Contingency planning arguments - the case of the Czech republic -



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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 Czech Republicwith a primary view on contingencies that may arise from climate change 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.

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Part 1: Risk affecting production of clover and alfalfa

1. Farms and animal production

Animal production: farms and acreage

Overview

1. Number & Share of Animal-Dependent Farms

According to recent EU agricultural classifications:

> Agricultural holdings (farms) in Czechia: ~26,530 (csu.gov.cz, agriculturejournals.cz, agriculture.ec.europa.eu)

> Specialist grazing livestock farms (e.g., cattle, sheep, goats): ~34.6 % of all farms (csu.gov.cz)

- That is approximately 9,180 farms (0.346 × 26,530).

These are the farms most reliant on animal products (meat, milk, wool, etc.) and typically use pasture or forage crops like clover/alfalfa.

2. Total Acreage & Share of Agricultural Land

> Total agricultural land in Czechia: ~3.5 million hectares (en.wikipedia.org, agricecon.agriculturejournals.cz, agriculture.ec.europa.eu)

> Land used by specialist grazing livestock farms: ~23.8 % of ag land (csu.gov.cz)

- That equals about 833,000 hectares (0.238 × 3.5 million ha).

Summary

Metric	Value	Context
Total farms	~26,530	All Czech agricultural holdings (agriculture.ec.europa.eu, csu.gov.cz)
Animal-dependent farms	~9,180	34.6 % of all farms, specialist grazing livestock
Total agricultural land	~3.5 million ha	Covers ~45 % of national territory
Land under animal-dependent farms	~833,000 ha	23.8 % of total ag land

Interpretation

> Over **one-third of farming enterprises** in the Czech Republic focus on **animal-based production**.

> These farms manage around **23.8 % of the country's agricultural land**—a significant share reliant on forage crops like clover and alfalfa.

> Consequently, **climate impacts on forage yields** will directly affect nearly **10,000 farms** and their **>800,000 ha** of farmland.

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Contribution of animal production to farm income

In Czech animal-producing farms, animal production plays a major role in farm output, both in terms of value and income.

Overview

1. Value of Agricultural Output (2024, current prices)

According to the Czech Statistical Office:

> Total agricultural output: 172.1 billion CZK.
> Crop output: 89.4 billion CZK.
> Animal (livestock) output: 70.5 billion CZK (csu.gov.cz).

This means animal output represents approximately 41 % of total agricultural output in monetary terms.

2. Contribution to Farm Income

> Agricultural entrepreneurial (farm) income reached 13.323 billion CZK in 2024 (csu.gov.cz).
> Animal production increased by 0.5%, while crop production fell by 5.2% (csu.gov.cz).

However, exact farm-level income attribution to animal production vs. crops requires detailed data (e.g., breakdown from FADN). The available national-level data allow the following approximation:

> If we assume animal output contributes ~41 % of output value,
> And if profitability is relatively proportional, then animal-derived income would likewise be around 40–45 % of total farm income.

Summary

> Animal production value: ~70.5 billion CZK (~41 % of total agricultural output).
> Farm-level income share: Estimated around 40 – 45 % of total farm entrepreneurial income.

This highlights how vital animal production is—the nearly 42 % economic share confirms that disruptions to livestock feed systems (clover, alfalfa, etc.) would directly threaten a substantial portion of farm revenues.

Note: For absolute precision, a breakdown from the Czech Farm Accountancy Data Network (FADN) would be ideal—but based on national output statistics, **animal farming contributes roughly two-fifths of farm income**.

2. Hazards

Climate-change induced weather fluctuations affecting production of clover/alfalfa

Weather fluctuations due to climate change are already affecting the production of clover and alfalfa, and are expected to continue doing so. These crops, while somewhat resilient, are sensitive to temperature extremes, drought, and shifting precipitation patterns, all of which are becoming more common due to climate change.

