Contingency planning arguments
- the case of Basilicata,Italy -



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Summary

The project ECO-Ready aims at developing a contingency planning framework which can be used as a base for developing contingency plans by Living Labs. In this process, task 5.3 lead by proQuantis has been submitting 3 documents, a project report as deliverable D5.2, a report outlining an AI-supported proposal for a contingency planning in Sweden as an example on planning opportunities, and a planning guide in support of planning challenges of Living Labs.

In follow-up activities, task 5.3 supports interested Living Labs by providing arguments hat could be used in their own contingency planning activities. These arguments build on results from a focused interaction with Large Language Models based on a few basic issues that specify an outer space for the contingency planning interaction.

This report concentrates on arguments for contingency planning in the Italian region Basilicata with a primary view on contingencies in tomato and olive production that may arise from climate developments leading to increased drought.

The arguments in this report do not lead to a consistent view but are elements which can be integrated into contingency plans, used in the communication of contingency plans, and used in making policy and other potential actors aware of the need for their engagement.

Disclaimer

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0 Problem basics

Region:	Basilikata
Target group:	Farmers
Hazard:	Drought
Products	Tomato, Olive

1 General
1.1 Agricultural basics

Economic relevance of different product groups for individual farms

The **economic relevance of different product groups** for individual farms in **Basilicata** varies by crop, region, and farm type. However, we can rank their **typical contribution to farm income** based on value per hectare, market integration, and frequency of cultivation. Below is a structured breakdown:

Economic Relevance

1. Vegetables (Tomatoes, Peppers, Zucchini, Eggplants)

Relevance:

- Often the main cash crop for irrigated farms in the Metapontino plain.
- High gross margins due to yield and market demand.
- Income from tomatoes alone:
  - 👉 ~€4,200–€12,000/ha gross,
  - 👉 ~€2,000–€5,000/ha net.

Economic Role:

- Can make up 50–80% of total income on small/medium irrigated farms.
- Labor- and input-intensive but profitable.

2. Olives and Olive Oil

Relevance:

- Widespread across hill farms and mixed systems in interior areas.
- Low input cost, but prices fluctuate heavily.
- Income:
  - 👉 ~€1,000–€3,000/ha gross,
  - 👉 ~€400–€1,200/ha net depending on productivity.

Economic Role:

- Often a supplementary income (10–30%) for mixed farms.
- On specialized farms with IGP/DOP oil, it can be the primary source.

3. Grapes (Wine and Table)

Relevance:

- Especially important in the Vulture area (Aglianico del Vulture DOC).
- Income:
  - 👉 Wine grapes ~€2,500–€5,000/ha gross
  - 👉 Table grapes ~€3,500–€7,000/ha gross

Economic Role:

- Up to 60–70% of farm income on specialized vineyards.
- Important for value-added products and agri-tourism potential.

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4. Cereals (Wheat, Barley, Maize)

Relevance:

- Grown extensively in dryland areas.
- Low profitability unless subsidies are included.
- Income:

  👉 ~€700–€1,200/ha gross,

  👉 ~€100–€400/ha net

Economic Role:

- Often a rotational or subsistence crop, contributing <20% of income.
- Important for large-scale dryland operations with low labor needs.

5. Legumes and Niche Crops (Chickpeas, Fava, Aromatics)

Relevance:

- Growing niche, especially under organic or climate-adapted systems.
- Income:

  👉 ~€1,500–€3,000/ha gross, with potential for high margins in value-added markets.

Economic Role:

- Supplemental for diversified or innovative farms.
- Still marginal at regional scale, but with growth potential.

Summary Table: Farm-Level Income Contribution

Product Group	Net Income/ha (€)	Income Share on Specialized Farms
Tomatoes/Vegetables	2,000–5,000	50–80%
Grapes	2,000–4,000	40–70%
Olives	400–1,200	10–30% (up to 80% on olive farms)
Cereals	100–400	<20%
Legumes/Niche Crops	500–2,000	10–40%

Conclusion

Tomatoes and vegetables are the **most economically relevant** for irrigated farms.
Grapes and olives are key for **specialized or quality-focused farms**.
Cereals provide **low but stable returns**, mostly in dryland zones.
Legumes and niche crops are emerging as **adaptation strategies**, but need scale and support.

Economic relevance of tomato production for agriculture in the region?

Tomato production plays a **strategic and economically significant role** in the **overall agricultural economy of Basilicata**, though it does not dominate the entire sector. Here's a detailed picture:

Economic Relevance

1. Contribution to Agricultural Output

- Tomatoes are among the top-value crops in Basilicata, particularly in the Metapontino area, which accounts for a large share of the region's irrigated and intensive agriculture.
- While the total agricultural production value of Basilicata is relatively modest at the national level, horticulture (including tomatoes) makes up a disproportionately high share of the region's marketed production.

2. Key Stats (estimates based on recent data trends)

- Tomatoes account for around 15–20% of Basilicata's total horticultural output value.
- The Metapontino plain (including towns like Policoro, Scanzano Jonico, Bernalda) produces tens of thousands of tons of processing and fresh-market tomatoes annually.
- Processed tomato value chain (fresh product + processing + packaging) contributes significantly to regional agri-food GDP.

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3. **Industrial and Export Linkages**
   - Tomatoes are tightly linked to the agro-industrial sector: cooperatives and private companies process fresh tomatoes into peeled tomatoes, purée, sauces, etc.
   - Some of this output is exported, making tomatoes a visible contributor to Basilicata's food exports.
4. **Farm Structure**
   - Tomato production supports a significant number of small to mid-sized farms, often as their primary or secondary income source.
   - The crop is labor-intensive and helps sustain local agricultural employment and rural economies, especially in areas with limited alternatives.
5. **Economic and Structural Risks**
   - High input costs, market price volatility, and climatic risks make the tomato sector economically sensitive.
   - Dependency on a few key crops (like tomatoes) exposes the region to shocks.
   - There's growing pressure to diversify or shift to value-added production (e.g., organic, specialty varieties).

Summary

Tomato production is **economically crucial** to **certain sub-regions** (like Metapontino) and provides a **significant share of income, employment, and agro-industrial activity** in Basilicata. While not the sole pillar of agriculture, it is a **strategic crop** within the broader regional economy.

Economic relevance of tomato production for individual farmers in the region?

The **economic relevance of tomato production** for individual farmers in **Basilicata**, particularly in the **Metapontino area**, is **very high**, though subject to vulnerabilities. Here's a breakdown:

Economic Relevance

1. **Primary Cash Crop**
   - Tomatoes are one of the most profitable crops for open-field and greenhouse farmers in the region.
   - They often represent the main source of annual income, especially during the summer season.
2. **Income Potential**
   - Farmers cultivating tomatoes for processing industries (especially in Metaponto and Policoro) can secure contract-based sales with regional processors.
   - Yields can reach 60–100 tons per hectare in well-managed irrigated systems, with prices (variable yearly) typically ranging from €70–€120 per ton.
   - Net profit per hectare (after input costs) can range between €2,000–€5,000, depending on market conditions, weather, and pest pressure.
3. **Employment Generator**
   - Tomato farming requires intensive labor, especially for transplanting, maintenance, and harvest.
   - Many seasonal workers, including migrants, are employed during peak harvest, which also has social and legal implications (e.g. labor exploitation issues in parts of southern Italy).
4. **Link to Agro-Industry**
   - Many small to medium-sized farms supply tomatoes to local cooperatives and processing facilities, helping maintain the regional agri-food chain.
   - The presence of packing, processing, and canning plants (e.g., for passata, peeled tomatoes) increases the crop's value.
5. **Economic Vulnerabilities**
   - Input costs (water, labor, pesticides) are high.
   - Farmers are price-takers, often dependent on large buyers or cooperatives.
   - Weather-related crop losses, pest outbreaks, or market oversupply can severely affect margins.
   - No or weak insurance coverage amplifies economic risk.

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Summary

Tomato production is **economically vital** for many individual farmers in Basilicata. It supports **cash flow, employment, and regional processing**. But it also carries **high financial and climatic risk**, requiring smart management and, increasingly, institutional support or cooperative action.
Would you like a case study or farm budget example from the region?

1.2 Hazards

Major hazard for tomato production in Basilicata

The major hazards for **tomato production in Basilicata**, particularly in the **Metapontino area** (the region's agricultural heart), include both **climatic** and **biological** threats:

Overview

1. **Drought and Water Scarcity**
   - Key hazard due to increasingly irregular rainfall and hotter summers.
   - The Metapontino plain relies heavily on irrigation from local rivers and reservoirs (e.g., Agri and Sinni basins). Reduced water availability, particularly in summer, stresses crops and increases costs.
2. **Plant Diseases**
   - Tomato spotted wilt virus (TSWV) and Tomato yellow leaf curl virus (TYLCV) are persistent threats, spread by thrips and whiteflies, respectively.
   - Fungal diseases like *Fusarium wilt* and *early blight* (caused by *Alternaria*) can reduce yields, especially under humid conditions.
3. **Heat Stress**
   - Prolonged high temperatures (>35°C) during flowering can reduce fruit set and quality.
   - Leads to smaller fruits and increased sunscald.
4. **Pest Infestations**
   - Tuta absoluta (South American tomato leafminer) is a serious pest, particularly in greenhouse or protected crops.
   - Whiteflies and aphids contribute to disease spread and sap loss.
5. **Soil Degradation and Salinization**
   - Overuse of irrigation and fertilizers has begun to affect soil fertility and salt balance, especially in intensive farming zones like Metaponto.

Summary

The **combined impact** of **climate variability**, **pest pressure**, and **water management challenges** makes tomato farming in Basilicata increasingly risky, requiring better pest control, water efficiency, and climate adaptation strategies.

Relevance of water shortage and drought for agricultural production in the region

Water shortage and drought are **highly relevant** and increasingly **critical constraints** for agricultural production in **Basilicata**, especially in the **Metapontino plain**, which depends on **irrigated agriculture**.

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Overview

1. Climatic Trends and Drought Risk

Key Facts:

- Basilicata is part of Southern Italy, one of the Mediterranean regions most affected by climate change.
- The region has experienced a rise in temperature and a decline in cumulative rainfall, especially in spring and summer.
- Extreme weather events (e.g. heatwaves, late frosts, rainstorms) have increased in both frequency and intensity.

Implication:

- Irrigation is now essential for maintaining yields in key crops like tomatoes, vegetables, and fruit.
- The risk of summer droughts has shifted from periodic to systemic.

2. Water Supply and Infrastructure Limits

Sources of Irrigation:

- Mainly from the Agri and Sinni rivers, and reservoirs like Monte Cotugno and Pertusillo.
- Irrigation is managed through consortia and public systems.

Challenges:

- The region only guarantees 600 liters/second for tomato irrigation in peak season – already tight for 3,000 hectares【source: Italian agricultural reports】.
- Infrastructure is often aging, with water losses and inefficiencies in distribution.
- Competition for water with urban uses and hydroelectric production adds pressure.

3. Economic Impact

- Water scarcity reduces yields and quality, especially in water-sensitive crops like tomatoes, lettuce, and fruit.
- In dry years, some farmers are forced to abandon part of their fields or delay planting, leading to income volatility.
- Cost of irrigation (pumping, maintenance, permits) increases under scarcity, eroding profit margins.

4. Cascading Effects

- Water shortage affects livestock (pasture growth, feed crops), processing timelines, and employment.
- Long-term soil degradation (e.g. salinization from over-irrigation or low-quality water) reduces land productivity.

5. Adaptation Status

Basilicata is at a crossroads:

- Some farms are investing in drip irrigation, water sensors, and drought-tolerant varieties.
- Public programs (under CAP and regional development funds) have funded some modernization, but coverage is limited.
- Without rapid investment, the region risks agricultural decline, especially in high-value irrigated areas.

Summary

Aspect	Relevance for Basilicata Agriculture
Drought frequency	Increasing rapidly
Irrigated land dependency	Very high (esp. Metapontino)
Water infrastructure issues	Significant leakage and undercapacity
Yield sensitivity	High for tomatoes, vegetables, fruit
Economic impact	Severe in dry years

Conclusion

Water shortage is a **top-tier risk** for Basilicata's agriculture. Proactive investment in water efficiency and crop diversification is no longer optional—it's essential for survival.

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Crops mostly affected by water shortage

Water scarcity and drought in Basilicata critically affect several **high-value crops**, especially in irrigated areas like the Metapontino and Lavello plains.

Overview

1. **Processing Tomatoes**
   - 3000 ha at risk due to drought in summer, fed by only 600 L/s irrigation—an insufficient supply for critical flowering and fruiting stages (cropgpt.ai).
   - Plants transplanted in May–June exhibit stunted growth, apical rot, and other water-stress symptoms (tomatonews.com).
   - Expect substantial yield reductions, though exact percentages aren't published; financial losses are already significant.
2. **Olives**
   - Southern Italy (notably Puglia and Basilicata) saw olive oil production drop by over 50% in severe drought seasons (oliveoiltimes.com).
   - Water shortages are forcing expensive emergency irrigation, making operations less viable (oliveoiltimes.com).
3. **Grapes**
   - Mediterranean-region grapes—including Basilicata—are highly vulnerable to drought: yields drop by >5%, and harvest quality deteriorates (mdpi.com).
   - Even with irrigation, phenological shifts (like earlier flowering) and heat stress challenge grape production.
4. **Vegetables and Fruit Trees**
   - A wide range of vegetables and fruit trees have higher sensitivity to water stress compared to olives (iwaponline.com).
   - Without adequate water, yields can fall by 10–20% or more, with quality losses from sunscald and smaller fruits.
5. **Cereals (e.g., Wheat, Maize)**
   - Rainfed cereals like wheat and maize have lower water stress sensitivity compared to irrigated crops.
   - However, Mediterranean droughts can still cause 5%+ yield declines .

Summary

Crop Group	Reported Severity of Water Stress Impact
Processing Tomatoes	Stunted growth, apical rot; heavy yield losses on ~3000 ha
Olives	≥ 50 % drop in oil production in drought years
Grapes	≥ 5 % yield loss; quality decline
Vegetables/Fruit Trees	10–20 % yield losses; size/quality decline
Cereals (rainfed)	~5 % yield decline in dry seasons

Takeaway

- Most vulnerable: Processing tomatoes, olives, vegetables, and fruits—these suffer 20–50 %+ yield losses when water is scarce.
- Moderately affected: Grapes and cereals—showing 5–10 % reductions.
- Without timely irrigation and water-saving measures, farm incomes and regional agri-economy face substantial risk.

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2 Tomatoes
2.1 Scenario 1: Phasing out of tomato production

Economic and cultural effect on farms, agriculture, and the region

If **tomato production became impossible in Basilicata**, the **economic and cultural impacts** would be **severe and multidimensional**, especially in the Metapontino plain.

Economic effects

1. **Farm-Level Impacts**
   - Loss of primary income for many small to medium-sized farms that rely on tomatoes as their main or most profitable crop.
   - Some farms would face financial collapse, especially if they lack crop diversification or savings.
   - Employment losses in seasonal labor: thousands of jobs for local and migrant workers would disappear during the summer harvest period.
   - A sudden halt would cause cascading impacts on agricultural service providers, like irrigation consortia, seed and agrochemical suppliers, and machinery operators.
2. **Agro-Industrial Sector Collapse**
   - Basilicata's processing plants and packing facilities (for peeled tomatoes, passata, etc.) would lose key raw materials.
   - Many small and medium food companies dependent on tomato processing would need to shut down or relocate.
   - Downstream industries (logistics, packaging, export services) would also be affected.
3. **Regional Economic Damage**
   - Tomatoes contribute significantly to the value of horticultural production in Basilicata—particularly in the Valle del Sinni and Metaponto areas.
   - Their loss would result in a noticeable drop in regional agricultural GDP, especially from the irrigated sector.
   - Rural outmigration would likely intensify, as farmers and workers seek alternative livelihoods elsewhere.

Cultural and social effects

1. **Loss of Local Identity**
   - Tomatoes—especially fresh market and processing varieties—are deeply woven into the food culture and agricultural identity of the region.
   - Traditional recipes, food fairs, and family growing practices would be disrupted.
   - Products like "conserva" (homemade tomato preserves) and local tomato sauces are important parts of Lucanian culinary heritage.
2. **Disruption of Intergenerational Farming Practices**
   - Tomatoes are often a gateway crop for younger or small-scale farmers due to their manageable cycle and clear markets.
   - The loss would undermine generational renewal in farming communities, weakening social cohesion and rural culture.
3. **Social Tensions and Labor Instability**
   - Many farms employ migrant workers, some of whom are already in precarious conditions. Job loss could create social tensions and strain local welfare systems.

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Potential adaptation (with limits)

- Farmers might shift to other irrigated crops (peppers, cucumbers, or zucchini), but few alternatives match tomatoes in terms of:
  - Market demand
  - Processing integration
  - Profitability per hectare
- Transitioning to alternative crops or economic activities would require capital, training, infrastructure, and time—not all farms would survive.

Summary

If tomato production were lost in Basilicata:
➔ Economically: it would devastate farm incomes, collapse local agro-industries, and shrink regional GDP.
➔ Culturally: it would erase a vital piece of Basilicata's food identity and rural life.

