1st National Adaptation Plan – Adapt and Thrive (2022)	No national adaptation strategy existed before 2019 (0). The 2019 Zero Carbon Act created a legal framework for adaptation (1). The 2022 National Adaptation Plan established a full national adaptation planning architecture (2).
NZL	ACI_GOV	GOV2_AGRINT	2007, 2022	0→1→2	Sustainable Land Management and Climate Change Plan of Action (2007, adaptation pillar for agriculture and land use); National Adaptation Plan 2022 (primary sectors section)	Before 2007, no systematic integration of adaptation into agriculture was in place (0). The 2007 SLMCC Plan of Action introduced an adaptation focus for agriculture and land use (1). The 2022 National Adaptation Plan marks a more comprehensive and mature form of integration (2).
NZL	ACI_GOV	GOV3_COORD	2019, 2022	0→1→2	Zero Carbon Act 2019 (establishing the Climate Change Commission); National Adaptation Plan 2022 implementation framework	Before 2019, New Zealand lacked a coordinated national adaptation architecture (0). The 2019 Climate Change Commission provided an initial coordination mechanism (1). The 2022 National Adaptation Plan established a more mature multi-level governance framework (2).

NZL	ACI_GOV	GOV4_ME	2020, 2022	0→1→2	National Climate Change Risk Assessment (2020); Climate Change Commission progress reporting on the National Adaptation Plan (2024); national climate governance review (2024)	Before 2020, no national monitoring and evaluation architecture for adaptation was in place (0). The 2020 National Climate Change Risk Assessment initiated a cyclical assessment process (1). The 2022 National Adaptation Plan and subsequent Commission reporting established a more mature monitoring structure (2).
NZL	ACI_RISK	RISK1	2008, 2020	0→1→2	Ministry for the Environment, Preparing for Climate Change: A Guide for Local Government (2008); sectoral guidance during the 2010s; Zero Carbon Act (2019); National Climate Change Risk Assessment (2020); Adapt and Thrive National Adaptation Plan (2022)	During 2005–2007, the technical basis for adaptation policy was still emerging and no national risk assessment framework existed (0). Between 2008 and 2019, sectoral guidance and technical work created an initial institutional base (1). The 2020 National Climate Change Risk Assessment established a comprehensive and cyclical national risk assessment process (2).
NZL	ACI_RISK	RISK2	2015	1→2	GNS Science earthquake early warning; MetService national weather warning system; NEMA – National Emergency Management Agency (2019); MAR Centre – Multi-Hazard Assessment and Rapid Response Centre (2022)	During 2005–2014, New Zealand had sector-specific warning systems for earthquakes, weather, and tsunamis, but they were not yet fully integrated (1). From 2015 onward, stronger coordination through NEMA and the MAR Centre indicates a more mature multi-hazard early warning system (2).
NZL	ACI_RISK	RISK3	2012, 2017	0→1→2	NIWA Soil Moisture Deficit and SPI maps; NIWA drought reports on the 2012–2013 drought; New Zealand Drought Monitor / NZDI (MPI/NIWA); weekly drought maps and advisory information	Before 2012, meteorological drought information existed, but no operational national drought monitoring system specifically relevant to agriculture was in place (0). Between 2012 and 2016, NIWA's SMD and SPI products provided an initial monitoring structure (1). From 2017 onward, the New Zealand Drought Monitor became a national reference tool for drought monitoring (2).
NZL	ACI_RISK	RISK4	2015	1→2	NIWA weather and climate forecasting services; daily climate maps and drought indicators; weekly drought bulletin (MPI/NIWA) covering soil moisture, drought risk, and management advice	During 2005–2014, NIWA provided some agriculture-relevant climate services, but a regular and risk-oriented agrometeorological service architecture was still limited (1). From 2015 onward, more regular and risk-oriented services indicate a mature agricultural climate service structure (2).

NZL	ACI_FIN	FIN1_ENV	—	1 (fixed)	Sustainable Farming Fund; Hill Country Erosion Programme; Freshwater Farm Plans (2022+)	New Zealand has maintained visible agri-environmental support throughout the period, but generally at a medium level. This dimension therefore remains coded at 1 throughout the study period.