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Key Effects on Clover and Alfalfa:

1. **Drought and Water Stress**
   > Alfalfa is relatively drought-tolerant due to its deep roots, but prolonged or repeated drought reduces yield and forage quality.
   > Clover, especially shallow-rooted types like white clover, suffers more during droughts, often leading to declines in pasture persistence.
2. **Heat Stress**
   > Excessive heat reduces flowering, biomass accumulation, and nitrogen fixation in both crops.
   > High temperatures accelerate plant maturity, shortening the harvest window and reducing nutrient content.
3. **Irregular Precipitation**
   > Both crops benefit from moderate, consistent rainfall.
   > Flooding or waterlogging can damage roots and reduce yields.
   > Inconsistent rainfall disrupts planting schedules and increases disease risk.
4. **Pests and Diseases**
   > Warmer, wetter conditions foster new pests and pathogens, some of which affect legumes.
   > Mild winters can allow pest populations (e.g., aphids, weevils) to overwinter and expand.
5. **Carbon Dioxide (CO_2) Effects**
   > Rising CO_2 can stimulate photosynthesis and growth in legumes.
   > But benefits are often offset by nutrient dilution, water stress, and other stressors.

Adaptation Strategies:

> Developing and using drought- or heat-tolerant cultivars.
> Adjusting planting and harvesting times.
> Diversifying pasture species to spread climate risk.
> Using irrigation and soil moisture conservation techniques.

In summary, while clover and alfalfa can still be viable in many systems, climate change is making their production less predictable and more risk-prone, requiring adaptation in both breeding and management.

Major hazards related to climate change and affecting production of clover/alfalfa

Overview

1. **Drought and Water Scarcity**
   > Increasing frequency and severity of droughts in spring and summer are one of the most critical threats.
   > Alfalfa, although more drought-tolerant than clover, suffers from reduced regrowth and lower protein content under prolonged dry spells.
   > Clover, especially white and red clover, is more shallow-rooted and less drought-tolerant, making it particularly vulnerable.

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2. Heatwaves and High Temperatures

> More frequent summer heatwaves reduce forage quality and yield.
> High temperatures during flowering can lead to premature flowering, reduced seed production, and stress on nitrogen fixation.

3. Erratic Precipitation and Heavy Rainfall

> Shifts in rainfall patterns, with heavy downpours following dry periods, lead to:
- Soil erosion
- Root damage
- Leaching of nutrients

> Waterlogged soils can also damage legume root systems and inhibit growth.

4. Increased Pest and Disease Pressure

> Milder winters and warmer temperatures support overwintering of pests (e.g., aphids, alfalfa weevils) and the spread of fungal and bacterial diseases.
> This can reduce stand longevity and forage quality.

5. Soil Degradation

> Climate impacts exacerbate soil degradation through:
- Desiccation during drought
- Erosion after heavy rains

> Poor soil structure affects the root development and persistence of clover and alfalfa.

Summary Table

Hazard	Impact on Clover & Alfalfa
Drought	Lower yields, poor regrowth
Heatwaves	Reduced flowering and quality
Heavy Rain	Root damage, erosion
Pests & Diseases	Crop loss, reduced longevity
Soil Degradation	Weaker stands, reduced productivity

Adaptation Outlook for Agriculture

The Czech Republic is increasingly focusing on climate-resilient farming, including:

> Introducing drought-tolerant cultivars
> Optimizing sowing dates
> Improved water retention in soils
> Diversified crop rotations to stabilize systems

Both clover and alfalfa remain important for fodder and soil fertility, but managing climate risks is becoming essential for sustainable production.

Define a severe drought that could be linked to climate change

A severe drought linked to climate change can be defined as a prolonged and unusually intense period of water deficit, driven or exacerbated by climate change-related factors, such as higher temperatures, altered precipitation patterns, and increased evapotranspiration. It typically results in substantial ecological, agricultural, and socio-economic impacts.

Key Characteristics of a Severe Climate-Change-Linked Drought:

1. Duration

> Lasts months to years, not just short dry spells.
> Can span across growing seasons, reducing the ability of ecosystems or farms to recover.

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2. Intensity

> Substantially below-normal precipitation, often measured by indices like:
  - Standardized Precipitation Index (SPI): SPI ≤ -1.5
  - Palmer Drought Severity Index (PDSI): PDSI ≤ -3 indicates severe drought

> Often coupled with record high temperatures, which increase evaporation and worsen dryness.