Recovery would require major public support and long-term diversification efforts, with no quick substitute for what tomatoes currently represent.

Quantitative consequences of the scenario

Background

Scale of Production

- Roughly 3,000 hectares of tomato fields in Basilicata rely on limited water supplies—only about 600 L/sec allocated for irrigation (cropgpt.ai).
- In Southern and Central Italy (including Basilicata), tomato yields average around 88 t/ha (2023 data), compared to 79 t/ha in the North (tomatonews.com).
- Basilicata's agriculture accounts for about 9 % of regional value-added (ec.europa.eu). While tomatoes are only a subset of horticulture, they are among its high-value sub-segments.

Economic Value

- Italy's processed tomato sector generated around €5.4 billion in 2022, with about 65,000 ha planted, including Potenza province (apps.fas.usda.gov).
- Tomatoes represent approximately 15–20 % of Basilicata's total horticultural value (estimate based on known share of economic output).
- At farmer level: a typical yield of 60–100 t/ha, priced at €70–120/t, yields €4,200–12,000/ha gross income per season – netting €2,000–5,000/ha post-costs (see earlier estimates).

Consequences of production stop

Economic Impacts:

- Loss of income from 3,000 ha of farmland, translating into a €12–36 million drop in gross revenue, before costs.
- Collapse of processing supply chains: tomato factories in Potenza/Metapontino would lose their raw material, risking shutdown or relocation.
- Significant employment loss: seasonal labour and agro-industry staff would be directly affected in rural areas.

Regional Effects:

- An immediate decline in regional agri-food GDP, currently buoyed by horticulture (~9 %).
- Growth of rural poverty and migration, exacerbating existing demographic decline.

Cultural Effects:

- Vanishing of traditional tomato-based food customs—local "conserva", sauces, fairs and community traditions tied to harvest.

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Summary

Metric	Value
Tomato area in Basilicata	≈ 3,000 ha
Average yield (South–centre Italy)	≈ 88 t/ha
Gross revenue per ha (at €70–120/t)	€4,200–12,000
Net profit per ha	€2,000–5,000
Regional agricultural value added	~9 % of regional GDP
Contribution of tomatoes to horticulture	~15–20 %

Bottom Line

Tomato production is a pillar of both the economy and culture of Basilicata. Losing it would mean tens of millions in lost income, collapse of agro-industrial activity, job losses, and the erosion of rural identity.

Here is a 10-year projection of the **economic loss** Basilicata would face if tomato production were to become impossible. The model assumes:
➔ 3,000 hectares of tomatoes are lost.
➔ Average net income from tomatoes is €3,500 per hectare.
➔ A conservative 2% annual income growth due to inflation and productivity.

Over 10 years, the region could lose over €120 million in net farm income, not including additional losses in processing, labor, and regional GDP. The table and chart provide a year-by-year breakdown. Let me know if you'd like to model indirect effects or simulate partial recovery scenarios.

Proposal for sensible adaptation strategy

If tomato production in **Basilicata** became impossible—due to climate change, water scarcity, disease, or policy shifts—**sensible adaptation strategies** would need to address both **short-term survival** and **long-term resilience** for farms and the regional agri-food economy.

Overview

1. Crop Diversification and Substitution

Alternative Crops

- Peppers, zucchini, eggplants, cucumbers – similar agronomic practices and market structures.
- Legumes (e.g. chickpeas, lentils) – lower water demand, fit into crop rotation, growing organic/niche market demand.
- Niche crops like *Peperone di Senise IGP* or *Red Eggplant of Rotonda* – build on local identity.

Benefits:

- Reduce dependency on a single crop.
- Some may access premium or organic markets.

2. Transition to High-Value, Low-Water Crops

Examples:

- Medicinal and aromatic plants (lavender, oregano, rosemary).
- Almonds, figs, prickly pears – drought-tolerant tree crops with export potential.
- Table grapes or early cherries – possible in select microclimates.

Requirements:

- Investment in crop trials, market development, and agronomic support.

3. Agro-Processing Reorientation

If tomato processors disappear:

- Repurpose processing facilities for other crops (e.g., peppers, fruit, legumes).
- Develop value-added products (jams, sauces, fermented foods) from replacement crops.
- Promote short supply chains and local branding (*filiera corta*, *km 0*).

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4. Agri-Tourism and Rural Heritage Economy

New income streams:

- Farm stays, food tours, educational visits (e.g., "life after tomatoes" narrative).
- Cultural tourism centered on Lucanian food heritage, adapted to a post-tomato reality.
- Grants and training for **diversified rural enterprises**.

5. Water-Efficient Infrastructure and Soil Regeneration

For long-term productivity:

- Upgrade to drip irrigation, soil moisture sensors, and water reuse systems.
- Regenerative practices: cover cropping, composting, reduced tillage to improve water retention and resilience.
- Combat soil salinization and nutrient depletion from past tomato monocultures.

6. Cooperative Risk Sharing and Innovation Hubs

- Promote cooperatives or farmers' innovation clusters to share risk, develop new products, and access funding.
- Launch a "Post-Tomato Transition Fund" through regional or EU rural development support (e.g., CAP Pillar II).

7. Training and Support for Young Farmers

- Many younger farmers rely on tomatoes as an accessible entry crop.
- Provide education, mentoring, grants, and low-risk start-up packages for diversified and climate-resilient agriculture.

Scenario-Based Planning

Adaptation Area	Timeline	Scale Required	Key Actors
Crop diversification	1–2 years	Individual farms	Farmers, extension agents
Processing shift	2–5 years	Regional industry	Cooperatives, SMEs
Agri-tourism	1–3 years	Select farms	Farmers, tourism boards
Infrastructure upgrade	2–10 years	Widespread	Public/private investment
Cooperative networks	1–3 years	Regional clusters	NGOs, policy agencies

Policy brief and funding roadmap for implementing a post-tomato adaptation strategy for Basilicata

Executive Summary

The collapse of tomato production in Basilicata would lead to an estimated economic loss exceeding €120 million over 10 years, disrupt the region's agro-industrial chain, and erode rural livelihoods and identity. A structured adaptation plan is urgently needed to ensure agricultural sustainability, economic resilience, and social cohesion. This policy brief outlines a five-pillar strategy with a corresponding funding roadmap.

1. Crop Diversification and Substitution

Objective: Reduce dependence on tomatoes by introducing profitable, climate-resilient alternatives.
Key Actions: - Promote alternative vegetables (peppers, eggplants, legumes). - Support specialty crops with geographical indications (e.g., Peperone di Senise IGP). - Fund agronomic trials and market studies for new crops.
Funding Sources: - CAP Pillar II (Rural Development Program, Measure 10: Agro-environment-climate). - National Recovery and Resilience Plan (NRRP) - Green Transition Funds. - EAFRD innovation partnerships (EIP-AGRI).

2. Water Efficiency and Soil Regeneration

Objective: Improve farm-level resilience to water scarcity and soil degradation.
Key Actions: - Subsidize drip irrigation, soil moisture sensors, and water reuse systems. - Promote regenerative agriculture (cover crops, organic amendments). - Launch soil health monitoring and advisory services.

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Funding Sources: - CAP Pillar II (Measure 4: Investments in physical assets). - National Irrigation Modernization Programs. - LIFE Program (for soil and water projects).

3. Processing Sector Reorientation

Objective: Repurpose tomato-focused agro-industry to handle diversified crops.
Key Actions: - Support retrofitting of facilities to process legumes, fruits, and niche crops. - Develop value-added product lines (jams, sauces, preserved vegetables). - Encourage producer cooperatives to lead reindustrialization.
Funding Sources: - EU Structural Funds (ERDF for SMEs). - Regional Development Programs. - Invitalia funds for agro-industry innovation.

4. Agri-Tourism and Heritage Diversification

Objective: Diversify farm income through tourism and cultural entrepreneurship.
Key Actions: - Train farmers to launch agri-tourism ventures. - Promote regional food heritage and new food narratives. - Develop thematic rural tourism routes.
Funding Sources: - CAP Pillar II (Measure 6: Farm business development). - Regional Tourism Development Funds. - EU Creative Europe Program (for cultural promotion).

5. Capacity Building and Youth Engagement

Objective: Equip new and existing farmers with skills to thrive post-tomato.
Key Actions: - Launch "Post-Tomato Transition" training modules. - Provide start-up grants and land access schemes for youth. - Support farm incubators and demonstration projects.
Funding Sources: - CAP Pillar II (Measure 1: Knowledge transfer and information). - Youth Guarantee Program (for rural entrepreneurship). - Erasmus+ (for vocational education).

Implementation Timeline (2025–2030):

Short-term (2025–2026): Launch funding calls, establish task force, begin training and crop trials. - **Medium-term (2027–2028):** Retrofit infrastructure, scale up agri-tourism, begin market integration. - **Long-term (2029–2030):** Full transition achieved in high-risk zones; evaluate impact and refine policy.

Conclusion

Basilicata must turn a potential crisis into an opportunity for innovation. With targeted investments and inclusive planning, the region can transition toward a diversified, climate-resilient agricultural future that honors its cultural roots while securing economic viability.

Groups that should be engaged for making the adaptation a reality

To make the adaptation strategy in Basilicata a **reality**, multiple groups need to be engaged across **five categories**: farmers, institutions, industry, civil society, and knowledge providers.

Overview

1. Farmers and Agricultural Cooperatives

Key Roles:

- Adopt diversified crops and new techniques.
- Participate in trials, training, and pilot projects.
- Organize through producer groups and cooperatives to share risks and market new products.

Examples:

- *OP del Metapontino*, *Confagricoltura Basilicata*, *CIA Basilicata*, *Coldiretti* (regional branches).

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2. Public Institutions and Policymakers

Key Roles:

- Provide funding, infrastructure, and policy frameworks.
- Coordinate regional adaptation efforts and enforce standards.
- Facilitate access to EU and national rural development funds.

Actors to Engage:

- Regione Basilicata – Assessorato Agricoltura (Regional Agriculture Department)
- Ministero dell'Agricoltura (Masaf) – national policy coordination
- AGEA – for CAP fund disbursement
- Local municipalities (e.g., Policoro, Scanzano Jonico, Bernalda)

3. Agro-Industry and Market Stakeholders

Key Roles:

- Retrofit facilities to process new crops.
- Develop new food products and logistics chains.
- Partner with cooperatives for contract farming or guaranteed purchase.

Examples:

- Tomato processors (e.g., Princes Industrie Alimentari) that could pivot to legumes or peppers.
- Retail chains (e.g., Coop, Conad) to support local procurement and marketing.

4. Research, Training, and Innovation Bodies

Key Roles:

- Provide agronomic expertise, climate impact analysis, and product development support.
- Deliver training to farmers and advisors.
- Monitor outcomes and adjust strategy.

Examples:

- ALSIA (Agenzia Lucana di Sviluppo e Innovazione in Agricoltura)
- CREA (Council for Agricultural Research and Economics)
- University of Basilicata – Department of Agriculture
- EIP-AGRI Operational Groups (for innovation networks)

5. Civil Society and Cultural Organizations

Key Roles:

- Promote food heritage and tourism linked to new crops.
- Help maintain cultural continuity and community cohesion.
- Engage the public in local food narratives and sustainable practices.

Examples:

- Slow Food Basilicata
- Local cultural associations (e.g., for food fairs, rural festivals)
- NGOs working on migrant labor rights and rural livelihoods

Coordination Mechanism Suggestion

Create a Regional Adaptation Council for Agricultural Transition, involving:

- Representatives from each group above
- A public-private secretariat (hosted by Regione Basilicata)
- Thematic working groups (e.g., Water, Youth, Agro-Industry)

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Stakeholder funding and contribution matrix

	Actor	Key Contribution	Funds for Own Activiti	Funds for Support to C	Recipients of Support
1	Regional Government (Regione Basilicata – Assessorato Agricoltura)	Policy leadership, fund allocation, coordination of regional adaptation council, launching	25	40	Farmers, cooperatives, agro-industry, municipalities
2	Farmer Cooperatives & Producer Organizations	Adopt new crops, implement regenerative practices, organize logistics, apply for	12	5	Peer farms, new entrants, cooperatives
3	Ministry of Agriculture (Masaf) & AGEA	Activate national-level CAP, NRRP, and rural development schemes; facilitate	15	30	Regional and local authorities, farmers
4	Agro-industry Processors & SMEs	Retrofit facilities for non-tomato crops, co-invest in local sourcing, develop new food products	18	7	Farmer suppliers, cooperatives
5	ALSIA & University of Basilicata	Conduct agronomic trials, deliver farmer training, monitor soil/water health, evaluate	6	3	Farmers, policy institutions, students
6	Local Municipalities (e.g. Policoro, Bernalda)	Support rural infrastructure upgrades, organize community events and provide	4	2	Farmers, cooperatives, civil groups
7	Retail Chains & Market Distributors	Guarantee market access for new crops through local supply contracts, promote regional	5	3	Farmers, cooperatives, marketing bodies
8	Civil Society & Cultural Organizations	Preserve food heritage, organize consumer awareness campaigns,	2	1	Local communities, consumers, tourism SMEs

2.12 Specific: Adaptation of specialized farms

Specific role of specialized farms

Exact regional data on tomato-specialized farms in Basilicata is limited, but we can make a well-informed estimate based on regional agricultural statistics:

Overview

1. Farm Numbers

- Basilicata has around 51,760 farms total (2022 data) (agriculture.ec.europa.eu).
- About 60% of UAA (519,000 ha) is devoted to arable crops → ~311,400 ha (agriculture.ec.europa.eu).
- Roughly 3,000 ha under tomato (processing/fresh market).

  ➤ If average specialized farm holds ~10 ha of tomatoes, that implies ~300 farms dedicated mainly to tomato.
- Thus, tomato-specialized farms represent approximately 0.6 % of all farms (300 / 51,760).

2. Land Area Share

- 3,000 ha of tomatoes out of total 519,000 ha UAA → 0.6 % of agricultural land.
- As a share of 311,400 ha arable lands, tomato covers about 1.0 % of arable areas.

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Summary Table

Metric	Value
Total farms (2022)	51,760 farms (agriculture.ec.europa.eu)
Estimated tomato-specialized farms	~300 farms
Share of farms	~0.6 %
Total agricultural land (UAA)	519,000 ha
Tomato land area	3,000 ha
% of UAA	~0.6 %
% of arable land	~1.0 %

Interpretation

- Only a small fraction of farms (~0.6%) in Basilicata specialize in tomatoes.
- These farms cultivate about 0.6% of total ag land, but since tomatoes are high-value, their economic impact per hectare is significant.
- These specialized farms are concentrated in zones like Metapontino, where they represent a larger share of local farmland and income, even if small region-wide.

Specific numbers for Metapontino

Metapontino Agriculture Overview

- Total agricultural enterprises: ~5,000 farms (regione.basilicata.it)
- Total UAA (Utilised Agricultural Area): approx 74,000 ha, of which 21,000 ha are devoted to horticulture (ortofrutticolo) (basilicatatipica.it)

Tomato Production in Metapontino

- Processing tomatoes:
  - ~2,000 ha under cultivation
  - ISTAT reports ~2,083 ha of industrial tomatoes region-wide (2019), mostly in Metapontino (it.wikipedia.org)
  - Greenhouse (protected) tomatoes: ~30 ha (alsia.it)

➔ Total tomato area ≈ 2,030 ha

Metric	Value
Horticultural land	~21,000 ha
Tomato area	~2,030 ha
% of horticultural land	~9.7%
Total farms	~5,000
Avg tomato farm size assumed ~10 ha → ~203 farms	
% of farms specializing in tomato	~4%

Conclusion

- Nearly 1 in 10 hectares of vegetable/fruit land in Metapontino is used for tomato cultivation.
- Around 200–250 farms focus substantially on tomatoes—about 4% of all local farms.
- These farms are primarily medium-scale irrigated operations, critical to local agri-food dynamics and employment.
- Tomatoes occupy a lean but economically potent niche: 10% of horticultural area supports a significant proportion of local agri-labor, processing plants, and seasonal employment.
- A regional shock to tomato production would affect ~4% of farms directly, with spillover effects due to their integration with major vegetable value chains.

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Example: Adaptation of a 10-hectare tomato-specialized farm

Scenario	Income Loss	Income Recovery
❌ No Replacement	100% loss	€0
🌾 Replace with Wheat	91% loss	€3,000/year
🫒 Replace with Olives	77% loss	€8,000/year
🥒 Replace with Zucchini	29% loss	€25,000/year

Conclusion:

Tomato-specialized farms are highly exposed to production collapse. Even high-value replacements like zucchini only recover 70% of lost income. Without adaptation or support, the economic impact would be devastating.

2.12 Traditional farm adaptation policy

Economic relevance of tomato production for traditional farms, not specialized in tomatoes

Tomato production also holds **significant economic relevance** for **non-specialized farms** in Basilicata, especially in areas like the **Metapontino plain**. These are farms that don't grow tomatoes as their sole or primary crop but include them as part of a **diversified production system**. Here's a detailed assessment:

Who are these non-specialized farms?