NZL	ACI_FIN	FIN2_RISK	—	1 (fixed)	Adverse Events Policy (for droughts and floods); private crop insurance products; Disaster Recovery Funding Arrangements	New Zealand does not operate a broad state-subsidised multi-risk agricultural insurance system. It has structured but relatively limited risk transfer and disaster support instruments, which are coded at a medium level throughout the period (1).
NZL	ACI_FIN	FIN3_INV	2012	1→2	Irrigation Acceleration Fund (2011 onward); Central Plains Water development; National Adaptation Plan 2022 priorities for climate-resilient water and irrigation infrastructure	Before 2012, irrigation investments existed but large climate adaptation-oriented programmes were limited (1). From 2012 onward, the Irrigation Acceleration Fund and related investment programmes indicate a more mature climate-relevant infrastructure investment framework (2).
NZL	ACI_FIN	FIN4_PROG	2007, 2022	0→1→2	SLMCC Plan of Action (2007); NIWA Climate Change Adaptation Toolbox; programmes under the Zero Carbon Act (2019); National Adaptation Plan 2022 implementation measures	During 2005–2006, no dedicated adaptation programme framework was in place (0). Between 2007 and 2021, SLMCC and research-based programme activity provided an initial programme structure (1). The 2022 National Adaptation Plan established a broader and more mature adaptation programme package (2).
NORWAY (NOR)						
NOR	ACI_GOV	GOV1_STRAT	2013, 2023	0→1→2	White Paper on Climate Change Adaptation in Norway, Meld. St. 33 (2012–2013); Climate Change Act (2017); Meld. St. 26 (2022–2023, updated strategy)	No national adaptation strategy existed before 2013 (0). The 2013 white paper established a first-generation national strategy (1). The 2023 updated strategy marks a second-generation and more mature framework (2).
NOR	ACI_GOV	GOV2_AGRINT	2013, 2023	0→1→2	Meld. St. 33 (2013, agriculture adaptation section); Meld. St. 26 (2023, updated agricultural resilience framework)	Before 2013, no clear agricultural adaptation integration was in place (0). The 2013 white paper introduced an adaptation focus for the agricultural sector (1). The 2023 update reflects a more mature integration of agricultural adaptation and resilience (2).
NOR	ACI_GOV	GOV3_COORD	2013	1→2	Civil protection framework and DSB (early coordination phase); Meld. St. 33 (2013, clarifying the role of municipalities and national coordination); Climate Change Act (2017, reporting obligations)	During 2005–2012, coordination existed through the civil protection framework (1). The 2013 white paper clarified institutional roles and strengthened national coordination, indicating a mature coordination structure (2).

NOR	ACI_GOV	GOV4_ME	2013, 2021	0→1→2	Meld. St. 33 (2013, initial monitoring mechanisms); Climate Change Act (2017, regular reporting); Norway's Adaptation Communication (2021, indicators); Meld. St. 26 (2023)	Before 2013, no national monitoring and evaluation framework for adaptation existed (0). The 2013 white paper introduced initial monitoring arrangements (1). By 2021, adaptation reporting and indicator-based communication had developed into a more systematic M&E structure (2).
NOR	ACI_RISK	RISK1	2010, 2022	0→1→2	NOU 2010:10 Adapting to a Changing Climate: Norway's Vulnerability and the Need to Adapt; Meld. St. 33 (2012–2013); Klima i Norge 2100 (2015); Norway's first Adaptation Communication (2021); updated national adaptation strategy (2022–2023)	Before 2010, Norway lacked a systematic national climate risk and vulnerability assessment framework (0). The 2010 commission report and 2013 white paper established an initial national assessment structure (1). From 2022 onward, the updated national strategy indicates a more systematic and cyclical risk assessment process (2).