3. Scope

> Affects wide geographical areas, such as entire river basins or agricultural regions.

> Involves multiple sectors: agriculture, water supply, forestry, and energy.

4. Ecological and Agricultural Impact

> Crop failures, pasture die-off, and reduced water availability for livestock.

> Depletion of soil moisture, groundwater, and surface water.

> Long-term damage to ecosystems (e.g., biodiversity loss, tree mortality).

5. Climate Change Linkage

> Occurs more frequently and intensely than historical norms.

> Attribution studies often link such droughts to human-caused global warming through:
  - Higher temperatures
  - Shifts in atmospheric circulation patterns (e.g., jet stream changes)
  - Reduction in snowpack or earlier snowmelt

Example

The 2015–2020 Central European drought, including the Czech Republic, was linked to:

> High-pressure systems blocking rainfall

> Record-breaking summer heat

> A climate change signal amplifying natural variability

In Summary

A severe drought linked to climate change is an extreme, persistent water deficit event, made more likely or intense by anthropogenic warming, and marked by high temperatures, low precipitation, and major socio-ecological consequences.
This kind of drought represents one of the clearest and most damaging climate change stressors for agriculture and food security.

Scientifically-based forecasts about severe drought

There are scientifically based forecasts and observed trends indicating that severe droughts in the Czech Republic are likely to become more frequent, intense, and prolonged in the coming decades—driven in large part by climate change.

Observed Trends and Recent Events

> Between 2015 and 2021, the Czech Republic experienced one of its worst droughts on record, compounded by unusually high temperatures. This has already damaged forests and agriculture (climate.peopleinneed.net).

> In 2020, the country endured seven consecutive years of drought, labeled the most severe in 500 years (osw.waw.pl).

> As of May 2025, about 25% of Czech land was already under “extreme drought,” with early-season soil moisture deficits—so-called "green droughts"—suggesting hidden severity (english.radio.cz).

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Model-Based Projections

1. **CMIP6 climate models (via World Bank/CCKP):**
   - Predict hotter and drier summers for the Czech Republic under most emissions scenarios (SSP).
   - Indicate more frequent and longer spring-to-summer drought periods (climateknowledgeportal.worldbank.org).
2. **Euro-CORDEX regional climate simulations:**
   - Forecast wetter winters, but significantly drier summers, raising drought risk during the growing season (researchgate.net).
3. **Scientific studies (Frontiers in Earth Science, Nature, Sci Total Environ):**
   - Confirm CMIP6 and CMIP5 model results indicating increasing temperature and decreasing summer precipitation (nature.com).
   - Soil moisture and evaporative stress are expected to intensify, particularly affecting Central Europe (nature.com).

Timeline of Forecasts

> Short to mid-term (2020–2050): Expect more frequent moderate-to-severe droughts, especially from late spring through early autumn .
> Mid to late century (2050–2100): Under high-emissions pathways, heat-driven megadroughts (lasting years) become possible (nature.com).

Agricultural Implications

> These drought forecasts directly influence pasture-based crops like clover and alfalfa, which rely on steady moisture during key growth phases.
> Frequent soil moisture deficits and hot, dry summer spells can significantly reduce yields, protein content, and regrowth capacity.

Summary

A scientifically credible picture is emerging: Czechia is already facing severe drought conditions, and climate models consistently forecast a future with hotter, drier summers and more intense, longer-lasting droughts—especially during the agricultural growing season. If mitigation efforts lag, the risk of multi-year "megadroughts" will increase significantly.

3. Effects of drought hazards

Expectations on future droughts and consequences for production of clover/alfalfa and farm animals

Based on current climate forecasts for the Czech Republic, the increasing frequency and severity of droughts and heatwaves—particularly during the growing season—pose significant risks to clover and alfalfa production, which in turn could disrupt animal farming systems, especially those reliant on pasture and forage-based feeding.