- Farms growing multiple crops (e.g. cereals, vegetables, olives, grapes) but include 1–3 hectares of tomatoes as a high-return seasonal crop.
- They often use tomatoes to:
  - Generate cash flow in summer
  - Maximize returns from irrigated land
  - Fulfill contracts with local processors
  - Create employment opportunities (often for family labor or seasonal workers)

Economic relevance of these farms

1. High Gross Margin Contribution
   - Even on 1–3 ha, tomatoes can contribute:
     - €2,000–€15,000/year in net income
     - This is often 20–40% of a mixed farm's annual net profit
2. Stabilization Role
   - Tomatoes balance the lower margins of crops like wheat or alfalfa.
   - They offer predictable market demand through cooperatives or processing contracts.
3. Irrigation Payoff
   - Farms with irrigation capacity may use it exclusively for tomatoes, as the crop justifies the cost of water and labor.
   - On some farms, tomatoes are the only irrigated crop grown intensively.

Illustrative Example

Farm Type	Tomato Area	Other Crops	% Income from Tomatoes
Mixed crop-livestock	2 ha	Wheat, olives, sheep	~30%
Arable + horticulture	1.5 ha	Zucchini, peppers	~25%
Small family farm	1 ha	Grapes, cereals	~20–40% (seasonally)

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Risk if Tomatoes Are Lost

For these non-specialized farms, **losing tomato income** would mean:

- A sharp drop in **cash flow and liquidity** during summer.
- Less **labor demand**, affecting family members and seasonal workers.
- Reduced **use of irrigation systems**, leading to inefficiencies.

Summary

Impact Area	Relevance of Tomatoes
Income share	20–40% for many mixed farms
Strategic cash crop	Yes – especially June–August
Irrigation utilization	Often tied to tomato cultivation
Role in crop rotation	Moderate, with agronomic benefits

Bottom Line

Even for farms that are **not tomato-specialized**, tomatoes are a **key economic pillar** in their **diversified production strategy**. Removing tomatoes would require these farms to **restructure their cropping systems**, **seek alternative cash crops**, and **absorb income volatility**.

Simulation of income loss and replacement scenarios for a representative mixed farm in Basilicata

Here is a scenario analysis showing how losing tomatoes affects a representative **10-hectare mixed farm** in Basilicata:

Key Findings

- Without replacement, the farm loses €7,000 in income — a 47% drop.
- Replacing tomatoes with:
  - Wheat recovers some value but still results in a 43% loss.
  - Olives reduce the loss to 36.5%.
  - Zucchini, a high-value crop, reduces the loss to only 13.5%.

Implication

Tomatoes play a critical role in farm profitability, even when grown on a limited area. Effective crop substitution (like zucchini) can soften the economic blow but may require changes in irrigation, labor, or market access.

Change of production program over time to adapt to increasing drought

If no measures to improve water availability are taken, a common mixed farm in Basilicata will need to gradually restructure its production to adapt to increasing drought and heat stress. Here's a staged transition plan from 2025 to 2035, reflecting climate adaptation under water constraints, assuming:

- 10 hectares
- Initial crops: tomatoes (2 ha), wheat (4 ha), olives (2 ha), zucchini (2 ha)
- Increasing drought: severe yield decline in water-sensitive crops

2025–2027: Early Adjustment Phase

What Changes:

- Reduce tomato area from 2 ha to 1 ha due to water risk
- Begin experimenting with drought-tolerant legumes (e.g. chickpeas, lentils) on 1 ha
- Introduce drip irrigation on remaining tomatoes and zucchini (if budget allows)

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Crop Allocation

Crop	Area (ha)	Rationale
Tomatoes	1	Retain high-value crop in small area
Zucchini	1.5	Still feasible with early harvest
Legumes	1	Low water use, stable returns
Olives	3	Expand due to drought hardiness
Wheat	3.5	Maintain for rotation, lower yield

2028–2030: Structural Reallocation Phase

What Changes:

- Phase out tomatoes entirely as irrigation becomes unsustainable
- Introduce aromatic herbs or prickly pears on marginal plots
- Shift further toward dryland cropping systems

Crop Allocation:

Crop	Area (ha)	Rationale
Legumes	2.5	Reliable under low-rainfall conditions
Zucchini	1	Maintain spring production where feasible
Olives	4	Core perennial income base
Wheat	2	Support rotation and soil management
Aromatic crops	0.5	Niche income, low water need

2031–2035: Drought-Resilient Model

What Changes:

- Fully transition to **rainfed and semi-arid cropping**
- Focus on **perennials and extensive low-input systems**

Crop Allocation:

Crop	Area (ha)	Rationale
Olives	5	Anchored long-term resilience and value
Legumes	3	Core cash crop under climate constraint
Wheat	1	Rotation + occasional years with barley
Aromatic crops	1	For income diversification

Income Evolution Estimate

Year Range	Estimated Net Income (€)	Income Loss vs 2025 (%)
2025–2027	€14,000–16,000	—
2028–2030	€12,000–13,000	~15–20%
2031–2035	€10,000–11,000	~30%

Note: These figures assume no irrigation investments and reflect lower-yield but stable production under climate pressure.

Adaptation Priorities

1. **Crop substitution** → drought-tolerant, low-input crops
2. **Soil management** → mulching, organic matter retention
3. **Agroforestry and perennial crops** → olives, figs, almonds
4. **Market orientation** → organic legumes, herbs, or "climate-resilient" branding

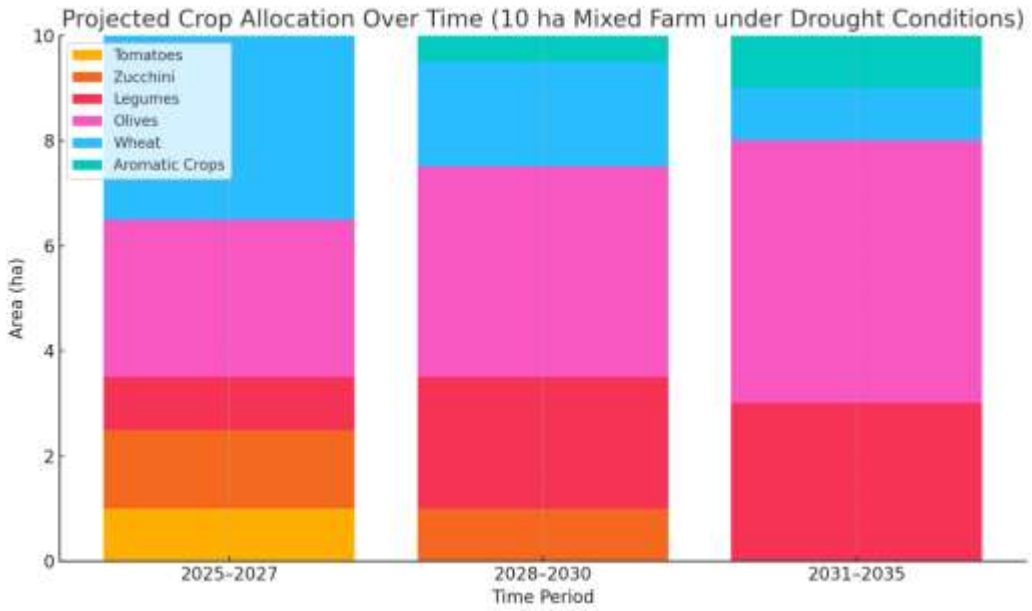
Visual crop rotation timeline for this adaptation path

Here is the visual timeline and table showing how a 10-hectare mixed farm could reallocate crops over time to adapt to increasing drought without water infrastructure investment:

- Tomatoes phase out early due to high water demand.
- Olives expand steadily as a drought-resilient backbone.
- Legumes and aromatic crops gain ground as low-water, income-stable options.

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Crop Allocation Timeline For Drought Adaptation

		Tomatoes	Zucchini	Legumes	Olives	Wheat	Aromatic Crops
1	2025–2027	1	1.5	1.0	3	3.5	0.0
2	2028–2030	0	1.0	2.5	4	2.0	0.5
3	2031–2035	0	0.0	3.0	5	1.0	1.0

Economic consequences of adaptation

Projected economic consequences of drought adaptation for a typical 10-hectare mixed farm in Basilicata:

Summary by Period:

Period	Net Income (€)	Loss vs Baseline (€)	Loss (%)
2025–2027	€12,800	—	—
2028–2030	€11,850	€950	7.4%
2031–2035	€11,800	€1,000	7.8%

Interpretation:

- The farm adapts with **only ~7–8% income loss** over time, thanks to strategic reallocation to drought-resilient crops.
- This represents a **stable economic trajectory without irrigation investment**, balancing lower water use with modest profitability.

Activities for facilitating adaptation

To facilitate **drought adaptation** for farmers in Basilicata—especially those who lack access to new water infrastructure—a coordinated strategy involving multiple actors is essential. Below is a practical breakdown of **who should do what**, organized by functional domain:

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Overview

1. Agronomic Support & Training

Responsible:

- ALSIA, University of Basilicata, CREA, Agricultural Cooperatives

What to Do:

- Develop and disseminate technical guidelines for drought-resilient cropping systems (legumes, olives, aromatics).
- Run training modules on:
  - Soil management under low-rainfall conditions
  - Crop rotation and dryland diversification
  - Organic and regenerative practices
- Create model farms and field demonstrations.

Target:

- Mixed farms, young farmers, cooperatives

2. Financial and Policy Instruments

Responsible:

- Regione Basilicata – Agriculture Department, AGEA, Masaf, EU (CAP programs)

What to Do:

- Launch targeted grants and risk-sharing schemes for farms switching from high-water crops to dryland systems.
- Prioritize CAP Pillar II Measures:
  - M10 (Agro-environment-climate)
  - M11 (Organic farming)
  - M6 (Farm diversification)
- Provide one-time transition subsidies to cover:
  - Initial yield loss
  - Equipment (e.g., weed control tools)
  - Soil fertility inputs (e.g., compost)

Target:

- Medium/small farms, especially in drought-prone areas

3. Market Development for New Crops

Responsible:

- Producer organizations, retail chains (e.g., Coop, Conad), Slow Food, export consortia

What to Do:

- Create contracts or guaranteed purchase agreements for:
  - Organic lentils, chickpeas, herbs, dry-farmed olives
- Support product branding around “climate-resilient” or “zero-irrigation” origin.
- Invest in processing units for legumes, herbs, oil, to boost value-added potential.

Target:

- Diversified farms, farmer groups, SME processors

4. Land Planning and Legal Support

Responsible:

- Local municipalities, Regione Basilicata, land registry offices, legal aid services

What to Do:

- Facilitate land consolidation or leasing programs to make adaptation viable at economic scale.
- Streamline permits for replanting, dryland conversion, or orchard establishment.
- Ensure legal clarity on land-use changes and subsidy eligibility.

Target:

- Fragmented landowners, young farmers

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5. Community Engagement and Knowledge Sharing

Responsible:

- Civil society (e.g. Legambiente, Slow Food Basilicata), farmers' unions, local schools

What to Do:

- Organize community events and fairs to highlight climate-smart farming.
- Collect and share local drought adaptation stories.
- Foster peer learning and intergenerational knowledge transfer.

Target:

- Smallholders, community leaders, schools

Summary Matrix

Area	Action	Lead Actor(s)	Beneficiaries
Training & Agronomy	Crop advice, demo plots, dryland techniques	ALSIA, universities, co-ops	Farmers, advisors
Policy & Finance	Grants, subsidies, income support	Regione, AGEA, CAP authorities	Medium/small farms
Market Access	Contracts, branding, local markets	Producer groups, retailers	Farmers, processors
Legal & Land Access	Permit simplification, leasing incentives	Municipalities, regional offices	Landowners, young farmers
Community & Culture	Events, peer learning, awareness	NGOs, schools, media	General public, rural youth

Implementation timeline

Implementation timeline for drought adaptation in Basilicata, showing who should take action, when, with which funding sources, and what milestones to aim for by 2027 and 2030. This roadmap ensures coordinated, realistic, and well-funded support for farmers transitioning away from water-intensive systems.

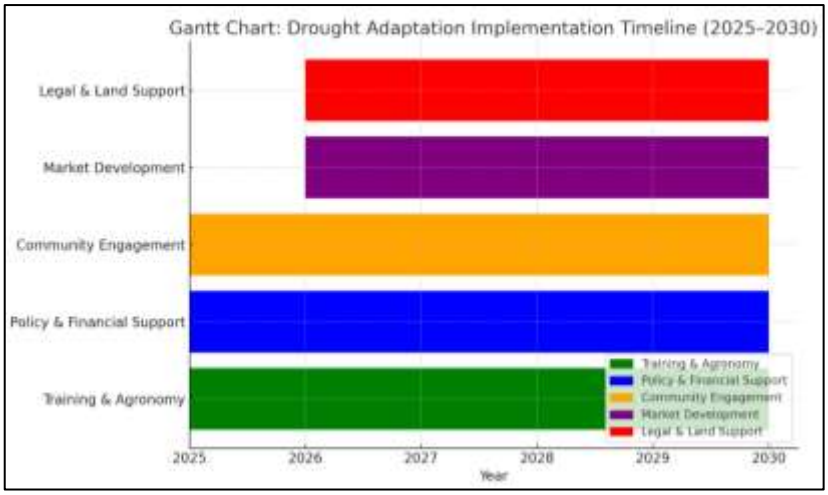
	Action Area	Lead Actor(s)	Primary Funding Sour	Start Date	Milestones by 2027	Milestones by 2030
1	Training & Agronomy	ALSIA, University of Basilicata, Cooperatives	CAP Pillar II (M1, M10), Regional RDP	2025 Q1	Training modules deployed; 10 demo farms operational	Wide access to drought-adapted crop guidance
2	Policy & Financial Support	Regione Basilicata, AGEA, EU CAP authorities	CAP Pillar II (M6, M10), NRRP Transition Funds	2025 Q2	First wave of subsidy recipients onboarded	Full coverage of transition subsidies
3	Market Development	Producer Organizations, Retailers, Slow Food	ERDF, CAP M9, private retail co-funding	2026 Q1	Legume & herb contracts piloted with 3 cooperatives	Functional supply chains for legumes/herbs/oil
4	Legal & Land Support	Municipalities, Regione Basilicata, Land Registry	CAP M4, Regional land development funds	2026 Q2	Land access portal and advisory support launched	Land zoning & orchard transition streamlined
5	Community Engagement	NGOs, Schools, Farmers' Unions	CAP M1, Creative Europe, regional cultural funds	2025 Q3	Local awareness campaigns in 10 municipalities	Community-led farm innovation hubs active

Gantt chart

Gantt chart showing the timeline for implementing drought adaptation measures in Basilicata from **2025 to 2030**. Each bar represents when major activity areas—such as training, subsidies, market building, and land policy reforms—should be active.

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Financial consequences of activities

Funding breakdown for each **actor and activity area** in the drought adaptation strategy for Basilicata (2025–2030):

- Training & Agronomy: €18M total – half directed to direct farm support.
- Policy & Financial Support: Largest share at €60M – most funds go to transition subsidies.
- Community Engagement: Low-cost but high-impact (€3M).
- Market Development: €18M – supports infrastructure and price mechanisms.
- Legal & Land Support: €7M – modest investment for enabling land access and advisory services.

	Action Area	Lead Actor(s)	Implementation Period	Funds for Own Activities (€M)	Funds for Supporting Farmers (€M)	Total Funds (€M)
1	Training & Agronomy	ALSIA, University, Cooperatives	2025–2030	6	12	18
2	Policy & Financial Support	Regione Basilicata, AGEA, EU CAP	2025–2030	25	35	60
3	Community Engagement	NGOs, Schools, Farmers' Unions	2025–2030	2	1	3
4	Market Development	Producer Organizations, Retailers	2026–2030	8	10	18
5	Legal & Land Support	Municipalities, Regional Land Offices	2026–2030	4	3	7

Link with potential funding programs

	Action Area	Lead Actor(s)	Implementation Period	Funds for Own Activities (€M)	Funds for Supporting Farmers (€M)	Total Funds (€M)	Linked Funding Programs
1	Training & Agronomy	ALSIA, University, Cooperatives	2025–2030	6	12	18	CAP Pillar II M1, M10; Regional RDP (Rural Development Program)
2	Policy & Financial Support	Regione Basilicata, AGEA, EU CAP	2025–2030	25	35	60	CAP Pillar II M6, M10; NRRP Transition Funds
3	Community Engagement	NGOs, Schools, Farmers' Unions	2025–2030	2	1	3	CAP Pillar II M1; Creative Europe; Regional culture funds
4	Market Development	Producer Organizations, Retailers	2026–2030	8	10	18	CAP M9 (producer groups); ERDF; private co-funding
5	Legal & Land Support	Municipalities, Regional Land Offices	2026–2030	4	3	7	CAP M4; Regional land access programs

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2.13 Coordination

Is there a coordination scheme in place that could coordinate

Currently, there is no formal, permanent coordination scheme in place in Basilicata specifically designed to manage a multi-actor, cross-program drought adaptation strategy like the one described. However, several institutional mechanisms could be adapted or expanded to play this role:

Potential Coordination Structures (Adaptable)

1. **Tavolo Verde Regionale (Regional Green Table)**
   - Led by: Regione Basilicata – Assessorato Agricoltura
   - Current Role: Policy dialogue forum between government, farmer unions, and environmental groups.
   - Potential: Could be expanded into a Drought Adaptation Task Force, involving:
     - ALSIA (agronomic coordination)
     - AGEA (funding linkage)
     - University of Basilicata (technical monitoring)
     - Cooperatives and civil society (implementation interface)
2. **RDP Monitoring Committee (Comitato di Sorveglianza del PSR)**
   - EU-mandated structure overseeing CAP Pillar II funds.
   - Could serve as a financial oversight body for adaptation funding streams if properly scoped and resourced.
3. **ALSIA as Technical Coordinator**
   - Already a lead player in agri-innovation.
   - Could house a Regional Adaptation Hub to:
     - Host data and guidance platforms
     - Coordinate training and demonstration programs
     - Report annually on adaptation progress

Recommendation

Create a “Coordination Cell for Climate Adaptation in Agriculture” (CCCAA)

Feature	Description
Host Institution	Regione Basilicata – Assessorato Agricoltura
Secretariat	Staff seconded from ALSIA and the RDP Monitoring Unit
Participants	AGEA, universities, producer orgs, NGOs, municipalities
Mandate	Coordinate actions, align funding, track outcomes
Launch Timeline	Q4 2025
Funding Source	CAP Technical Assistance + NRRP Admin Costs

Terms of Reference for such a coordination body?