NOR	ACI_RISK	RISK2	2013	1→2	NVE flood and avalanche early warning systems; varsom.no (joint NVE–MET Norway platform); national warning coordination system; DSB civil protection framework	During 2005–2012, Norway had strong warning systems through NVE and MET Norway, but these remained more sector-specific in structure (1). From 2013 onward, varsom.no and stronger national coordination indicate a mature multi-hazard early warning system (2).
NOR	ACI_RISK	RISK3	2013	0→1	NVE hydrological drought monitoring; MET Norway precipitation and temperature records; remote sensing and soil-moisture-based agricultural drought studies; OECD APME 2023 assessment noting that agriculture-oriented drought EWS remains under development	Before 2013, no institutionally established agriculture-oriented operational drought early warning system was in place (0). From 2013 onward, drought indicators and monitoring tools became available, but the system did not yet reach full maturity. This dimension therefore remains at level 1 throughout the period.
NOR	ACI_RISK	RISK4	2010	1→2	Landbruksmeteorologisk Tjeneste (LMT, NIBIO agricultural meteorology service); lmt.nibio.no portal (NIBIO and MET Norway cooperation); weather and phenological monitoring for agriculture	During 2005–2009, the LMT network and related agrometeorological services were already present but in a more limited and less digitalised form (1). From 2010 onward, the lmt.nibio.no platform and stronger institutional cooperation indicate a mature agrometeorological service structure (2).
NOR	ACI_FIN	FIN1_NV	2013	1→2	Regional Environmental Programmes (RMP); Special Environmental Measures in Agriculture (SMIL); Agricultural Environmental Plan (AEM); OECD APME 2025 noting climate and environmental programmes account	During 2005–2012, environmental and landscape schemes were already present at a medium level (1). The 2013 national adaptation strategy period coincided with stronger climate and environmental programming and a higher budget share, indicating a mature level (2).

					for around one-third of the Agricultural Agreement budget	
NOR	ACI_FIN	FIN2_RISK	—	2 (fixed)	Yield-income compensation scheme administered through Statens landbruksforvaltning; Norwegian Natural Perils Pool; Natural Damage Compensation Act (2014)	Norway's yield-income compensation system, combined with the Natural Perils Pool, forms a rule-based national agricultural risk-management architecture operating throughout the entire period. This dimension is coded at a high level throughout (2).
NOR	ACI_FIN	FIN3_INV	2015	1→2	Agricultural Development Fund (land improvement, landscape, energy saving); 2013 climate adaptation white paper on water and infrastructure investment; Climate Action Plan 2021–2030 (soil monitoring, manure and water management investments); Svalbard Global Seed Vault (2008)	During 2005–2014, infrastructure and land investments were already strong, but their explicit climate adaptation orientation remained more limited (1). From 2015 onward, the adaptation strategy period and later climate action planning made climate-oriented investments more systematic (2).
NOR	ACI_FIN	FIN4_PROG	2012, 2021	0→1→2	Meld. St. 33 (2013) implementation programmes; adaptation grants; programmes under the Climate Change Act; broader adaptation programme package from 2021 onward; Norway's Adaptation Communication (2021)	During 2005–2011, no dedicated adaptation programme framework was in place (0). Between 2012 and 2020, strategy-based programmes and grant activity created an initial programme structure (1). From 2021 onward, a broader national adaptation programme package indicates a mature programme architecture (2).
SWITZERLAND (CHL)						
CHL	ACI_GOV	GOV1_STRAT	2012, 2020	0→1→2	Swiss Strategy for Adaptation to Climate Change, Part 1 (2012); Action Plan 2014–2019 (Part 2); Action Plan 2020–2025 (Part 3, 75 measures)	No national adaptation strategy existed before 2012 (0). The 2012 strategy established a first-generation national framework (1). The 2020 action plan, based on updated climate scenarios, marks a more mature strategic framework (2).