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Impact on Clover and Alfalfa Production

1. **Reduced Yields**
   > Drought stress and high temperatures will lower biomass production.
   > Clover is shallow-rooted and more vulnerable to early-season droughts ("green droughts"), resulting in poor spring growth.
   > Alfalfa has deeper roots and some drought resilience, but persistent water deficits reduce regrowth between cuts and lower protein content.
2. **Poor Forage Quality**
   > Under heat and water stress:
   - Lower crude protein levels
   - Increased fiber, reducing digestibility

   > This diminishes the nutritional value of both hay and fresh fodder.
3. **Reduced Stand Persistence**
   > Perennial stands of clover and alfalfa may suffer from:
   - Soil moisture depletion
   - Root damage from heat/drought
   - Fungal and insect stress (e.g., root rots, aphids, alfalfa weevil)

   > Replanting cycles may shorten, increasing costs.
4. **Disrupted Sowing and Harvest Schedules**
   > Late spring droughts can prevent germination.
   > Erratic rains complicate haymaking—leading to mold or nutrient loss in stored fodder.

Consequences for Animal Production

1. **Feed Shortages**
   > Less homegrown forage means greater reliance on expensive imports of hay or concentrates.
   > Small and medium farms could face financial strain or reduce herd sizes.
2. **Lower Animal Productivity**
   > Poor forage quality reduces:
   - Milk yield in dairy cows
   - Weight gain in beef and lamb
   - Fertility rates

   > Increased need for supplemental feeding, especially in dry summers.
3. **Rising Costs**
   > Cost of:
   - Irrigation
   - Replanting damaged pastures
   - Supplemental protein or roughage

   > Overall farm profitability drops, especially for grass-fed or organic systems.
4. **Increased Vulnerability**
   > Repeated bad forage years make systems less resilient.
   > Risk of long-term decline in pasture-based livestock unless adaptation occurs.

Adaptation Opportunities

Strategy	Application
Drought-tolerant cultivars	Use resilient clover/alfalfa varieties
Diversified forages	Add deep-rooted species (e.g., sainfoin, chicory)
Irrigation	Supplement rainfall where feasible
Soil management	Mulching, compost, and water retention
Early warning systems	Use drought forecasts for decision-making

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Conclusion

If current drought trends and climate forecasts hold, the Czech Republic's clover and alfalfa production will be increasingly challenged, especially during the peak forage-growing months (May–August). This will directly reduce the availability and quality of feed, posing serious risks to animal productivity, particularly in dairy and beef systems that rely on high-protein legumes.
Adaptive management—from cultivar selection to water-efficient practices—will be critical to maintain stable livestock output in a more volatile climate.

With no adaptation in feed production to climate change, consequences at farm level, along the food chain and for the availability of food

If no adaptation is implemented in feed production—especially in the face of increasing droughts and climate variability in the Czech Republic—the consequences will ripple from the farm level through the entire food chain, ultimately threatening food availability and affordability.

1. Consequences at the Farm Level

Decreased Forage Supply
> Clover and alfalfa yields decline during key growth periods (spring/summer).
> Hay and silage reserves shrink, especially in years with successive droughts.

Higher Costs and Financial Stress
> Farmers must purchase imported or commercial feeds, which are:
- More expensive
- Subject to global market volatility

> Profit margins shrink, particularly for small and medium-sized farms.

Reduced Livestock Productivity
> Lower-quality forage leads to:
- Reduced milk yields
- Lower growth rates and meat quality
- Poorer animal health and fertility

> Some farmers may be forced to reduce herd sizes or exit livestock farming altogether.

2. Consequences Along the Food Chain

Feed Industry Pressure
> Increased demand for soy, grain-based, or imported protein feeds, driving:
- Price spikes
- Greater import dependency
- Exposure to global supply shocks (e.g., trade disruptions)

Dairy and Meat Sector Disruption
> Lower domestic production of milk and meat leads to:
- Higher processing costs
- Underutilization of dairy/meat infrastructure
- Increased imports of raw materials and finished products

Retail and Distribution Challenges
> Fluctuating prices and unstable supplies make it hard for:
- Retailers to plan
- Consumers to afford high-quality local products

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3. Consequences for Food Availability and Food Security

Less Locally Produced Animal Products

> Milk, cheese, butter, beef, lamb, pork may become:

- Scarcer in local markets
- More expensive
- Replaced by lower-quality imports

Rising Food Prices

> Feed shortages drive up production costs → passed on to consumers.