Objective Establish a multi-actor coordination platform in Basilicata to manage, align, and monitor the implementation of drought adaptation strategies in the agricultural sector.
1. Name of Entity Coordination Cell for Climate Adaptation in Agriculture (**CCCAA**)
2. Host Institution Regione Basilicata – Assessorato Agricoltura
3. Secretariat - Staff seconded from ALSIA - RDP Monitoring Committee liaison staff
4. Key Functions - Coordinate planning and funding activities across actors - Align CAP Pillar II, NRRP, and ERDF funding for drought adaptation - Oversee training programs and technical rollouts led by ALSIA and universities - Track implementation milestones and flag delays - Produce annual report and evaluation on adaptation progress - Serve as point of contact for EU climate adaptation funds and initiatives
5. Stakeholders Involved - ALSIA (technical secretariat, agronomic coordination) - AGEA (fund management and CAP compliance) - University of Basilicata (data and R&D support) - Farmer cooperatives and unions (implementation feedback) - Municipalities (land use and legal support) - NGOs and civil society (community outreach)

Funded by the European Union

The ECO-READY project has received funding from the European Union’s Horizon Europe Research and Innovation Programme under grant agreement n° 101084201

6. Launch Timeline - **Q3 2025**: Executive approval by Regional Council - **Q4 2025**: Secretariat staffed; stakeholders confirmed - **Q1 2026**: First coordination workshop and funding call alignment
7. Funding Sources - CAP Technical Assistance (Measure TA) - National Recovery and Resilience Plan (administrative coordination budget) - Regional operational funding (staff and logistics)
8. Deliverables - Adaptation Action Tracker (web-based dashboard) - Annual Report to Regione and EU partners - Coordination matrix of funding, activities, and actors - Stakeholder engagement log and communication outputs
9. Legal Format - Non-permanent advisory and coordination body - Formalized by Regional Council Decision (Delibera di Giunta Regionale) - Functions under authority of Assessorato Agricoltura with cross-sectoral reach
10. Evaluation - First review in 2027 with potential for renewal and budget scaling

Conclusion CCCAA will serve as a cost-effective, cross-cutting mechanism to maximize the impact of climate adaptation investments in agriculture, ensuring transparency, accountability, and farmer engagement across Basilicata.

Proposal on the organization of a suitable coordination body

Title Establishment of the "Regional Coordination Unit for Agricultural Climate Resilience" (**RCU-ACR**)
Objective To provide a structured, accountable and participatory platform to coordinate drought and climate adaptation strategies in the agricultural sector of Basilicata, aligning resources, actors, and objectives under one governance framework.

1. Organizational Structure

Governing Board - Chaired by Regione Basilicata – Assessorato Agricoltura - Voting members: ALSIA, AGEA, University of Basilicata, representatives from major farmer cooperatives, one municipal delegate, and one civil society representative
Executive Secretariat - Staffed by seconded personnel from ALSIA and RDP Monitoring Committee - Responsible for logistics, reporting, stakeholder communication, and coordination
Thematic Working Groups - Water & Soil Management - Crop Diversification & Market Integration - Land Use & Legal Transition - Community Outreach & Cultural Adaptation

2. Core Functions

Coordinate implementation of adaptation projects funded by CAP, NRRP, ERDF - Monitor funding disbursement and results across public and private actors - Serve as platform for resolving implementation bottlenecks - Maintain an integrated action matrix (who does what, where, when, and with what resources) - Provide scientific and operational feedback to Regione and EU bodies - Ensure integration with EU Mission on Adaptation and Farm to Fork goals

3. Legal & Institutional Anchoring

Established by Regional Council Resolution (Delibera di Giunta Regionale) - Linked to the Regional Rural Development Program structure - Recognized as a consultative body for adaptation-related measures

4. Budget and Funding Sources (2025–2030)

CAP Technical Assistance: €3M - NRRP Administrative Resources: €2M - Regione Basilicata operational funds: €1.5M - In-kind contributions (staff, meeting venues): ALSIA, AGEA, universities

Total Operational Budget: **€6.5 million over 6 years**

Funded by the European Union

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5. Timeline & Milestones

Q3 2025: Legal foundation and stakeholder agreement - **Q1 2026**: Staff recruitment and first Board meeting - **Q2 2026**: Launch of action matrix and dashboard - **2027 & 2029**: Formal mid-term and final reviews

6. Deliverables

Annual Regional Adaptation Report (technical + policy) - Open-access action dashboard (mapping projects and actors) - Stakeholder feedback system and participatory review process - Regional briefing for EU funding alignment (biannually)

Conclusion

The RCU-ACR will institutionalize climate resilience coordination in Basilicata's agricultural sector, enabling more efficient use of funds, stronger stakeholder engagement, and measurable progress in adapting to drought and climate risks.

Necessary funds (optimal and minimal) for establishing and running such a coordination body

Detailed breakdown of the necessary funds to establish and operate the Regional Coordination Unit for Agricultural Climate Resilience (RCU-ACR) from 2025 to 2030:

- Minimal scenario: €3.3 million – allows for basic staffing, coordination, and reporting.
- Optimal scenario: €6.5 million – ensures full stakeholder engagement, technical capacity, digital systems, and innovation support.

This comparison supports strategic decision-making based on available resources and policy ambition.

		Cost Category	Minimal Funding (€M, 2025–2030)	Optimal Funding (€M, 2025–2030)
1	0	Personnel & Secretariat Staff	1.0	1.8
2	1	Technical and Legal Experts (Advisory)	0.5	1.0
3	2	Stakeholder Coordination & Events	0.4	1.2
4	3	Monitoring & Dashboard Systems	0.6	1.2
5	4	Public Reporting and Communication	0.3	0.5
6	5	Operational Logistics (Travel, IT, Facilities)	0.3	0.5
7	6	Contingency and Innovation Reserve	0.2	0.3
8	Total	TOTAL	3.3	6.5

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2.2 Scenario: Keeping tomato production at present level

If present tomato production should continue, what activities would be needed

If the government of Basilicata chooses to maintain current levels of tomato production despite increasing drought and climate risks, a stabilization scenario would require intensive public and private intervention.

Overview

1. Water Security & Irrigation Efficiency

Activities:

- Modernize existing irrigation infrastructure (pipelines, reservoirs, canals).
- Expand access to drip irrigation systems and precision irrigation tech (sensors, timers).
- Improve water storage and reuse capacity (e.g., rainwater harvesting, treated water).
- Launch real-time water allocation management platforms.

Responsible Actors:

- Consorzi di Bonifica, ALSIA, Regione Basilicata, irrigation cooperatives

Funding Needs (2025–2030):

- €25–40M (infrastructure + farm-level incentives)

2. Resilient Agronomy & Crop Breeding

Activities:

- Develop and distribute drought-tolerant tomato varieties.
- Test heat-resistant cultivars under regional field conditions.
- Fund research stations to trial stress-tolerant tomato systems (e.g., short cycle, shaded covers).

Responsible Actors:

- University of Basilicata, CREA, seed companies, ALSIA

Funding Needs:

- €5–8M (research, trials, farmer extension)

3. Production Cost Stabilization

Activities:

- Introduce crop insurance schemes against heat and water stress.
- Create a Tomato Risk Fund for stabilizing producer income in dry years.
- Offer subsidies for irrigation energy costs (e.g., solar pumping).

Responsible Actors:

- AGEA, MASAF, insurance agencies, cooperatives

Funding Needs:

- €10–15M (public risk instruments, premium support)

4. Agro-Industrial Coordination

Activities:

- Coordinate with processors to flex planting/harvest schedules to adjust for drought timing.
- Promote flex contracts with variable pricing based on climate stress.
- Improve cold storage and transport efficiency to reduce field losses.

Responsible Actors:

- Tomato processors, OPs, regional food logistics bodies

Funding Needs:

- €5–10M (subsidies, logistics improvements)

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5. Targeted Training and Support

Activities:

- Train farmers in water-saving practices and stress management strategies.
- Provide financial planning and diversification training to tomato growers.
- Launch advisory hotlines during critical summer stress periods.

Responsible Actors:

- ALSIA, agricultural associations (Coldiretti, CIA), co-ops

Funding Needs:

- €2–3M (training materials, outreach)

Summary Table: Stabilization Scenario Requirements

Domain	Key Activities	Estimated Funding (2025–2030)	Lead Actors
Water Infrastructure	Modernization, sensors, storage	€25–40M	Regione, consortia, co-ops
Crop Resilience & Breeding	Drought-tolerant varieties, trials	€5–8M	CREA, ALSIA, University
Risk Management	Insurance, fund, energy subsidies	€10–15M	AGEA, MASAF
Agro-Industry Coordination	Processing alignment, storage, logistics	€5–10M	Processors, OPs
Farmer Training	Practices, financial planning, hotlines	€2–3M	ALSIA, co-ops, advisors

Trade-Offs

- **Costly** and **resource-intensive** path compared to adaptation/transition strategies.
- Requires **ongoing support**, not one-off investment.
- Maintains a vulnerable system under pressure rather than transforming it.

Policy Brief: Stabilization vs. Adaptation Strategy for Tomato Production in Basilicata

Objective To support strategic decision-making in Basilicata's agricultural policy by comparing two distinct paths for responding to climate-induced risks to tomato production: (1) Stabilization of current tomato output, and (2) Gradual adaptation and diversification.

Scenario 1: Stabilization of Tomato Production

Goal: Maintain current levels of tomato production despite increasing drought and climate stress.
Key Activities: - Modernize irrigation systems (pipes, reservoirs, drip infrastructure) - Expand farm access to sensors and precision irrigation - Breed and distribute drought-tolerant tomato varieties - Introduce crop insurance and Tomato Risk Fund - Coordinate harvest timing and storage with processors - Train growers in water-stress and climate risk management
Estimated Public Investment (2025–2030): €50–80 million
Pros: - Preserves existing supply chains and agro-industrial facilities - Avoids disruption of specialized tomato farms and labor systems - Buys time for long-term water system investment
Cons: - High and ongoing cost of maintaining fragile system - Environmental stress may still reduce yields despite investment - Opportunity cost of delaying crop diversification

Scenario 2: Adaptation and Diversification Strategy

Goal: Gradually reduce tomato dependency and transition to more drought-resilient cropping systems.
Key Activities: - Support farmers to shift toward legumes, aromatics, olives, and zucchini - Provide training in dryland agronomy and marketing - Facilitate access to processing chains for new crops - Create legal and financial tools for land use transition - Invest in community and cultural support for adaptation

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Estimated Public Investment (2025–2030): €25–35 million
Pros: - Builds long-term resilience against climate and water risks - Diversifies farmer income and market options - Lower per-hectare subsidy and risk exposure over time
Cons: - Requires changes to farm management and infrastructure - May lead to short-term income loss during transition - Needs sustained coordination and market development

Strategic Trade-Offs

Criterion	Stabilization	Adaptation
Cost (public funds)	High (€50–80M)	Moderate (€25–35M)
Climate resilience	Low–Moderate	High
Disruption to farms	Low	Medium
Economic diversification	Low	High
Long-term viability	Uncertain	Strong

Conclusion

While stabilizing tomato production may be politically and economically appealing in the short term, it involves high recurring costs and increasing systemic fragility. A structured adaptation strategy offers a more sustainable, cost-effective, and climate-smart path forward, with transitional support.

Recommendation

Establish a hybrid policy: maintain support for strategic tomato zones while launching regional adaptation programs and transition funding for diversified farms.

2.3 Scenario: Hybrid strategy

Hybrid strategy and funding proposal

To secure multi-source funding for a **hybrid agricultural strategy** that preserves viable tomato production zones while enabling farmers in vulnerable areas to transition to drought-resilient crops and systems.

1. Title of Program
Resilient Tomato and Crop Diversification Initiative (RTC-DI)
2. Implementing Authority
Regione Basilicata – Assessorato Agricoltura
3. Lead Partners
- ALSIA (technical lead)
- Consorzi di Bonifica (irrigation)
- AGEA (financial coordination)
- University of Basilicata, CREA (research and training)
- Farmer cooperatives, OPs (implementation)
- Municipalities and NGOs (outreach and land support)

4. Strategic Justification
Basilicata faces rising water stress that threatens tomato production, a key agro-industrial pillar. A combined stabilization-adaptation approach ensures food chain continuity while building long-term climate resilience.

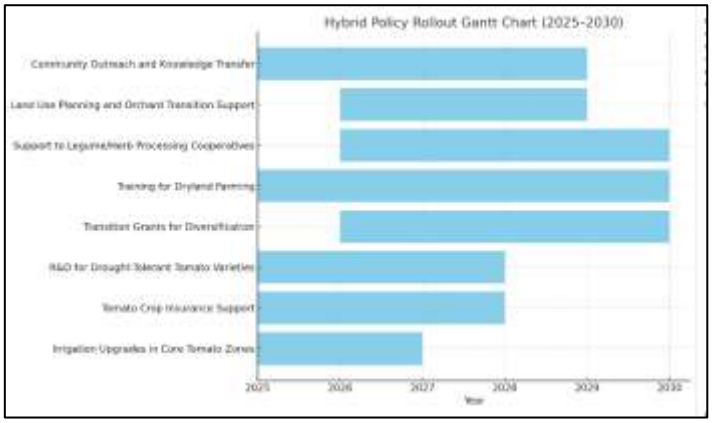
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5. Activities and Timeline (2025–2030)

Activity Area	Timeline	Budget(€M)	Description
Irrigation Upgrades in Core Tomato Zones	2025–2027	18	Improve water delivery, expand drip systems
Tomato Crop Insurance Support	2025–2028	6	Subsidize climate-indexed risk insurance
R&D for Drought-Tolerant Tomato Varieties	2025–2028	5	Develop heat-resilient, water-efficient cultivars
Transition Grants for Diversification	2026–2030	12	Per-hectare support for switching to dryland crops
Training for Dryland Farming	2025–2030	3	Agronomic and financial training for transitioning farms
Support to Legume/Herb Processing Cooperatives	2026–2030	5	Infrastructure and coordination grants
Land Use Planning and Orchard Transition	2026–2029	4	Municipal zoning, orchard support, leasing platforms
Community Outreach and Knowledge Transfer	2025–2029	2	Cultural engagement, local knowledge diffusion

Total Requested Funding (2025–2030): €55 million

GANTT chart



Funded by the European Union

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6. Engagement of groups

	Activity Area	Lead Actors	Implementation Phase	Estimated Funding (€M)
1	Irrigation Upgrades in Core Tomato Zones	Consorzi di Bonifica, ALSIA	2025–2027	18
2	Tomato Crop Insurance Support	AGEA, Insurance Consortia	2025–2026	6
3	R&D for Drought-Tolerant Tomato Varieties	University of Basilicata, CREA	2025–2028	5
4	Transition Grants for Diversification	Regione Basilicata, AGEA	2026–2030	12
5	Training for Dryland Farming	ALSIA, Cooperatives	2025–2030	3
6	Support to Legume/Herb Processing Cooperatives	Producer Groups, OPs	2026–2030	5
7	Land Use Planning and Orchard Transition Support	Municipalities, Land Registries	2026–2029	4
8	Community Outreach and Knowledge Transfer	NGOs, Schools, ALSIA	2025–2029	2

7. Proposed Funding Sources

- CAP Pillar II: Measures M4, M6, M9, M10, M11, M16, Technical Assistance
- NRRP (Next Generation EU): Administrative capacity, climate-smart farming
- ERDF (Regional Competitiveness): Processing infrastructure, land use
- National Co-financing: Direct subsidies and training logistics
- Private Sector: Retailer co-investment in value chain diversification

8. Expected Outcomes by 2030

- 2,000 ha tomato preserved in viable zones
- 500–800 ha transitioned to legumes, olives, or herbs
- 200+ farmers trained in climate-resilient systems
- 5 new value chains operational for alternative crops
- Full integration of climate risk in farm planning and subsidy policy

9. Monitoring and Governance

- Managed by Regional Coordination Unit for Agricultural Climate Resilience (RCU-ACR)
- Annual reporting, adaptive re-budgeting, and participatory reviews
- Dashboard to track project, financial, and agronomic indicators

Conclusion

This hybrid strategy enables a just and climate-smart transformation of tomato production in Basilicata. It protects regional competitiveness while preparing farms and supply chains for long-term viability. Funding is urgently needed to launch implementation before irreversible drought impacts take hold.