CHL	ACI_GOV	GOV2_AG-RINT	2012, 2020	0→1→2	Action Plan 2014–2019 (agriculture: six measure clusters including water and natural hazards); Action Plan 2020–2025 (comprehensive integration of agriculture, water, and biodiversity)	Before 2012, adaptation integration into agriculture was fragmented (0). The 2012 strategy and 2014 action plan introduced dedicated agricultural action areas (1). The 2020 action plan marks a more comprehensive and mature form of agricultural integration (2).
CHL	ACI_GOV	GOV3_COORD	2012	1→2	CO ₂ Act (assigning coordination responsibilities to FOEN); Swiss Adaptation Strategy (2012); Action Plans 2014–2019 and 2020–2025	During 2005–2011, coordination existed through FOEN, but no formal national adaptation strategy was yet in place (1). From 2012 onward, the adaptation strategy and action plans established a more

CHL	ACI_GOV	GOV4_ME	2014, 2020	0→1→2	Action Plan 2014–2019 (development of an M&E system and indicators); Action Plan 2020–2025 (monitoring based on climate scenarios and risk analysis)	mature inter-agency coordination structure (2). Before 2014, no fully developed national monitoring and evaluation system for adaptation was in place (0). The 2014 action plan initiated the development of an M&E structure (1). The 2020 action plan established a more mature monitoring and implementation framework (2). During 2005–2011, Switzerland lacked a national adaptation strategy and a cyclical national risk assessment framework (0). Between 2012 and 2018, the strategy and action plan established an initial comprehensive risk assessment process (1). From 2019 onward, CH2018 climate scenarios and the updated adaptation framework indicate a more mature cyclical assessment structure (2).
CHL	ACI_RISK	RISK1	2012, 2019	0→1→2	Swiss National Adaptation Strategy (2012); Action Plan 2014–2019; Adaptation Communication (2021, documenting periodic assessment since 2012); NCCS Climate Scenarios CH2018	
CHL	ACI_RISK	RISK2	2015	1→2	MeteoSwiss national weather and flood warning system; Naturgefahren Schweiz multi-hazard platform (FOCP, WSL, SLF, MeteoSwiss); SLF avalanche bulletins; recognised by WMO/UNDRR as a good-practice MHEWS case	During 2005–2014, MeteoSwiss and SLF already provided strong hazard-specific warning systems, but a more integrated multi-hazard platform was still evolving (1). From 2015 onward, the Naturgefahren Schweiz platform indicates a mature multi-hazard early warning system (2).
CHL	ACI_RISK	RISK3	2012, 2025	0→1→2	Climatological drought monitoring (2010s, station-based); federal drought platform development project; national drought monitoring and early warning system operational from 8 May 2025	Before 2012, no systematic multi-indicator drought monitoring and early warning system was in place (0). During 2012–2024, drought monitoring relied on precipitation and temperature data, but no full early warning platform had yet been established (1). In 2025, the federal drought platform became operational, marking a mature national system (2). During 2005–2011, some agrometeorological services were already available, but institutionalisation remained limited (1). From 2012 onward, agrometeo.ch and Agroscope indicate a more established and comprehensive agrometeorological service architecture (2).
CHL	ACI_RISK	RISK4	2012	1→2	agrometeo.ch; MeteoSwiss agricultural climate products; Agroscope agrometeorological research and climate services for agriculture	
CHL	ACI_FIN	FIN1_ENV	—	2 (fixed)	Direct Payments Ordinance (soil quality, biodiversity, and water-quality conditionality); ecosystem service payments; PA14 and subsequent reforms	Switzerland's agricultural support system relies heavily on direct payments with strong environmental conditionality. This dimension is therefore coded at a high level throughout the entire period (2).

CHL	ACI_FIN	FIN2_RISK	—	1 (fixed)	Private crop insurance (Schweizer Hagel, multi-risk coverage); income stabilisation support in agriculture; very limited federal premium subsidies	Switzerland does not operate a broad subsidised multi-risk agricultural insurance system. It has structured but relatively limited risk instruments, which remain at a medium level throughout the period (1).