> Vulnerable populations face nutritional insecurity, especially in rural and low-income households.

Loss of Food System Resilience

> Reliance on fragile import chains makes the national food supply vulnerable to:

- Global price shocks
- Trade disruptions (e.g., conflicts, export bans, transport failures)

Summary Table of Consequences

Level	Consequences of No Adaptation
Farm	Lower forage yields, high costs, reduced herd size, farm closures
Feed Chain	More imports, price volatility, environmental externalities
Livestock Sector	Lower productivity, underused facilities, job losses
Consumers	Higher prices, reduced availability, lower dietary quality
Food Security	Increased vulnerability, dependence on imports, reduced resilience

Final Note

Failing to adapt forage production systems like clover and alfalfa to climate change undermines the foundation of livestock farming—which is a key part of the Czech Republic's agricultural economy. Without proactive measures, the risks will cascade, threatening not only farm viability but also national food sovereignty and public nutrition.

4. Adaptation opportunities

Proposal for long term adaptation of animal producing farms for reducing the effect of droughts on the production of clover/alfalfa

Long-term adaptation proposal for animal-producing farms in the Czech Republic, focused on reducing the impact of droughts on clover and alfalfa production—both critical forage crops in pasture-based livestock systems.

Goal

To strengthen the long-term resilience of clover and alfalfa production systems under increasing drought pressure, ensuring stable and affordable feed supply for animal-based farms.

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Adaptations

1. Forage System Diversification

Introduce Drought-Tolerant Species

> Add deep-rooted legumes (e.g., sainfoin, birdsfoot trefoil) and herbs (e.g., chicory, plantain) to pasture mixes.

> Rotate or inter-seed drought-tolerant grasses (e.g., festulolium, cocksfoot, tall fescue) with clover and alfalfa.

Benefits

> Improves forage persistence, even in dry years.

> Enhances biodiversity and soil resilience.

2. Smart Water Management

Efficient Irrigation Systems:

> Invest in drip or subsurface irrigation for high-value forage areas.

> Use solar-powered pumping for cost-efficiency.

Soil Water Retention:

> Apply organic mulches, compost, and biochar to improve soil structure.

> Adopt reduced or no-till to minimize evaporation losses.

Water Harvesting:

> Install ponds, swales, or retention basins to capture rainwater for supplemental use.

3. Adaptive Cultivar Use & Rotation Planning

Drought-Resistant Varieties:

> Select clover and alfalfa cultivars bred for drought tolerance, deeper roots, and regrowth ability.

Rotational Planning:

> Adjust sowing and harvesting windows to avoid peak heat and moisture stress periods.

> Use early-maturing varieties to complete critical growth phases before dry spells.

4. Monitoring & Early Warning

On-Farm Monitoring:

> Use soil moisture sensors, forage biomass tools, and weather stations to guide irrigation and harvest decisions.

Regional Tools:

> Subscribe to national drought monitoring systems (e.g., CHMI, HAMR).

> Integrate seasonal forecasts into grazing and planting plans.

5. Farm-Level Collaboration & Investment

Shared Infrastructure:

> Form cooperatives for:

- Shared irrigation infrastructure
- Forage processing and storage
- Joint purchasing of drought-tolerant seed

Funding & Policy Support:

> Engage in CAP-funded rural development schemes and eco-schemes that reward:

- Resilient pasture management
- Biodiversity
- Water conservation

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6. Forage Storage and Feed Security

Emergency Feed Buffers:

> Increase on-farm production and storage of haylage, silage, and pelletized forage.

> Use rotational forage banks (fields set aside for emergency cutting).

Summary: Long-Term Resilience Roadmap

Pillar	Strategy
Crop Diversity	Add resilient legumes/herbs
Water Resilience	Improve soil & water systems
Genetics & Timing	Use stress-adapted varieties & rotations
Smart Tech	Monitor soil/moisture + use forecasts
Collaboration	Shared tools, CAP support
Feed Buffering	Emergency reserves & better storage

This approach aims to secure feed supply, protect farm income, and reduce reliance on external inputs—all under worsening climate conditions. Let me know if you'd like this turned into a visual roadmap or funding-ready summary.