3 Integrating olive production into analysis

Relevance of hybrid strategy for olive production

The hybrid proposal is **highly relevant for olive production**, especially under the **adaptation track** of the hybrid strategy.

1. Strategic Role in Diversification

- **Olives are one of the key dryland crops** identified for transitioning farms away from tomatoes in drought-prone areas.

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- The proposal earmarks **500–800 ha for transition**, a portion of which is suited for new or expanded olive groves.

2. Eligible for Key Support Instruments

Measure	Applicability to Olives
Transition Grants (M10/M11)	Supports switching from irrigated tomatoes to olives (organic or traditional)
Orchard Transition Support	Technical advice, planting incentives, land-use planning help
Training for Dryland Farming	Focus includes olive management under climate stress
Processing/Market Development (M9)	Cooperatives can apply for oil pressing, branding, export facilitation

3. Environmental Co-Benefits

- Olive groves offer:
  - **Deep rooting** and **drought resilience**
  - **Carbon sequestration** potential
  - **Landscape stabilization** in erosion-prone areas

  These make them ideal within a **climate-smart land use transition** framework.

4. Synergies with Community and Cultural Elements

- Olive oil holds **deep cultural significance** in Basilicata.
- Activities such as **knowledge transfer, youth engagement**, and **community fairs** can easily integrate **olive oil identity and heritage** as drivers of adaptation acceptance.

Additional Opportunities (Optional Extensions)

- Introduce **targeted subsidies** for intercropping olives with legumes or aromatics (agroforestry).
- Expand support for **value-added processing and PDO branding** (Protected Designation of Origin).
- Develop **digital mapping** of underutilized lands suitable for olive expansion.

Summary:

The current hybrid policy already strongly supports olive production as part of the solution. To further increase its impact, a few olive-specific elements (e.g., intercropping incentives, PDO market access) could be explicitly included in the proposal.

Funding Proposal: Hybrid Climate Strategy for Tomato and Olive Production in Basilicata (2025–2030)

To secure multi-source funding for a hybrid agricultural strategy that preserves viable tomato production zones while enabling farmers in vulnerable areas to transition to drought-resilient crops and systems.

1. Title of Program

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2. Implementing Authority

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- University of Basilicata, CREA (research and training)
- Farmer cooperatives, OPs (implementation)
- Municipalities and NGOs (outreach and land support)

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4. Strategic Justification

Basilicata faces rising water stress that threatens tomato production, a key agro-industrial pillar. A combined stabilization-adaptation approach ensures food chain continuity while building long-term climate resilience.

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Activity Area	Timeline	Budget (€M)	Description
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Total Requested Funding (2025–2030): €55 million

6. Proposed Funding Sources

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- Private Sector: Retailer co-investment in value chain diversification

7. Expected Outcomes by 2030

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- 200+ farmers trained in climate-resilient systems
- 5 new value chains operational for alternative crops
- Full integration of climate risk in farm planning and subsidy policy

8. Monitoring and Governance

- Managed by Regional Coordination Unit for Agricultural Climate Resilience (RCU-ACR)
- Annual reporting, adaptive re-budgeting, and participatory reviews
- Dashboard to track project, financial, and agronomic indicators

Addendum: Olive Sector Integration

The RTC-DI explicitly includes olive production as a core pillar of the adaptation path. Support for olive expansion and regeneration is woven into multiple action lines:

- Transition Grants are applicable to farms converting from tomato or fallow land to olive groves.
- Land Use Planning efforts prioritize orchard expansion in dryland-suitable zones.
- Training modules include pruning, water stress management, and integrated pest strategies for olives.
- Processing Support will be extended to olive oil cooperatives, including cold-press facilities and PDO branding assistance.
- Community Outreach highlights the cultural value of olive oil production in climate-smart rural identities.

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Further actions may include:

- Agroforestry schemes combining olives with legumes or herbs
- EU CAP eco-scheme alignment for biodiversity and soil benefits in olive groves
- Integration with tourism and gastronomic promotion networks

Conclusion

This hybrid strategy enables a just and climate-smart transformation of tomato production in Basilicata. It protects regional competitiveness while preparing farms and supply chains for long-term viability. The integrated olive track further strengthens landscape resilience, cultural continuity, and economic diversification. Funding is urgently needed to launch implementation before irreversible drought impacts take hold.

Tomato and olive production stabilization strategy for Basilicata (2025-2030)

Objective
To outline the policy and investment measures required if the government of Basilicata chooses to maintain current levels of tomato production and ensure the stability and expansion of olive production under increasing climate stress.

1. Strategic Rationale

Tomatoes and olives are critical to Basilicata's agro-industrial economy and cultural heritage. With rising water scarcity and temperature extremes, both sectors face stress but also provide complementary pathways for stabilization.

- **Tomatoes**: Require active irrigation, infrastructure, and varietal innovation.
- **Olives**: Naturally drought-resilient, but require support for quality, processing, and disease resilience.

2. Key Pillars of Intervention

A. Water Security and Irrigation Management

- Modernize canal and pipeline systems for tomato fields
- Expand drip irrigation to ensure efficient water use
- Prioritize olives for low-input zones, maintaining minimal supplemental irrigation where needed

Estimated Investment: €30–45 million

B. Climate-Resilient Varietal Innovation

- R&D on heat- and drought-tolerant tomato hybrids
- Breeding support for olive cultivars resilient to Xylella, Verticillium, and heat stress

Estimated Investment: €6–8 million

C. Financial Risk Protection

- Subsidized crop insurance for tomato and olive growers
- Creation of sector-specific Risk Funds for harvest volatility and market losses

Estimated Investment: €8–12 million

D. Support for Processing and Supply Chains

- Cold chain improvements and storage hubs for tomatoes
- Investments in modern olive presses and oil certification (e.g., DOP, organic)
- Development of climate-resilient marketing identity (e.g., "Zero-Irrigation Olives")

Estimated Investment: €10–15 million

E. Training and Extension Services

- On-farm advice for water-stress management and integrated pest management
- Digital advisory services for weather, irrigation, and pruning schedules
- Farm succession and generational renewal schemes

Estimated Investment: €4–6 million

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3. Governance and Coordination

- Regional Coordination Unit for Agricultural Climate Resilience (RCU-ACR) to oversee rollout
- Sectoral working groups for tomatoes and olives under the Tavolo Verde
- Engagement of producer organizations, irrigation consortia, and municipalities

4. Monitoring Indicators (by 2030)

- 2,000 ha of stabilized tomato production
- 1,500 ha of high-quality olive groves under resilient management
- 5 new tomato varieties and 3 olive cultivar trials in use
- 70% of tomato farms using precision irrigation
- 60% of olive oil production processed under PDO/organic systems

5. Funding Sources

- CAP Pillar II (Measures M4, M5, M10, M11, M17, M22)
- ERDF for processing and certification
- National co-financing for irrigation and risk instruments
- NRRP resilience lines for agriculture and landscape management

Conclusion

Maintaining tomato and olive production in Basilicata under climate pressure requires targeted, cost-intensive, but feasible investments. Stabilizing both sectors preserves employment, cultural identity, and agri-food competitiveness while preparing for long-term resilience. This scenario forms the baseline for a coordinated response between government, farmers, and processors.

Rollout timeline for tomato and olive stabilization strategy

Here is the rollout timeline with assigned lead actors and estimated funding for each major activity in the tomato and olive stabilization strategy. This provides a clear view of when and how each intervention should be implemented, along with who is responsible and the required investment.

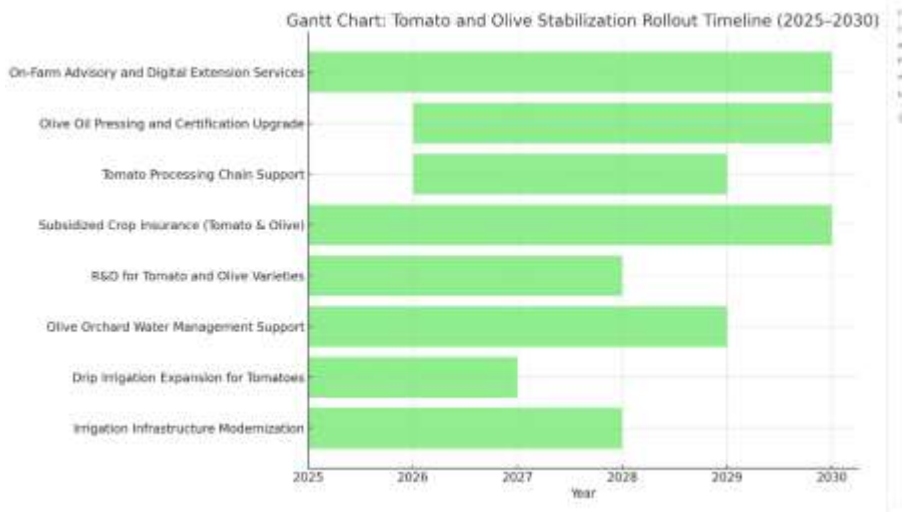
	Activity Area	Lead Actors	Timeline	Estimated Funding (€k
1	Irrigation Infrastructure Modernization	Consorzi di Bonifica, Regione Basilicata	2025–2028	25
2	Drip Irrigation Expansion for Tomatoes	ALSIA, Cooperatives	2025–2027	15
3	Olive Orchard Water Management Support	ALSIA, Municipalities	2025–2029	5
4	R&D for Tomato and Olive Varieties	University of Basilicata, CREA	2025–2028	8
5	Subsidized Crop Insurance (Tomato & Olive)	AGEA, Insurance Funds	2025–2030	10
6	Tomato Processing Chain Support	OPs, Tomato Processors, Regione	2026–2029	6
7	Olive Oil Pressing and Certification Upgrade	Olive Cooperatives, Chambers of Commerce	2026–2030	9
8	On-Farm Advisory and Digital Extension Services	ALSIA, Digital Innovation Hubs	2025–2030	4

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Gantt

The Gantt chart visualizes the rollout timeline for the tomato and olive stabilization strategy (2025–2030). It shows the duration and sequence of each major activity, helping to coordinate efforts across sectors and years.



Difference between the rollout plans of the stabilization and the hybrid strategies considering tomato and olive production

The key differences between the **current stabilization rollout plan** and the **previous hybrid strategy rollout** lie in their **scope, emphasis, and intended outcomes**.

Strategic Focus

Aspect	Hybrid Strategy	Stabilization Plan
Primary Goal	Adapt to climate by reducing tomato reliance	Preserve tomato and olive production at current levels
Production Logic	Selective support for viable tomato zones; diversify elsewhere	Uniform support to maintain all production
Crop Scope	Tomatoes (viable) + legumes, herbs, olives	Tomatoes and olives equally

Funding Profile

Measure/Area	Hybrid (€M)	Stabilization (€M)	Difference & Justification
Irrigation Systems	18	25	More extensive in stabilization to preserve tomato zones
Insurance and Risk Support	6	10	Expanded to include olive producers
Crop R&D (Tomato-focused vs. Both)	5	8	Olive cultivar development added
Value Chain/Processing Support	10	15 (6+9)	Olive oil certification and tomato storage/logistics upgraded
Training and Advisory	3	4	Includes digital extension and orchard-specific modules
Transition Support (Grants etc.)	12	0	Omitted in stabilization; no crop-switching planned

Total

- **Hybrid Strategy**: ~€55 million
- **Stabilization Plan**: ~€76 million

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Implementation Timeline

Timing Focus	Hybrid Strategy	Stabilization Plan
Early years (2025–2027)	Training, irrigation upgrades, pilot transitions	Major irrigation investment, insurance activation
Later years (2028–2030)	New value chains, market transitions	Extension services, supply chain resilience

Actor Roles

Role Category	Hybrid Plan	Stabilization Plan
Farmers	Transition to new crops + efficient tomato	Continue tomato/olive with better infrastructure
ALSIA	Training + transition monitoring	Irrigation advice + orchard support
Universities/CREA	Rotation systems, diversification research	Cultivar development (both crops)
Consortia	Some zones phased out	Investment to reinforce networks

Risk vs Resilience

Dimension	Hybrid Strategy	Stabilization Plan
Resilience	High long-term drought adaptation	Moderate, depends on infrastructure
Short-term risk	Transition disruptions possible	Lower disruption, higher climate risk
Future costs	Declining public burden over time	Ongoing support likely necessary

Summary

Criteria	Hybrid Strategy	Stabilization Plan
More climate-resilient	✅	❌
More cost-effective	✅	❌
Less disruptive initially	❌	✅
Olive-specific support	Partial	Full
Tomato preservation focus	Selective	Universal

4 Consolidation

Hybrid plan for Basilicata that includes climate-resilient strategies for both tomatoes and olives, aligns with limited public funding, and prioritizes supporting farm income and regional employment.

Introduction and Context

Basilicata is a predominantly rural region of southern Italy with a mix of mountainous and hilly terrains and only about 8% plains. Agriculture plays an outsized role in the region's economy (accounting for ~5.8% of regional value added, versus ~2.2% nationally), and two of its flagship crops are **processing tomatoes** and **olive groves**. In recent years, these sectors have been under severe stress from climate change: extended **droughts and heatwaves** have led to water scarcity and crop failures.

In 2024, for example, Basilicata faced a *"dramatic situation"* with reservoirs at historic lows and harvests of staple crops decimated. About **3,000 hectares** of tomatoes in the northeastern **Lavello plain** were at risk of very low yields due to high summer temperatures and insufficient irrigation water. Similarly, the olive sector saw a near-total collapse – a **95% drop** in regional olive oil output – as prolonged drought and extreme heat ravaged rain-fed groves. Most olive farms in Basilicata are small family holdings (over **32,000 farms** cultivating ~27,000 ha in total), so this climate disaster not only threatens an important industry but also the livelihoods of thousands of rural families.

At the same time, public resources for intervention are limited, and any strategy must maximize cost-effectiveness and leverage multiple funding sources. The challenge, therefore, is to **boost climate resilience** in tomato and olive production while **supporting farm incomes and regional employment** – all under fiscal constraints. This hybrid plan addresses that challenge through a balanced approach: stabilizing production in

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the most vulnerable zones, **transitioning to more resilient and diversified systems**, and carefully phasing investments and support from 2025 to 2030. The strategy integrates short-term safeguards (to prevent imminent collapse of farm incomes) with long-term adaptations (to thrive under future climate stresses), and identifies how public and private financing can be combined. Crucially, both tomatoes and olives are included synergistically, recognizing that these sectors together underpin Basilicata's agro-economy and rural jobs.

The following sections detail: **(1)** priority zones and farm types for stabilization support, **(2)** targeted transitions to resilient/diverse systems, **(3)** a timeline for rolling out measures from 2025–2030, **(4)** specific actions with estimated costs and benefits, **(5)** funding sources (public and private), and **(6)** expected impacts on employment and income stability. This plan is structured as a practical roadmap, with clear milestones and responsibilities, to ensure effective implementation despite climate uncertainties and budget limitations.

Zones and Farm Types for Stabilization Support: Tomato Production Zones in Need of Stabilization

Zones

Basilicata's tomato cultivation is concentrated in two key lowland areas that require immediate stabilization support:

- **Lavello Plain (Vulture–Alta Bradano area, Province of Potenza)** – This northeastern plain along the border with Apulia is a prime zone for **processing tomatoes**, accounting for roughly 2,000–3,000 ha of production. Farms here are relatively large and specialized, often organized via producer organizations, and rely on irrigation from regional dams. In summer 2024, the Lavello area was hit by an acute water crisis: reservoir levels in Basilicata were **210 million m³ below the previous year**, with only one-third of total capacity available. The Basilicata irrigation consortium had to sharply ration water, leaving tomato fields with only **600 liters/second for 3,000 ha** – far below crop needs. This led to severe yield losses, with many plants showing stunted growth and apical rot from heat/water stress. Without intervention, farmers in this area face financial ruin as they struggle to pay for equipment and inputs while yields dwindle. **Stabilization support** in this zone should focus on securing water (both short-term emergency supply and long-term irrigation improvements) and providing income relief for growers hit by climate-induced losses.

- **Metapontino Plain (Ionian coast, Province of Matera)** – The coastal plain near Metaponto is another important horticultural area, traditionally known for vegetables and increasingly for processing tomatoes. Farms here benefit from irrigation schemes fed by the Sinni and Agri rivers, but recent droughts have also strained this zone. In 2024, **severe water shortages** in the Metapontina made it "extremely difficult" to maintain spring–summer crops like tomatoes. Coldiretti reported that reservoir levels serving this area were down to ~20% of capacity, forcing cutbacks in vegetable transplanting and threatening the season's output. This zone's tomato growers (often medium-sized farms or cooperatives) need support to stabilize production – ensuring that water delivery is optimized and that growers can adapt planting schedules or varieties to the new climate reality. Stabilization measures here include improving water-use efficiency and possibly financial guarantees (e.g. insurance or disaster aid) so that farmers can confidently continue tomato cultivation despite increasing climate volatility.