CHL	ACI_FIN	FIN3_INV	2014	1→2	Irrigation infrastructure modernisation; water-efficiency and drought-adaptation investment programmes; Action Plan 2014–2019 agricultural water-management measures; compensation for agricultural land used for flood prevention	Before 2014, agricultural infrastructure investments were present, but their climate adaptation focus remained limited (1). The 2014 action plan introduced more clearly adaptation-oriented investment measures, indicating a mature infrastructure investment framework (2).
CHL	ACI_FIN	FIN4_PROG	2010, 2014	0→1→2	Adaptation Strategy 2012; Action Plan 2014–2019 (63 federal measures, including agriculture); Action Plan 2020–2025 (75 measures)	Before 2010, no agriculture-specific adaptation programme framework was in place (0). During 2010–2013, strategy preparation and pilot activities provided an initial programme structure (1). The 2014 action plan established a comprehensive adaptation programme architecture (2).
TURKIYE (TUR)						
TUR	ACI_GOV	GOV1_STRAT	2010	0→1	National Climate Change Strategy (2010-2020); NCCAP 2011-2023; CCASAP 2011-2023	No national adaptation strategy was in place during 2005-2009 (0). A national strategic framework was established with the 2010 National Climate Change Strategy (1).
TUR	ACI_GOV	GOV2_AGRINT	2008, 2024	0→1→2	Strategy and Action Plan for Combating Agricultural Drought (2008-2012); 2024-2030 CCASAP (40 strategies and 129 actions for agriculture)	Before 2008, adaptation in agriculture was fragmented (0). The 2008 strategy introduced sectoral integration into agriculture (1). The 2024 CCASAP marks a mature level of agricultural integration (2).
TUR	ACI_GOV	GOV3_COORD	2013	1→2	Climate Change Coordination Board (2001); CBCCAM (2013)	Inter-ministerial coordination has existed since 2001 (1). With the establishment of CBCCAM in 2013, coordination evolved into a broader multi-stakeholder structure (2).
TUR	ACI_GOV	GOV4_ME	2011, 2024	0→1→2	NCCAP and CCASAP (sectoral targets and reporting framework); 2024-2030 CCASAP (11 sectors, formal monitoring arrangements)	No monitoring and evaluation framework existed before 2010 (0). NCCAP introduced partial monitoring from 2011 onward (1). The 2024 CCASAP established a more mature monitoring and evaluation framework (2).
TUR	ACI_RISK	RISK1	2011, 2018	0→1→2	CCASAP 2011-2023; 7th and 8th National Communications (UNFCCC); 2023-2030 Adaptation Strategy	No national climate risk assessment framework existed before 2010 (0). CCASAP introduced the first national framework in 2011 (1). From 2018 onward, periodic national reporting and assessment became more established (2).

TUR	ACI_RISK	RISK2	2009, 2022	0→1→2	AFAD Establishment Law No. 5902 (2009); MGM color-coded MeteoWarning system; IKAS (Integrated Warning and Alarm System)	Before 2008, warning systems were fragmented (0). AFAD introduced an integrated disaster management structure in 2009 (1). With the launch of IKAS in 2022, a full multi-hazard early warning system was established (2).
TUR	ACI_RISK	RISK3	2008, 2012	0→1→2	Strategy and Action Plan for Combating Agricultural Drought (2008-2012); TKYKK; National Drought Information and Early Warning System	No systematic national framework existed before 2008 (0). The 2008 strategy and TKYKK created an initial institutional basis (1). From 2012 onward, a national drought early warning system became operational (2).
TUR	ACI_RISK	RISK4	2008, 2020	0→1→2	MGM Agrometeorological Products (2008+); Ministry of Agriculture and Forestry Agricultural Meteorology Bulletins; MGM Department of Climate and Agricultural Meteorology (2020)	Before 2008, systematic agrometeorological services were limited (0). Agricultural frost maps and related bulletins introduced in 2008 marked an initial stage of institutionalisation (1). The establishment of a dedicated department in 2020 signaled a mature agrometeorological service structure (2).