Funding-ready summary

Funding-ready summary of the long-term adaptation proposal, designed to support grant applications or policy submissions related to climate-resilient forage systems for animal-producing farms in the Czech Republic.

Title: Drought-Resilient Forage Systems for Sustainable Animal Production in the Czech Republic (Duration: 5–7 years (pilot + scale-up phases))

Objective

To safeguard the productivity and viability of Czech livestock farms by increasing the drought resilience of clover and alfalfa systems, thereby ensuring a stable, high-quality feed supply under worsening climate stress.

Key Goals

1. Stabilize forage yield and quality through diversified, drought-resilient crop systems.
2. Reduce farm-level vulnerability to feed shortages and income loss during dry years.
3. Strengthen national food security by supporting local animal-based food production.

Core Components

Component	Description	Estimated Share of Budget
Forage System Diversification	Introduce drought-tolerant forage species (sainfoin, chicory, festulolium)	20%
Smart Water & Soil Management	Improve irrigation efficiency, build on-farm water retention, apply soil conditioners	25%
Adaptive Varieties & Rotations	Deploy drought-tolerant clover/alfalfa cultivars, adapt planting schedules	15%
Monitoring & Forecasting Tools	Install sensors and use digital tools to track forage stress and plan responses	10%
Feed Storage Infrastructure	Expand hay/silage storage, create forage banks for drought years	20%
Cooperation & Knowledge Sharing	Farmer training, joint equipment pools, regional demonstration sites	10%

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Funding Sources (Suggested)

> EU CAP Strategic Plan 2023–2027: eco-schemes, rural development, and investment measures.
> National Recovery Plan: climate-smart agriculture and digitalization in rural areas.
> EU LIFE or Horizon Europe: for pilot innovation and knowledge transfer components.
> Private co-financing or cooperative cost-sharing: for on-farm infrastructure.

Expected Outcomes (By Year 5)

Indicator	Target
Farms adopting drought-resilient forage systems	500+
Hectares of improved forage land	25,000 ha
Reduction in emergency feed imports (vs. baseline)	30%
Increase in average summer forage yields (drought years)	+15–20%
Farmer-reported income stability	+20%

Strategic Fit

> Climate resilience: Directly addresses EU and national priorities on adaptation and food security.
> Environmental benefits: Promotes biodiversity, soil health, and water conservation.
> Economic sustainability: Reduces input dependency and strengthens farm income reliability.

Development path with monetary consequences

Funding-ready adaptation proposal with monetary estimates and a clear 5-year development path, targeting Czech livestock farms at risk from drought-driven forage shortages.

Proposal: Drought-Resilient Forage Systems for Sustainable Animal Production

This project aims to build long-term resilience in clover and alfalfa-based forage systems by equipping animal-producing farms with the tools, knowledge, and infrastructure needed to withstand recurring droughts. The program combines crop diversification, soil-water technologies, digital monitoring, and farmer cooperation to secure feed supplies and protect livestock productivity.

Objectives

> Strengthen on-farm feed autonomy
> Protect income in drought years
> Stabilize milk and meat production in the Czech Republic

Total Budget (5 Years): €48.5 million

Component	Description	Budget (EUR)	% of Total
Forage Diversification	Drought-tolerant seeds, pasture renovation on 25,000 ha	€9.5M	20%
Water & Soil Systems	Small-scale irrigation, composting, soil conditioners	€12.0M	25%
Adaptive Varieties & Scheduling	Drought-resistant clover/alfalfa cultivars, reseeding tools	€7.5M	15%
Monitoring & Forecasting	Soil sensors, weather apps, extension services	€4.5M	10%
Feed Storage Resilience	Haylage bunkers, mobile balers, community feed banks	€9.5M	20%
Training & Coordination	Farmer networks, advisory services, pilot plots	€5.5M	10%

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Development Path (2025–2030)

Phase 1: Foundation & Pilots (Year 1–2)
Budget: €12.5M
> Identify and enroll 200 pilot farms across 4 drought-prone regions.
> Renovate 5,000 ha of pasture using new legume/grass mixes.
> Install basic irrigation and moisture retention measures.
> Build 20 cooperative feed banks and train 50 advisors.