Farm Types:

In both zones, tomato production tends to be more capital-intensive and market-oriented than other regional farming. Many growers cultivate tens of hectares and use mechanized harvesters (processing tomatoes are machine-picked) and contract with processing companies. These farms often employ seasonal labor for transplanting and other tasks, so stabilizing their operations also secures those seasonal jobs.

With limited public funds, **support should prioritize**: (a) farms that are **strategic for the supply chain** (e.g. those supplying local processing facilities or cooperatives), and (b) farms demonstrating commitment to water-saving practices (to ensure funds reward forward-looking behavior). By targeting aid to the Lavello and

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Metaponto clusters – which are Basilicata's tomato heartlands – the region can stabilize the bulk of its tomato output. This prevents a cascade of impacts: loss of raw material for processing factories, collapse of related employment, and reduced presence in the inter-regional tomato market. In summary, safeguarding these key zones through water and income support is essential to keep Basilicata's tomato sector afloat under climate stress.

Olive Production Areas and Farm Characteristics for Support

Olive cultivation in Basilicata is geographically extensive – olive groves blanket much of the region's hills and lower mountains, with three traditional districts of note: **Vulture (north Basilicata)**, the **Matera hills including Ferrandina (east/central)**, and the **Agri valley (southwest)**. Olive trees have been a cultural and economic mainstay here for centuries, and the region recently obtained an IGP for "Olio Lucano" (Basilicata EVOO) to promote its quality. However, the olive sector is highly vulnerable due to its structure and recent climate impacts:

- **Highly Fragmented Smallholdings:** Basilicata counts over **32,000 olive growers managing ~27,000 ha of groves**, meaning an average holding of <1 ha. These are mostly family-run, often part-time farms, many with traditional rain-fed orchards of local cultivars (e.g. *Ogliarola del Vulture*, *Majatica di Ferrandina*). Such small farms have limited financial buffers and irrigation infrastructure. They depend on stable yields to supplement their income, and the olives also sustain **140+ local oil mills** and a network of rural labor (for pruning, harvest, milling). When climate disaster strikes, these small producers are the hardest hit and least able to cope.

- **Climate "Ground Zero" in 2023–24:** The 2023/24 olive season was catastrophic. Prolonged drought and heatwaves caused many olive trees to desiccate; Basilicata's olive output was *"practically zero"* across most of the region. According to Oprol (the regional olive growers' association), olive oil production fell by **95%** compared to the previous year. *"We have already lost the entire olive production for the current season,"* reported the president of Oprol in August 2024. The few groves that still produced some olives were *"sporadic lucky islands in the northern part of the region"*, likely due to localized summer storms or slightly cooler microclimate. Most central and southern olive areas (including the Matera hills where the prized Majatica cultivar is grown) saw near-total crop failure. This situation qualifies as an agricultural calamity, and indeed local authorities and farm organizations have pressed for official disaster declarations.

Given this context, **stabilization support for olives** must be broad-based yet targeted: it should urgently assist the **worst-affected zones and farm types** to prevent irreversible damage (like orchard abandonment or farmers exiting the sector). Priority should go to:

- *Small, family-run olive farms in drought-stricken areas:* These include much of the **eastern and southern hills (Matera and Potenza provinces)** where 2024 yields were nil. Many growers here are older farmers or families for whom olives are a secondary but crucial income. Without support, they may abandon groves – resulting in lost income, loss of a cultural landscape, and increased erosion/desertification on unmanaged land. Stabilization can include direct payments or calamity aid to offset their income loss and help cover grove maintenance costs (pruning, etc.) so that trees survive to produce in the next season. It is noteworthy that some local olive varieties (e.g. Majatica) have shown sharply declining productivity in recent decades, potentially due to changing climate patterns. These areas might need not just financial relief but also agronomic assistance (e.g. advice on supplementary irrigation or changing cultivars – see next section on transitions).

- *Cooperative mills and grower groups:* While individual farms are small, many are organized in cooperatives or producer organizations for processing and marketing. Supporting these entities (for example, through grants or low-interest loans to keep olive mills operational despite low throughput) has a stabilization effect on the whole community. It prevents the collapse of processing capacity that would otherwise leave farmers with no outlet for their olives in future. As Oprol leaders have emphasized, strengthening **producer organizations and cooperatives** is vital for the olive sector's

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resilience and marketing. Thus, the plan should allocate some support to keep these groups afloat (e.g. helping cover fixed costs of mills in bad harvest years, or funding joint purchase of drought mitigation equipment).

- *Areas with strategic olive assets:* Even within the hard-hit regions, there are assets worth special protection – for instance, **ancient olive groves or specialty olive products**. Ferrandina's baked olive (made from the Majatica cultivar) is a Slow Food Presidium and part of Basilicata's heritage. Similarly, venerable olive groves with centuries-old trees (some protected by regional law) not only produce oil but also attract tourism and hold ecological value. Stabilization funds should ensure these cultural/ecological assets aren't lost to drought. This could mean emergency watering of heritage groves or extra payments to farmers who maintain old trees despite no crop (recognizing their service in preserving the landscape).

In summary, the **olive sector stabilization** will center on **emergency financial relief** for farmers (to compensate for climate-related losses and sustain their income), along with measures to keep the **olive value-chain functional** (avoiding permanent closure of mills or loss of market access). By targeting smallholders and key olive zones (like Vulture, Collina Materana, Val d'Agri), Basilicata can cushion the shock of recent droughts. This not only supports farm incomes directly but also buys time for longer-term adaptation measures to take effect in subsequent years. Without such stabilization, there is a high risk of widespread grove abandonment and rural job losses, given that *"the Lucanian olive sector is made up of family enterprises tied to the territory"* and cannot easily absorb consecutive bad years. The next section will discuss how to transition these zones to greater resilience, but **first and foremost comes stabilization**: keeping farmers on the land and trees alive in the face of climate adversity.

Transitioning to Resilient and Diversified Systems

While short-term stabilization is critical, the **long-term viability** of Basilicata's tomato and olive sectors depends on proactive adaptation and diversification. Climate models project that southern Italy will continue to face rising temperatures, more erratic rainfall, and increased frequency of drought years. Public funds are limited, so simply compensating losses year after year is not sustainable. Instead, this plan promotes a **transition to farming systems that are more resilient** to climate stress and that diversify farm incomes. This includes technological upgrades, shifts in crop mix or practices, and innovative projects that reduce reliance on climate-sensitive yields. Below, we outline transition strategies for tomatoes and olives, as well as integrated measures that benefit both.

Resilience Strategies for Tomato Cultivation

For tomatoes, building resilience revolves around **water management, heat adaptation, and crop diversification** within the farming system:

- **Improved Irrigation Efficiency and Water Storage:** Given that water scarcity is the Achilles' heel for tomatoes, a top priority is to use every drop effectively. Many Basilicata tomato farms already use drip irrigation, but there is room to optimize timing and reduce losses. The plan will support the adoption of **advanced irrigation management tools** – e.g. soil moisture sensors and automated drip scheduling – which have shown promise locally. In 2022, for instance, some Basilicata farms used weather stations and sensors (monitoring soil moisture, temperature, humidity) to guide irrigation, and this helped sustain good yields despite heatwaves. We will expand such Decision Support Systems (DSS) to all major tomato growers by 2026. Additionally, small-scale on-farm water storage will be promoted: farmers can receive grants to build or expand **rainwater catchment basins or reservoirs** to capture winter rains for summer use. Even a pond that provides one or two additional irrigations in late July can be crop-saving in a drought year. At the collective level, the plan coordinates with ongoing infrastructure projects – notably the **Rendina reservoir rehabilitation** funded by the PNRR. The Rendina dam, once repaired, will restore an important water source for northern Basilicata; our timeline aims for this to come online by around 2028 (given that funds have been allocated but *"it will take years"* to complete). To supplement this, we will explore emergency agreements with neighboring regions for water sharing in drought years (building on the 2024 attempt to exchange

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water with Apulia's aqueduct system). In essence, **securing water** through efficiency and new storage is foundational for tomato resilience.

- **Heat-Tolerant Varieties and Adjusted Planting Schedules:** As summers become hotter, the plan encourages a shift to tomato varieties and farming schedules that can better handle heat. Early-planted tomatoes (transplanted in April) in 2024 fared comparatively better – they matured before the worst of the heat, and their robust foliage provided some fruit protection. We will work with seed companies and local research centers to identify or breed **varieties with greater heat/drought tolerance** (e.g. those with strong leaf cover, deeper roots, or heat-set ability for flowers). Farmers will receive technical guidance and possibly incentives (such as free trial seeds or seed purchase subsidies) to adopt these varieties. Additionally, staggering the planting dates to avoid having all fields in the sensitive flowering stage during peak heat can spread the risk. For example, some acreage can be planted very early (with frost protection measures if needed), and some perhaps later with fast-maturing cultivars that ripen in early September rather than August. Experimentation in planting calendars will be supported through pilot trials in 2025–26.

- **Protected Cultivation and Crop Rotation:** To diversify risk, tomato growers should not rely solely on open-field summer crops. The plan will introduce **protected cultivation** options – such as mid-season tomato or high-value vegetable production under shade nets or in tunnels – to mitigate weather extremes. Simple shade netting over tomato fields can lower canopy temperatures and reduce sunscald on fruits; this has been used successfully by some producers (e.g. using **kaolin clay sprays** for a similar purpose, which an olive farmer used to prevent fruit "sunburn" and could be adapted to tomatoes as well). Funding will be available for shade cloths or reflective mulches that reduce heat stress on tomato plants. In addition, crop rotation will be emphasized: rather than monocropping tomatoes every year on the same land (which can exacerbate pest/disease and soil moisture depletion issues), farmers will be encouraged to rotate with less water-demanding or earlier-season crops. For instance, a **tomato–cereal/legume rotation** can allow winter rainfall to recharge soil for the next tomato crop, and a legume cover crop can improve soil moisture retention and fertility. Winter or spring crops (like pulses, or horticultural crops harvested by June) could provide income in years when water is too scarce to plant a full tomato crop in summer. The plan's diversification grants (detailed in the Activities section) will support farmers who adopt such rotations or add a secondary crop, thereby reducing their financial dependence on one climate-sensitive harvest.

- **Risk Management Tools (Insurance/Mutual Funds):** To support farm incomes under increasing climate volatility, we will bolster the use of **crop insurance and mutual risk-sharing schemes** for tomatoes. Currently, not all tomato farmers insure their crops for drought or heat damage. Under this plan, the Basilicata Region will subsidize insurance premiums (for example, covering 50% of the cost) for policies that protect against yield loss from weather extremes. This leverages EU Rural Development funds (Measure 17) to encourage uptake of index insurance or multi-peril crop insurance. Moreover, we aim to establish an **Income Stabilization Tool (IST)** specifically for horticulture, as allowed under the CAP: essentially a mutual fund where farmers contribute in good years and can receive payouts when their income drops beyond a certain threshold due to climate shocks. With initial public co-financing to set it up, such a tool can provide a safety net without requiring full compensation from the public budget every time. By 2030, our goal is that a majority of tomato producers participate in either insurance or the IST, creating a more resilient financial base for the sector.

Through these measures – smarter water use, heat adaptation, diversified cropping, and financial risk buffers – the tomato sector can better withstand the next drought or heatwave. The overall strategy is to **produce "more crop per drop" of water** and to avoid complete crop failures that devastate incomes. It's worth noting that some of these adaptations (like efficient irrigation, rotations, precision agriculture) also have environmental co-benefits, such as conserving water and soils, aligning with the EU's sustainable agriculture goals.

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Resilience and Diversification in Olive Farming Systems

For olives, resilience means helping this traditional sector adapt to a hotter, drier climate while also diversifying the income sources of olive-growing communities. Key transition strategies include:

- **Supplemental Irrigation and Water Conservation:** Traditionally, most olive groves in Basilicata are rain-fed. Olives are drought-tolerant relative to other fruit trees, but the extreme droughts of recent years reveal the limits of that tolerance – yields collapse when rainfall is far below normal. To prevent total crop losses in dry years, the plan will facilitate **targeted supplemental irrigation** for olives. This does not imply converting all groves to intensive irrigation, which would be infeasible given water scarcity. Instead, we focus on *"lifeline" irrigation*: providing minimal but strategic water applications to keep trees alive and productive through severe drought. For example, supplying **1–2 irrigations (100–200 m³/ha each)** during critical stress periods (late spring or summer) can significantly improve fruit set and reduce tree stress. We will identify priority areas for such support – e.g. cooperative olive farms or young high-density groves that can benefit most from irrigation. Where infrastructure is nearby (say, an existing aqueduct or farm pond), small grants can help farmers purchase and lay out drip lines in olive orchards. In more remote groves, the plan could support community-level solutions like **mobile water tanks or community wells**. Concurrently, **water conservation in orchards** will be promoted: mulching and cover-cropping in olive groves to reduce soil evaporation, and pruning techniques that balance yields with water stress. Notably, many Basilicata olive growers have begun keeping a grass cover in the grove year-round; when mowed and left as mulch, this grass cover helps retain soil moisture. The plan's agronomic advisors will train farmers in these practices (and our support programs may even require them as conditions for receiving aid, to ensure best practices spread).

- **Climate-Resilient Cultivars and Orchard Renewal:** As part of adapting the olive sector, we must confront the fact that some traditional cultivars (like *Majatica*) are not fruiting reliably under new climate patterns. Thus, a **replanting and grafting program** will be launched. This program has two branches: (a) **Conservation and breeding** – working with the University of Basilicata and olive research institutes to select or breed olive varieties better suited to future conditions (drought-resistant, heat-resistant, and hopefully pest-resistant as well). For example, varieties from arid parts of the Mediterranean or new genotypes might be introduced on a trial basis in Basilicata's groves. And (b) **Orchard renewal incentives** – farmers with senescent, unproductive, or climate-stressed olive trees will be offered support either to **rejuvenate the grove** (e.g. top-working old trees with new cultivar scions, as allowed under regional law) or to **replant** a portion of their farm with a mix of olive varieties that spread risk. The new regional olive law (enacted 2015) already streamlined procedures for replacing non-productive trees; we will build on this by covering part of the costs for certified seedlings, grafting materials, and planting. Priority will be given to maintaining local genetic heritage *where possible* – for instance, by selecting improved clones of local varieties – but the overriding goal is to **ensure the grove produces some harvest even in hot dry years**. By 2030, we aim to have several thousand new olive trees planted in the most suitable micro-zones (e.g. in northern Basilicata where conditions are a bit more favorable, as Oprol suggested expanding area in specific vocated zones), and older groves in marginal areas either diversified or managed in a new way (see next points).

- **Agroforestry and Crop Diversification in Olive Lands:** Many of Basilicata's olive groves are in **marginal upland areas** that were already at risk of abandonment even before the recent droughts. To keep these areas economically viable, the plan encourages introducing **complementary crops or uses** into the olive farming system – essentially creating an agroforestry or mixed farming approach. One promising avenue is the cultivation of **saffron (Crocus sativus)** and other high-value medicinal plants in olive orchards or on small terraces nearby. Research has identified Basilicata's inland areas as highly suitable for saffron, with over 31,000 ha potentially available for this crop without displacing major existing uses. Saffron is dubbed "red gold" for its price; it offers *"high profitability"* even on small plots and can supplement farm income significantly. Our plan will help 50–100 interested olive farming families pilot saffron cultivation on unused corners of their land (using innovative low-cost

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methods like **"tuff tubs"** for raised-bed saffron as demonstrated in a recent Basilicata experiment). This aligns with EU trends to revitalize inner areas through niche products. Likewise, **beekeeping** can be integrated: we'll provide training and starter kits for olive farmers to keep bees in their groves, producing honey (which diversifies income and improves pollination for any intercropped plants). Some farmers may opt to diversify into **alternative tree crops** on part of their land – for instance, planting drought-hardy **almond or pistachio** trees alongside olives, or figs and pomegranates, which can handle heat and have market value. The plan's diversification grants (Measure 6 of the Rural Development Program) will co-finance such plantings or related equipment. Overall, the idea is to ensure that even if one crop fails (e.g. olives in a bad year), the farm has another source of revenue to fall back on. This reduces the incentive to abandon agriculture altogether.

- **Value-Added Processing and Agritourism:** Another aspect of diversification is moving up the value chain and tapping into tourism. Basilicata's olive oil is already of high quality (now protected under IGP "Olio Lucano"), but farmers often sell bulk oil at low prices. By supporting **local processing and branding**, we can increase farm revenues per unit of olive produced. For example, cooperatives will receive assistance to market branded extra-virgin oil from specific sub-regions (building on the IGP) or to develop specialty products like flavored oils, olive pâtés, or the traditional *olive di Ferrandina al forno* (baked olives) which is a local delicacy. These commands premium prices and can make the olive business more profitable even if volume is down. Similarly, promoting **olive-related agritourism** can create new income: agritourism farms that offer olive grove tours, olive oil tastings, or harvest experiences could tap into Basilicata's growing tourism appeal (Matera's UNESCO status, etc.). The plan will work with the tourism board to create olive tourism itineraries and provide small grants for farm stays or olive museums (some municipalities like Ferrandina have started this with an olive oil museum). Such activities generate service-sector jobs and cushion farming families with an additional revenue stream less dependent on weather.