TUR	ACI_FIN	FIN1_ENV	2008	0→1	CATAK Programme (Law No. 5403, 2006); National Agricultural Strategy 2006-2010; IPARD I (2007-2013)	Before 2008, environment- and climate-related agricultural support remained largely symbolic (0). From 2008 onward, CATAK and IPARD I made environmental support instruments more visible (1). The score remains at 1 through 2025.
TUR	ACI_FIN	FIN2_RISK	2005, 2008	1→2	Agricultural Insurance Law No. 5363 (2005); TARSIM Pool (2006+); Drought Yield Insurance expansion (2018)	TARSIM was established in 2005 and initially operated as a growing system (1). From 2008 onward, it developed into a mature structure through multi-risk coverage and high premium subsidies (2).
TUR	ACI_FIN	FIN3_ENV	2019	0→1→2	IPARD I-II-III; 10th Development Plan (water efficiency); World Bank Irrigation Modernisation Project (2019+); Water Efficiency Strategy Document	Before 2008, no clear climate-oriented investment framework existed (0). During 2008-2018, IPARD and development plans introduced a partial investment framework (1). From 2019 onward, World Bank-supported irrigation modernisation and the water efficiency strategy elevated this dimension to a mature level (2).
TUR	ACI_FIN	FIN4_PROG	2008, 2022	0→1→2	NCCS (2010-2020) and NCCAP (2011-2023); "Enhancing Adaptation Action in Turkey" EU-UNDP Project (2019+); 12th Development Plan (2024-2028); IPARD III	No adaptation programme framework existed before 2008 (0). Between 2008 and 2021, adaptation was supported through strategies and project-based interventions (1). From 2022 onward, multi-year and budgeted programme structures signaled a mature programme architecture (2).
UNITED STATES (USA)						
USA	ACI_GOV	GOV1_STRAT	2012, 2023	0→1→2	Federal Adaptation Plans (2012+); Executive Order 13653 (2013); Executive Order 14008 (2021); National	No national adaptation strategy or federal adaptation framework was in place before 2012 (0). Federal adaptation planning and Executive Order

					Climate Resilience Framework (2023)	13653 created an initial federal adaptation architecture during 2012–2016 (1). The 2023 National Climate Resilience Framework marks a more mature and integrated national framework (2). Before 2012, no systematic integration of adaptation into agricultural policy was in place (0). The 2012 USDA adaptation plans created an initial agricultural adaptation framework (1). The renewed federal adaptation agenda from 2021 onward, together with USDA planning and implementation structures, indicates a mature level of agricultural integration (2). During 2005–2012, scientific coordination existed through USGCRP, but no strong federal adaptation coordination mandate was in place (1). Executive Order 13653 strengthened federal coordination from 2013 onward (2). The revocation of this order in 2017 weakened coordination (1), followed by renewed strengthening under Executive Order 14008 in 2021 (2). A subsequent federal rollback by 2025 lowered this dimension again (1). Before 2014, no systematic national adaptation monitoring and evaluation structure existed (0). NCA3 introduced a cyclical national assessment process (1). By 2023, NCA5 and subsequent federal guidance created a more mature monitoring and indicator-based assessment architecture (2). During 2005–2008, an updated cyclical national climate risk assessment system had not yet been institutionalised (0). NCA2, NCA3, and related federal adaptation planning created an initial comprehensive assessment framework during 2009–2015 (1). From 2016 onward, repeated NCA cycles and related federal risk assessment processes indicate a mature national climate risk assessment structure (2).