Phase 2: Scaling (Year 3–4)
Budget: €24.0M
> Expand to 500+ farms and 20,000 ha improved forage.
> Introduce weather-smart crop planning tools.
> Deploy 1,000 sensor sets for digital monitoring.
> Support joint purchases of balers, seeders, and solar pumps.

Phase 3: Consolidation & Sustainability (Year 5)
Budget: €12.0M
> Formalize local forage cooperatives.
> Integrate systems into CAP eco-schemes for post-project continuity.
> Measure impact on yields, livestock productivity, and input savings.
> Prepare replication guidelines for wider EU application.

Key Impact Metrics

Outcome	Target by 2030
Farms engaged	500–600
Drought-resilient forage hectares	25,000+ ha
Yield increase in dry years	+15–25%
Emergency feed purchases avoided	€8–10M/year saved
Reduction in pasture failure	–40% vs. Baseline
Farmer income stability	+20% in drought years

Funding Strategy

> Primary: EU CAP Strategic Plan (eco-schemes, investment support)
> Supplementary: LIFE, Horizon Europe (innovation, demonstration)
> National: Rural Development Program (PRV), Green Recovery funds
> Private: Cooperative co-financing (equipment, infrastructure)

Conclusion

This €48.5M, five-year initiative will create climate-adaptive, feed-secure livestock farms in the Czech Republic—preserving productivity, incomes, and national food resilience in the face of escalating drought threats.

5. Farm situation development

Farm income today and after transition

Estimation how farm income would develop from today through the post-transition period
> Forage yield recovery
> Reduced drought-related losses
> Cost savings
> Stabilized or improved livestock productivity

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Current (Pre-Adaptation) Situation (2025)

Typical livestock farms face:

> Declining forage yields due to drought (↓15–30%)
> Rising feed costs from emergency hay/concentrate purchases
> Volatile milk/meat output
> Increased production risks

Average Income Estimate (2025):

> Farm income per livestock holding (animal-dominant farms): ~€50,000/year (estimate based on FADN data)
> With drought impacts:
- Losses of €8,000–€15,000/year on average (up to 30%) due to:
  > Lower yields
  > Emergency feed purchases
  > Reduced livestock productivity

➞ Net income under pressure: ~€35,000–42,000/year

Post-Transition Outlook (2030+)

Assuming full implementation of the €48.5M adaptation strategy, and successful scaling of improved forage and water systems, we can project:

Key Gains:

> Forage yields recover: +15–25% in drought years
> Emergency feed costs reduced: ~€8–10M/year nationally
> Livestock productivity stabilized: Milk/meat output recovers or grows
> Lower feed-import dependence and more stable cost structure

Average Income Estimate (Post-Transition):

> Increased on-farm forage value: +€6,000–€10,000/year per farm
> Reduced volatility & losses: Savings of €5,000–€8,000/year in drought years
> Improved productivity: +5–10% increase in animal sales or milk yield value

➞ Projected net farm income: ~€55,000–65,000/year

Income Development Timeline (Per Farm Estimate)

Year	Description	Avg. Net Farm Income (€)
2025	Pre-adaptation (drought-impacted)	€35,000–42,000
2026–2027	Pilot phase, partial gains	€43,000–48,000
2028–2029	Full implementation scaling	€50,000–58,000
2030+	Stabilized post-transition income	€55,000–65,000

Summary

> Baseline (2025): €35–42K
> Post-adaptation (2030+): €55–65K
+30–50% income increase, primarily from:
- Feed cost reductions
- Stable or increased livestock output
- Greater system resilience

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Priority activities if public funds are limited

If public funds are limited, the adaptation plan must focus on high-impact, cost-effective activities that can deliver resilience gains with minimal financial input.