- **Pest and Disease Resilience:** Climate change also tends to worsen pest pressures (for instance, the olive fruit fly and fungal diseases in olives). The extreme heat in 2023-24 actually reduced the olive fly incidence (flies struggle in very high heat), but other issues like olive quick decline syndrome (*Xylella fastidiosa* disease) loom on the horizon from neighboring Puglia. As part of resilient practices, the plan will intensify **monitoring and preventive measures** against such threats. This includes continued vigilance to keep Basilicata Xylella-free (tight controls on plant material movement, surveillance in groves), and promotion of integrated pest management to handle pests like olive fly or olive moth in hotter conditions. Adaptations like the earlier-mentioned **kaolin clay spray** not only shield olives from sunburn but also act as a repellant to olive fruit flies – a win-win adaptation that some Tuscan farms have found useful. We will test and disseminate these methods in Basilicata. Keeping trees healthy and pest-free improves their resilience to climate stress as well.

In combination, these strategies aim to transform Basilicata's olive sector from one highly vulnerable to drought into one that is **more buffered and innovative**. By 2030, an olive farm in Basilicata might have a few irrigated rows of a resilient olive cultivar, a beehive under the shade of the trees, a patch of saffron or herbs on the side, and a farm shop selling branded oil and local products to visitors. Such a farm would have multiple income streams and better ability to cope with a bad olive harvest year. Importantly, these changes will be pursued while **preserving the character of the landscape** – maintaining olive trees on the hills (rather than replacing them wholesale) to protect soil and biodiversity, in line with the region's goal of sustainable land management. In fact, sustainable olive cultivation with cover crops can help combat land degradation and desertification risk in Basilicata's dry areas. Thus, resilience and environmental stewardship go hand in hand.

Innovative Cross-Cutting Initiatives

Finally, the plan includes a couple of **innovative, cross-cutting initiatives** that simultaneously benefit both tomato and olive sectors (and agriculture broadly) under climate constraints:

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- **Agrivoltaics and Renewable Energy on Farms:** To address climate challenges and high energy costs, Basilicata will pilot **agrivoltaic systems** – the integration of solar panels with agriculture. Given the region's abundant sunshine, solar panels can generate electricity to power irrigation pumps or processing equipment, and if designed properly (e.g. elevated panels), they can also provide partial shading to crops. We propose two pilot projects by 2026: one in a tomato field and one in an olive grove. In the tomato field pilot (perhaps 5–10 hectares in the Metapontino), adjustable solar panel arrays could be installed above the crop rows, allowing sufficient light for tomatoes but cutting peak sun intensity, thus reducing crop heat stress and evaporation. In an olive grove, solar panels could be placed in gaps or as carport structures at the farm, generating income for the farmer through energy sales or savings. The PNRR and national renewable energy incentives (such as the *Parco Agrisolare* program) can fund a large share of these investments. The expected benefits are twofold: **economic** (farms get an extra revenue source or cheaper electricity, improving income stability) and **climatic** (the slight shading can improve soil moisture retention and reduce plant stress, as well as contributing to mitigation via clean energy). If the pilots show success, we will create guidelines and financial instruments for scaling agrivoltaics to more farms by 2028–2030. This is a prime example of leveraging private investment (energy companies or cooperatives) to assist agriculture, thus easing public budget pressure.

- **Regional Climate Advisory Service and Training:** Knowledge is a key asset for resilience. The plan will establish a *Climate-Smart Agriculture Advisory Service* under ALSIA (the regional agricultural development agency) to provide farmers with real-time guidance and training. This service will include seasonal climate forecasting tailored to farmers (e.g. if a dry season is anticipated, advise early harvest of certain crops or additional irrigation scheduling), workshops on drought adaptation techniques, and one-on-one farm assessments. By 2025, a team of agronomists will be trained in the latest climate adaptation practices (some gleaned from EU research projects like LIFE AgroClimaWater, in which a Basilicata farmers' organization participated to improve water efficiency). They will then conduct outreach across Basilicata's rural communities – organizing field days to demonstrate new irrigation tech, teaching olive growers how to apply antitranspirants or mulch, guiding tomato cooperatives in setting up insurance schemes, etc. Empowering farmers with know-how ensures that the hardware investments (drip systems, new varieties, etc.) are used to full effect. It also encourages peer learning; for example, a farmer who successfully maintained yields using a new technique can mentor others in the area. While this advisory effort has a modest cost, the benefit is high: it increases adoption rates of all the aforementioned resilient practices, essentially multiplying the return on investment of physical measures.

By pursuing these transitions in tandem with stabilization, Basilicata will gradually shift its agriculture onto a more sustainable and secure footing. The timeline in the next section will show how immediate actions (2025–26) blend into these longer-term changes up to 2030.

Implementation Timeline (2025–2030)

The rollout of this plan is phased to address urgent needs first, then progressively build adaptive capacity. The timeline below outlines the major milestones and actions by year:

Year **Key Initiatives and Milestones**

2025 **Emergency Relief and Planning:** Roll out immediate disaster relief for 2024 losses – e.g. calamity compensation to olive growers (via national Solidarity Fund) and emergency irrigation efforts for tomato fields. Initiate the Climate Advisory Service and train agronomists in resilience practices. Launch pilot programs: e.g. 10 demo farms (5 tomato, 5 olive) receive sensor-equipped irrigation systems and serve as showcases. Establish a multi-stakeholder Task Force (regional officials, farm organizations, scientists) to coordinate the plan's implementation and monitor climate forecasts for proactive actions.

2026 **Infrastructure and Pilot Projects:** Begin on-the-ground construction/upgrades – repair irrigation canals, drill community wells in olive villages, and break ground on the Rendina dam refurbishment (target completion ~2028). Deploy the agrivoltaic pilots: solar arrays installed by mid-2026 on selected farms. Introduce insurance subsidy scheme for tomatoes in the spring planting season; aim for at least 50% of tomato acreage insured this year. Distribute grants for on-farm water reservoirs and complete 20 farm ponds before summer. Saffron diversification program starts in autumn 2026 with the first group of farmers planting saffron corms in olive groves.

2027 **Scale-Up of Resilience Measures:** Evaluate results from 2025–26 pilots and scale successful practices. By spring 2027, expand precision irrigation kits to 500 ha of tomatoes and 1,000 ha of olive groves (targeting cooperative members). Enroll additional

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farmers in crop insurance and the new Income Stabilization mutual fund (with regional co-finance for the fund's reserve). Launch a **Resilient Olive Orchard** grant program – supporting grafting/replanting on at least 100 ha of olive groves with climate-hardy varieties. Also in this year, roll out training sessions in every major farming area: e.g. water management workshops in Metaponto and Lavello, and agroforestry workshops in inner mountain communities. This year is also when CAP funding mid-term is assessed – the Task Force will adjust financial allocations if needed to ensure all priority projects are on track.

2028 **Mid-Term Review and Infrastructure Completion:** Key large projects near fruition: the renovated Rendina dam and irrigation network improvements are expected to be operational by late 2028, boosting water supply for ~3,000 ha in the Vulture-Lavello area. Conduct a **mid-term review** of the plan's effectiveness with stakeholders. By now, the aim is that tomato yields have stabilized above drought-year lows (no repeat of the extreme 2024 loss) and olive production has recovered from zero to at least a moderate harvest, thanks to better water and farm practices. Adjust targets if climate conditions have deviated significantly. Expand the replanting program if uptake is strong – possibly seek additional funds for more orchards. The agrivoltaic pilot results are published and promoted; if positive, initiate planning for a larger 50 ha agrivoltaic park in collaboration with private investors (to be implemented in 2029–30).

2029 **Consolidation and Expansion:** By 2029, most adaptation measures are fully deployed. This year focuses on **consolidation**: ensuring new systems (irrigation tech, insurance schemes, cooperatives) are running self-sufficiently. The region will push for any remaining farmers who have not adopted key practices (like drip irrigation or cover cropping) to join – possibly making certain supports (e.g. CAP eco-scheme payments) contingent on these practices to boost compliance. A second round of diversification projects is launched, informed by lessons – e.g. if saffron proved successful, recruit more farmers and link them with markets; if other niche crops or agritourism ideas emerged, provide mini-grants to develop those. Meanwhile, monitor climate data: 2029 might be an "off-year" for olives by biological cycle; ensure that even in an off-year, with our interventions, production doesn't collapse entirely.

2030 **Evaluation and Future Planning:** The final year of this plan period will involve a comprehensive evaluation against targets: climate resilience metrics (e.g. reduction in yield variance, water use efficiency gains), economic metrics (farm income trends, jobs maintained/created), and environmental metrics (soil/water indicators). By end of 2030, the region will compile a **Climate-Resilient Agriculture Report** documenting outcomes. This will feed into the planning for the next CAP cycle (post-2030) and any longer-term strategies. The expectation is that by 2030, Basilicata's tomato and olive sectors are not only surviving but set up to thrive in the new climate reality – with stabilized production, diversified farm businesses, and robust support networks. If any gaps remain, they will be identified for continuous improvement beyond 2030.

This timeline ensures an orderly progression from urgent action to sustainable transformation. Early wins (like emergency drought relief and initial pilots) build momentum and buy goodwill from the farming community, which is crucial for cooperation. The mid-term review in 2028 provides an opportunity to recalibrate, acknowledge successes (e.g. increased yields, successful adoption rates) and address any shortcomings while funding is still available. The timeline also dovetails with external milestones: many investments coincide with the **EU funding cycle** (CAP 2023–27 mid-term and end, as well as PNRR projects concluding by 2026–27), and by 2030 Basilicata should be well-positioned to leverage whatever new national/EU programs exist for the next phase of climate adaptation.

Key Actions, Estimated Costs, and Expected Benefits

The table below summarizes the main actions in this plan, along with rough cost estimates and anticipated benefits. Costs are estimated with current knowledge and would be refined in detailed project design; they assume co-financing from regional, national, and EU sources as noted in the Funding section. Benefits are expressed in terms of both quantifiable outputs and qualitative impacts on resilience, income, and employment.

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Table 1.
Stabilization and Adaptation Measures for Tomato Sector in Basilicata (2025–2030)

Action (Tomatoes)	Timeframe	Est. Public Cost	Expected Benefits
Emergency Irrigation Support – Trucking water or temporary pumps to save 3,000 ha in Lavello plain during acute drought. *Also includes compensation for 2024 yield losses.*	2025 (immediate)	€2 million (regional emergency funds + national)	Prevents total crop failure on 3,000 ha, averting ~€10 million of farmer revenue loss; maintains supply to processing plants, protecting related jobs; keeps farmers solvent so they can plant next season.
Irrigation Infrastructure Upgrade – Complete Rendina dam repair and canal improvements; enhance Metaponto irrigation network (lining canals, fixing leaks).	2025–2028	€15 million (PNRR + Regional)	Increases available irrigation water by **+5–10 Mm³/year** in northern Basilicata once online; enables full irrigation of 3,000 ha in dry years, boosting tomato yields by ~30% in those years. Long-term benefit: stabilizes an industry worth €50 million/yr in output and its processing chain.
On-Farm Water Efficiency Package – 50% cost-share grants for drip system upgrades, moisture sensors, and DSS apps on ~2,000 ha of tomatoes.	2025–2027	€2.5 million (CAP Rural Dev.)	Saves water (20–25% less used per ha) while maintaining yields; approximately **5 Mm³/year** water saved across 2,000 ha. Expected yield stability: fewer losses in moderate drought, perhaps +10% yield in dry years due to optimal scheduling. Improves farm profitability (€100–200/ha net gain via saved water and inputs).
Heat-Resilient Varieties Program – Field trials and seed subsidies for heat-tolerant tomato varieties on 500 ha; includes shade nets in worst-hit fields.	2025–2028	€0.8 million (CAP + private seed industry)	Identifies 2–3 varieties with >10% higher fruit set under heat; yields on participating farms remain higher in heatwave conditions (reducing losses by ~€1,000/ha in bad years). Broader adoption post-trial could protect a large share of the crop from extreme heat.
Crop Insurance & Mutual Fund – Premium subsidy (50%) for drought insurance on tomato crop; seed funding for an Income Stabilization Tool covering tomato farmers.	2025–2030 (annual)	€0.5 million/yr (CAP risk mgmt.)	Achieves ~70% insurance coverage in tomato sector by 2030. Farmers get payouts in disaster years (covering up to 70% of income loss), greatly smoothing incomes. Reduces need for ad-hoc government bailouts. The mutual fund could accumulate ~€3 M by 2030, creating a self-reliant safety net.

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Table 2.
Stabilization and Adaptation Measures for Olive Sector in Basilicata (2025–2030)

Action (Olives)	Timeframe	Est. Public Cost	Expected Benefits
Disaster Relief for Olive Growers – Calamity payments for 2023–24 losses and future extreme events; covers a portion of lost income for ~30,000 small farmers.	2025–2030 (as needed)	€5 million (National Solidarity Fund)	Immediate economic relief: ~€1,000 per farmer on average in 2024, helping families cover costs. Prevents abandonment of >5,000 ha of groves that might otherwise be left untended. Preserves rural purchasing power (mitigating knock-on job losses in local communities).
Community Micro-Irrigation Scheme – Equip priority olive cooperatives (covering ~5,000 trees) with shallow wells or shared water tanks and drip lines for supplemental watering.	2025–2026 (pilot) 2027–2029 (expand)	€1 million (Regional + CAP)	Even **1–2 waterings** in summer can boost fruit retention significantly – pilots expect a 20–30% yield increase in treated groves during drought years. Saves high-value trees from death in extreme drought. If scaled to 1,000 ha (roughly 5% of olive area), could safeguard ~200 tons of oil output in a bad year (worth €1 M), protecting milling jobs.
Resilient Grove Renewal – Grants for replanting or grafting olive trees (drought-tolerant varieties) on ~200 ha; includes nursery support to propagate local hardy cultivars.	2026 (start) through 2030	€3 million (CAP Rural Dev. + Nat'l)	Revitalizes olive production in targeted areas: expected oil yield +50% on rejuvenated groves within 5 years. Introduces new genetics to 50–100 groves, improving long-term resilience. Also short-term employment boost: local workers hired for planting and grafting (estimated 5,000 person-days of work created).
Soil & Orchard Management Incentives – Payments for implementing cover crops, mulching, and integrated pest management in olive groves (e.g. an eco-scheme under CAP on 5,000 ha).	2025–2030 (annual)	€0.3 million/yr (CAP Eco-scheme)	Improves soil moisture and health on a quarter of region's olive lands. Likely reduces tree stress (fewer premature fruit drops) and could raise yield stability (yield variation down by ~15%). Environmental co-benefits: reduced erosion and better carbon sequestration in soils. Also training ~1000 farmers in modern IPM keeps olive fly/pest damage low even as climate shifts.
Diversification Projects (Olive Areas) – Support 100 farms in inner areas to add new income sources: saffron cultivation (with materials for 0.1 ha each), beekeeping kits, agritourism site upgrades, etc.	2025–2027 (pilot 50 farms) 2028–2030 (next 50 farms)	€1 million (CAP Rural Dev. + Regional)	By project end, ~100 olive-farming families gain an extra revenue stream. For example, saffron: each 0.1 ha can yield ~300–500 g of saffron, worth €6,000–€10,000, significantly boosting household income. Beekeeping: each farm produces honey or wax products adding a few thousand euros income. Collectively, these micro-enterprises create seasonal jobs (harvesting saffron, hosting tourists) and make youth more interested in staying in farming.
Marketing & Cooperative Support – One-time grants to olive oil cooperatives for branding, quality certification, and mill upgrades; plus operating support to keep mills open in low-yield years.	2025–2028	€2 million (Regional + EU quality funds)	Helps 10–15 coops invest in better equipment (improving oil extraction efficiency by 5% and quality to extra-virgin standards). Develops Basilicata's collective brand – by 2030, aim for 50% of oil marketed under IGP Lucano or DOP labels, fetching ~10–15% higher prices for farmers. Crucially, maintains processing capacity: no mills shut down despite the 2024 crisis (protecting ~300 mill worker jobs and services). The improved marketing and prices increase farmers' income stability and reward quality production.

Note: Cost figures are approximate and assume coordination of multiple funding sources. "CAP" refers to EU Common Agricultural Policy funds (e.g. rural development measures, eco-schemes, etc.), and "Regional" refers to the Basilicata regional government's budget or EU structural funds under its management.

These actions illustrate a mix of **hard investments** (infrastructure, equipment) and **soft investments** (training, organization, insurance). The expected benefits are similarly multifaceted – from tangible increases in yields and water savings to intangible but important outcomes like greater farmer confidence and cooperative vitality. It's important to emphasize that many of these benefits reinforce each other: for instance, better irrigation infrastructure not only raises yields but also reduces the variability that necessitates large disaster payments; diversified farm income reduces pressure on the public purse for future crises, etc. Overall, the package is designed to be **cost-effective**, focusing on interventions that yield high returns in resilience per euro spent.