USA	ACI_GOV	GOV2_AG-RINT	2012, 2021	0→1→2	USDA Climate Change Adaptation Plan (2012, updated 2014); USDA Climate Hubs (2014+); Executive Order 14008 (2021); National Climate Resilience Framework (2023)	
USA	ACI_GOV	GOV3_COORD	2013, 2021	1→2→1	USGCRP coordination mechanisms; Executive Order 13653 (2013); Executive Order 13783 (2017, revoking EO 13653); Executive Order 14008 (2021); 2025 federal rollback in climate coordination	
USA	ACI_GOV	GOV4_ME	2014, 2023	0→1→2	National Climate Assessment (NCA3, 2014; NCA4, 2018; NCA5, 2023); CEQ Adaptation Indicators guidance (2024); Federal Adaptation Plans 2024–2027	
USA	ACI_RISK	RISK1	2009, 2016	0→1→2	NCA2 (2009); Executive Order 13653 (2013); NCA3 (2014); NCA4 (2018); NCA5 (2023); Global Change Research Act framework	
USA	ACI_RISK	RISK2	2012	1→2	NOAA National Weather Service warning system; I-PAWS – Integrated Public Alert and Warning System; Wireless Emergency Alerts	During 2005–2011, the United States already had a strong national meteorological warning system, but a fully integrated public warning architecture

					(mandatory nationwide carrier participation from 2012)	was still developing (1). From 2012 onward, IPAWS and Wireless Emergency Alerts indicate a mature multi-hazard early warning system (2). During 2005–2007, the United States already had strong drought monitoring capacity, but NIDIS was still in an earlier operational phase (1). From 2008 onward, the combination of NIDIS and the U.S. Drought Monitor constituted a mature, nationally institutionalised agriculture-relevant drought monitoring and early warning system (2).
USA	ACI_RISK	RISK3	2008	1→2	U.S. Drought Monitor (weekly national drought map); National Integrated Drought Information System (NIDIS, 2006 onward)	
USA	ACI_RISK	RISK4	2014	1→2	USDA/NOAA agriculture-focused climate and drought guidance; USDA Climate Hubs (2014); Adaptation Resources for Agriculture guidance; NRCS agrometeorological resources	During 2005–2013, NOAA and USDA already provided agriculture-relevant climate information, but a more systematic service architecture was still limited (1). From 2014 onward, USDA Climate Hubs and related federal resources indicate a mature agrometeorological and agricultural climate service system (2).
USA	ACI_FIN	FIN1_ENV	2023	1→2	CRP, EQIP, CSP, ACEP, and RCPP conservation programmes; Inflation Reduction Act (2022) additional climate-smart funding; Partnerships for Climate-Smart Commodities	During 2005–2022, the United States maintained strong conservation-oriented agricultural programmes, but without the same scale of explicitly climate-labelled additional resources observed after 2022 (1). From 2023 onward, IRA funding and climate-smart commodity programmes mark a clear strengthening of climate-oriented support visibility (2).
USA	ACI_FIN	FIN2_RISK	—	2 (fixed)	Federal Crop Insurance Program; Whole-Farm Revenue Protection; Livestock Forage Disaster Program; LFP, LIP, and ELAP disaster assistance programmes	The U.S. operates one of the most extensive state-supported agricultural insurance and disaster support systems in the world, with broad product coverage and substantial federal premium support. This dimension is coded at a high level throughout the entire period (2).
USA	ACI_FIN	FIN3_INV	2021	1→2	Bureau of Reclamation water infrastructure investments; Infrastructure Investment and Jobs Act (2021); Inflation Reduction Act (2022) drought and resilience funding	During 2005–2020, the United States already invested in agricultural and water-related infrastructure, but large-scale climate adaptation-oriented packages were not yet in place (1). From 2021 onward, IJIA and IRA funding created a more mature climate-

						resilient investment framework, particularly in water and drought resilience (2).
						Before 2011, no agriculture-specific adaptation programme architecture was in place (0). Between 2011 and 2020, USDA adaptation planning and Climate Hubs created an initial programme framework (1). From 2021 onward, a broader package of climate-smart and adaptation-related programmes indicates a mature programme architecture (2).
USA	ACI_FIN	FIN4_P ROG	2011, 2021	0→1→2	USDA Climate Change Adaptation Plan (2012); USDA Climate Hubs (2014); Executive Order 14008 adaptation programmes (2021); Partnerships for Climate-Smart Commodities (2022)	

Note: Break years represent the approximate dates at which the relevant policy instruments entered into force. Score assignments are based on an expert-informed composite index approach, and the coding thresholds are defined in the methodology section (Section 3.3).