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Funding Sources and Financing Plan

Implementing this hybrid strategy will require tapping a combination of **public and private funding sources**. Below we outline how each component of the plan is financed, ensuring that limited public funds are used strategically and leveraged to attract additional investment:

- **European Union Funds (CAP 2023–27 & 2028–34):** Basilicata will harness both Pillar I and Pillar II of the Common Agricultural Policy. Under Pillar I, Italy has coupled income support for processing tomatoes (estimated ~€173/ha for eligible tomato fields under contract) – this provides baseline income to tomato growers and will continue. More importantly, Pillar II (Rural Development Program) is the engine for many plan measures. Basilicata's RDP (Complemento Sviluppo Rurale) already includes measures that align with our plan, such as **Measure 4** (Investments in physical assets) for irrigation systems and farm equipment, **Measure 5** (Restoring agricultural production potential) for disaster-affected groves, **Measure 6** (Farm diversification) for agritourism/saffron, **Measure 8** (Afforestation/land management – could be tapped for agroforestry), **Measure 10** (Agri-environment-climate) for cover cropping and IPM in olives, and **Measure 17** (Risk management) for insurance support. We will reallocate and prioritize RDP funds toward the actions listed (subject to Managing Authority approvals). For instance, a significant share of Measure 4 budget will be dedicated to water-saving irrigation tech and olive replanting. The eco-scheme under the new CAP (2023–27) can be tailored to include an olive grove cover crop option, paying farmers for that practice as noted. Additionally, Basilicata can seek additional EU support via programs like **LIFE and Horizon Europe** for specific innovation pilots (e.g. agrivoltaics, climate-smart farming research). The LIFE AgroClimaWater project previously included Basilicata's Metapontino in water adaptation efforts – building on such experiences, the region could lead or join a new proposal for LIFE funding focused on drought resilience in Mediterranean farming, which would bring extra resources for demonstration projects.

- **National Funding (Italy's Government and Recovery Plan):** On the national level, two major sources are tapped: the **Fondo di Solidarietà Nazionale (FSN)** for agricultural disasters, and the **PNRR (Piano Nazionale di Ripresa e Resilienza)** funds for strategic investments. The FSN will cover the calamity aid for olive farmers and any emergency compensation for tomatoes, as those are classic uses of that fund. We will ensure Basilicata promptly declares states of calamity for events like the 2023–24 drought (Oprol has already urged this) so that FSN money is unlocked. Meanwhile, PNRR investments are already in motion for water infrastructure – e.g. **PNRR Mission "Infrastructure for Sustainable Water"** allocated funds to refurbish the Rendina dam, and possibly other irrigation works in southern Italy. Basilicata will coordinate with national authorities to expedite these and to propose new projects (such as digitization of irrigation networks) for any PNRR follow-up funds. The agrivoltaic pilots and farm solar initiatives can draw on the PNRR's renewable energy and agrisolar funding lines – Italy earmarked funds for on-farm solar panel installation (Parco Agrisolare) which Basilicata can utilize for cooperative mills and greenhouse/packhouse roofs, etc. Additionally, Basilicata might leverage the national **"Contratti di Filiera"** program – a supply chain contract scheme – by presenting a project that links tomato and olive processing improvements with farmer support, thereby getting co-financing from the Ministry of Agriculture for those value-chain activities.

- **Regional Budget and Cofinancing:** The Basilicata Region will allocate part of its budget (including EU structural funds under the Regional Operational Program) to co-finance the CAP rural development measures (usually around 30-40% match for EU funds) and to fund region-specific initiatives not covered elsewhere. For example, the Climate Advisory Service and training programs may rely on a mix of EAFRD technical assistance money and regional funds. Basilicata might also enact its own small grant schemes – as it did with the 2015 olive law which had provisions for funding olive sector promotion – for instance, a regional grant for cooperative marketing or for agritourism development (potentially tapping the regional tourism fund). While Basilicata is not a wealthy region, it can prioritize agriculture in budget planning given the sector's importance to employment and land management.

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- **Private Sector and Farmer Contributions:** A cornerstone of this plan is that it **mobilizes private investment** alongside public. Farmers themselves will invest in their own resilience – through matching contributions to grants (often RDP grants are 40-70% public, with farmers covering the rest), through participation in mutual funds (farmer premiums building the fund), and through adopting new crops and enterprises (which requires labor and capital from their side). The plan's design, by improving profitability, aims to give farmers the confidence to invest. For example, tomato processors and large agri-businesses have a stake in stable production; we anticipate that processing companies (or producer organizations) may chip in to projects like the water efficiency drive – much like how some factories have provided drip irrigation kits or agronomic expertise to their growers in other regions. We will actively engage the processing industry in Basilicata and neighboring regions to form **public-private partnerships**: e.g. a tomato processor might fund part of a weather station network that benefits its supplier farms, or an olive oil buyer might support a quality upgrade program. There is also potential to involve banks and impact investors: local banks can offer climate adaptation loans (with partial credit guarantees from the regional government to reduce risk), encouraging farmers to invest now for future resilience. Impact investors or social enterprises might be interested in funding agrivoltaic expansions or carbon-sequestration via olive groves, in return for carbon credits or green branding. By creating a clear strategy, Basilicata can attract such innovative financing.

- **Community and Cooperative Funds:** Finally, the cooperative movement within the region can be a source of funds and implementation capacity. Many olive oil cooperatives and farmer groups accumulate some capital from member contributions or past profits. The plan encourages them to re-invest those funds into adaptation projects – e.g. a cooperative could invest in a new well or reservoir for its members, with the plan matching that investment. Also, if olive oil prices rebound due to scarcity, cooperatives might allocate a portion of windfall profits to a reserve for future bad years (essentially a self-managed stabilization fund). The region will facilitate and recognize such initiatives, perhaps via a formal **"Resilience Charter"** with cooperatives agreeing to certain self-help measures in exchange for public support.

By weaving together these funding streams, we ensure no single source is overburdened. EU funds cover much of the planned investments and farmer payments, national funds cover the extraordinary disaster shocks and large infrastructure, and local/private contributions fill in gaps and ensure buy-in. Notably, many actions (like improved practices) are low-cost and more about knowledge than money, which is advantageous under budget constraints. The plan also emphasizes **cost-sharing** – for example, the insurance scheme splits cost between government and farmers, maximizing leverage of public euros.

To illustrate the leverage: for roughly €15–20 million of public investment over 6 years (the sum of the costs outlined in the tables), we expect on the order of €30–40 million in total investment when including private co-funding. This is a reasonable scale given Basilicata's rural development allocations and additional support mobilized via PNRR and FSN. It's also modest compared to the potential cost of inaction: a single bad year like 2024 can cause tens of millions in lost output and require large emergency aid injections anyway. Thus, the financing plan is **preventative and productive spending** rather than reactive and consumptive spending.

Employment and Income Stability Impacts

One of the core goals of this hybrid strategy is to support regional employment and stabilize farm incomes. The measures described will have the following positive impacts on jobs and income in Basilicata's agricultural sector:

- **Preservation of Existing Jobs:** By stabilizing tomato and olive production, the plan safeguards the jobs that already exist in these supply chains. In the tomato sector, this includes on-farm labor (each 100 hectares of processing tomato supports numerous seasonal jobs for transplanting, field maintenance, and harvest operations) and **factory jobs** in tomato processing. Basilicata, together with neighboring regions, has processing facilities that depend on the regional tomato supply; preventing a

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collapse in tomato acreage ensures these plants continue to operate at viable capacity. For example, avoiding the worst-case yield losses in 2024 meant producers could still supply factories, thereby securing the employment of workers in those facilities and related transport/logistics roles. In the olive sector, the plan keeps **140+ olive mills** running. Had the olive production completely failed for multiple years, many of these small mills (each of which employs millers, technicians, drivers, etc.) would close. We estimate that maintaining even a minimal olive harvest (with improved water and practices) has kept *hundreds of seasonal harvesting jobs* and dozens of mill jobs from disappearing in 2024, and the plan will multiply that effect going forward. In addition, the broader rural service economy (pruners, input suppliers, mechanics) retains business as farmers stay active – an intangible but real job preservation impact.

- **Creation of New Employment Opportunities:** The transition elements of the plan actively create jobs. Diversification into saffron, for instance, is labor-intensive (saffron picking and processing requires significant hand labor in October–November). For each hectare of saffron introduced, there may be several seasonal jobs for rural women or youth, as saffron picking is often done by hand in family or community groups. Our plan's target of ~10 hectares of saffron (cumulatively across many small plots) could generate seasonal work for on the order of 100 people during harvest weeks, injecting income into communities. Agritourism developments will create hospitality jobs – if even 10 olive farms add agritourism lodging or tasting tours, that could employ 10–20 people in guest services, guiding, and direct sales. The agrivoltaic initiative, while primarily an energy project, also brings construction and maintenance jobs (solar panel installation and upkeep crews). Importantly, many of these new jobs can attract **young people and skilled workers** back to the rural areas, addressing the chronic issue of youth outmigration. When farms adopt modern technology (sensors, drones, solar panels), they often engage young tech-savvy workers or consultants, thus modernizing the employment profile of the sector. By 2030, we expect a more diversified rural economy with roles ranging from traditional farm labor to high-tech farm management and tourism entrepreneurship.

- **Supporting Farm Income and Reducing Volatility:** At the heart of income stability is the reduction of extreme troughs in earnings. The combination of yield stabilization and financial instruments in this plan means farmers should no longer face near-zero income years. For example, olive farmers who saw no crop (and hence no revenue) in 2024 will, under this plan, at least receive an indemnity or insurance payout and potentially harvest something thanks to supplemental irrigation. Tomato growers will similarly avoid complete wipe-outs; even in a drought, they might get a moderate yield (with better water management) plus an insurance compensation to cover some losses. This translates into **more consistent annual income**, enabling farmers to plan and invest, rather than fall into debt. We anticipate that by 2030, the **income variance** (year-to-year fluctuation) for participating farmers will have dropped significantly (possibly by half, given insurance and stabilized yields), compared to the wild swings of the past.

- **Higher Value Addition and Profitability:** Through quality improvements and marketing (like more oil sold as IGP or organic, and more tomatoes meeting quality specs due to better practices), farmers can earn higher prices. The IGP "Olio Lucano" designation obtained in 2020 is expected to yield dividends: as noted, Basilicata aims to unify branding and achieve price premiums. If half of Basilicata's olive oil can be sold at, say, €0.50 more per liter thanks to quality branding, that directly raises farm income per kg of olives. Likewise, the push for *"niche"* and processed products (baked olives, sun-dried tomatoes, sauces) creates local processing jobs and allows farmers involved in those value chains to capture a greater share of consumer expenditure. The plan encourages cooperatives to enter these niches, which could generate additional revenue on top of bulk sales. All this means farm families have not just more stable income, but potentially **higher average income** over the years. The profitability of sectors should improve: for instance, adopting precision irrigation might cost a bit, but if it improves tomato yield and quality, the farmer might earn more net profit per hectare (our table indicated a potential net gain of €100–200/ha from efficiency and yield effects). Multiply that by hundreds of hectares and it's a meaningful boost to rural prosperity.

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- **Community and Indirect Employment Benefits:** By keeping farmers in business, the plan also helps sustain the rural population and indirect jobs. A farm family that remains solvent continues to spend money locally – on farm supplies, groceries, schooling – which supports local retailers and service providers. Preventing the abandonment of olive groves also has a public-good effect: maintained groves mean less risk of wildfires and landslides, which can cause economic damage and costs for communities. Additionally, many of Basilicata's inner areas suffer from unemployment; engaging people in new agricultural projects (like the cooperative saffron venture or a young farmers program to plant new olive orchards) can chip away at that joblessness. While the direct employment in farming might be modest in absolute numbers (agriculture itself is often a small percentage of formal employment), the **social impact is high** because these jobs are in areas where alternatives are few. Every job kept or created in a village might be the difference that allows a family to stay rather than migrate.

In concrete terms, we can expect the following by 2030:

- **Farm retention:** The number of active farmers in tomatoes/olives remains steady or even grows slightly, reversing a decline. For olives, halting farm abandonment is a big win (the plan explicitly targets preventing further 5–10% area abandonment over the period).
- **Employment numbers:** At least **500 seasonal farm jobs** preserved in tomato harvesting and **1,000 in olive harvesting/processing** (these are rough estimates given the scale of production we aim to maintain). Plus, **100+ new jobs** in diversification (tourism, saffron, etc.) and project implementation (technicians, advisors).
- **Income stability:** Farm income surveys would show fewer farms with negative income years. The introduction of insurance means that even in a drought year, a tomato farmer might still receive 70% of normal income. Olive farmers, with combined modest yield plus aid, should avoid the scenario of zero income. Over 2025–2030, an average olive farm's income might fluctuate within a manageable band (supported by off-farm diversification), rather than dropping to zero as in 2024.
- **Youth and skills:** An increase in young farmer entrants or successors, thanks to the incentives and new opportunities. If even 50 young people decide to take up farming or agro-business in Basilicata because they see a future in tomatoes/olives (with innovation and profitability), that contributes to long-term employment and demographic balance.

By reinforcing the economic viability of agriculture, the plan also contributes to **social stability**. Farming has traditionally been a buffer in Basilicata's economy – during tough times, families rely on their small plots for subsistence or extra income. Ensuring that these small farms remain productive under climate change is essentially ensuring a safety net for rural society. As one local leader highlighted, *"olivicoltura… rappresenta una parte fondamentale della nostra economia… ma anche un patrimonio culturale"* – the olive sector is not only economic but cultural heritage and landscape. By saving it, we are also preserving intangible social employment (the tradition of communal harvests, local festivals around crushing oil, etc., which all have micro-economies around them).
In summary, **the plan's impact on employment and income** will be strongly positive: it will **secure existing agricultural jobs, create new ones through diversification and innovation, and stabilize the earnings of thousands of farm families**. This translates to a more resilient rural economy for Basilicata. The collective result is that agriculture can continue to underpin regional employment (maintaining that ~5-6% contribution to GVA and the associated jobs) and even serve as a lever for inclusive growth (through community projects). The broader Basilicata community benefits from reduced out-migration, preserved landscapes (which can attract tourism dollars), and the economic multiplier of a healthy farm sector.

Conclusion

Basilicata's hybrid plan for tomatoes and olives offers a **comprehensive roadmap** to navigate the twin challenges of climate change and fiscal constraint. By **stabilizing key zones** (like the Lavello and Metaponto plains for tomatoes, and the traditional olive-growing hills) and simultaneously **fostering transitions** to climate-smart practices and diversified livelihoods, the strategy builds resilience from the ground up. We have identified concrete actions – from repairing dams and installing drip lines to introducing saffron crops and insurance schemes – each tied to clear benefits and funding avenues. The phased timeline ensures urgent

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needs are met without losing sight of long-term goals, and periodic reviews will keep the plan adaptive to new information.

Crucially, this plan balances **economic priorities** (farm income, employment) with **environmental imperatives** (water conservation, land stewardship under climate stress). It does so in a way that acknowledges limited public budgets: by leveraging EU funds, encouraging private investment, and targeting supports where they have the highest payoff (e.g. preserving an entire supply chain or a community's economic backbone). The inclusion of both tomatoes and olives – rather than focusing on one crop – creates synergies: for instance, knowledge from water-saving in tomato fields can be applied to irrigating olive trees; diversified farms can bridge the two sectors (an olive farmer might rotate part of land into vegetables); and policymakers can address the sectors in a unified rural development framework.

By 2030, if this plan is implemented effectively, Basilicata will have: **tomato fields that are productive even in hotter, drier summers**, thanks to better water infrastructure and farming techniques, and **olive groves that continue to thrive as a source of quality oil and rural jobs**, supported by targeted irrigation, new varieties, and value-added ventures. Farmers will be more empowered – using climate information, new technologies, and cooperative structures – to face whatever challenges arise. The regional economy will be less at the mercy of the weather, with fewer shocks rippling through it.

In essence, Basilicata can become a model of **climate-resilient Mediterranean agriculture**, demonstrating how a region with inherent vulnerabilities can innovate and adapt its traditional strengths (its "flagship" tomatoes and olives) for a sustainable future. The plan sets Basilicata on that path, ensuring that the region's fertile plains and ancient olive terraces continue to provide livelihoods and identity for its people under the sun of a changing climate.

Sources:

- Basilicata tomato sector climate impact – Terra e Vita / Tomato News reports on 2024 drought; ANSA news on water emergency in Metapontino.
- Basilicata olive sector crisis – Oprol statements on 95% production drop and call for disaster status; Olive Oil Times on drought impacts.
- Basilicata agriculture context – MDPI research on marginal areas and economic share; Italia.it on olive production areas and farm numbers.
- Adaptation practices – Olive farmer adaptation (kaolin, mulching); LIFE AgroClimaWater project in Basilicata; FreshPlaza on tomato irrigation tech adoption.
- Funding and policy – Basilicata olive law (2015) provisions; CAP coupled support info.

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