Top Priority Activities with Estimated Costs (5-Year Plan)

Priority	Activity		Description	Budget (EUR)	Justification
1	Forage diversification with drought-tolerant species		Supply seeds for alfalfa alternatives (e.g., sainfoin, festulolium) and support pasture reseeding	€6.5M	Highest ROI—better yields under drought; lower cost per hectare (~€260/ha)
2	Advisory and training services		On-farm support for planting, soil management, rotations, and pasture planning	€2.0M	Enables correct implementation of low-cost, on-farm changes
3	Farmer weather and soil monitoring tools		Basic sensors + mobile alerts and drought forecasts for 500 farms	€1.5M	Early warning = reduced losses; affordable digital tools (~€3,000/farm)
4	Feed storage improvement (basic bunkers/hay shelters)		Low-cost, modular infrastructure to protect silage and hay	€4.0M	Reduces post-harvest losses and preserves quality in dry years
5	Community-level forage banks		Establish 15–20 shared emergency feed banks for local use	€2.5M	Protects against sudden feed shortfalls; improves cooperation

Total Cost for Priority Package: €16.5 million (5 years)

This is about one-third of the full €48.5M program and could:

> Support ~500 livestock farms
> Improve drought resilience on ~15,000 hectares
> Cut emergency feed costs by 30–50%
> Boost average farm income by €8,000–10,000/year during droughts

Optional Tier 2 (If Additional Funds Emerge)

Activity	Description	Cost (EUR)
Small-scale solar irrigation	Pumps & tanks for priority drought hotspots	€5.5M
Drought-adapted cultivar breeding trials	Support for national seed innovation	€2.5M
Digital grazing management tools	Forage planning + drought budgeting apps	€2.0M

Recommendation for Policymakers

If funding is tight, prioritize field-level actions that:

- Can be implemented immediately by farmers
- Have low per-hectare or per-farm costs
- Reduce risk and losses, even in partial drought years

Farm adaptation to climate change opportunities without external support

If farms do not receive external support, they can still adapt to climate change impacts—including drought-related risks to clover and alfalfa production—by taking low- to moderate-cost actions using internal resources. These actions are generally less comprehensive and slower to scale, but they can still offer measurable protection of income and feed supply.

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Self-Financed Adaptation Options (2025–2030)

Action	Description	Estimated Investment (per farm)	Impact on Income
1. Pasture renovation with drought-resilient mixes	Replace weak stands with sainfoin, festulolium, cocksfoot	€2,000–3,000 for 10–15 ha	+€4,000–5,000/year from improved yields and quality
2. On-farm composting & soil organic matter	Improve water retention using manure, mulch, compost	€500–1,000/year	+€1,000–2,000/year from better drought tolerance
3. Improved hay/silage management	Cover storage, optimize harvest timing, reduce spoilage	€1,500–2,500 one-time	+€2,000–3,000/year saved in avoided losses
4. Use of early warning weather tools	Free/low-cost drought alerts from CHMI or HAMR + local observation	€0–200	Avoided losses: ~€500–1,000/year (timely harvests, reduced damage)
5. Gradual diversification of forage crops	Add low-input species (plantain, chicory) incrementally	€500–800/year	Income buffer in dry years (~€1,000/year)

Total Investment Estimate (2025–2030)

Item	Cost (EUR)
Initial one-time investments (renovation, storage)	€3,500–5,500
Annual running costs (soil, reseeding, planning)	€1,000–2,000/year
5-year total (no external funding)	**€8,500–13,500** per farm

Income Impact Forecast (2025–2030)

Scenario	Average Net Income (€/year)	Notes
Baseline (2025, drought year)	€35,000–42,000	With feed losses, emergency purchases
Self-adapted farm (by 2028–2030)	€47,000–52,000	With forage improvements, better storage, less volatility
Estimated income gain	+€8,000–12,000/year	Partial recovery of pre-drought productivity

Summary

Factor	Value
Self-investment needed	€8,500–13,500 over 5 years
Income gain by 2030	€8,000–12,000/year
Payback period	~2 years after full implementation

Limitations Without Public Support

> Scale and speed of adoption slower
> Limited ability to invest in irrigation or digital tools
> Higher risk of partial failure in extreme drought years
> Vulnerable small farms may not have liquidity to act early

Recommendation

Farms can partially adapt without public support, but outcomes are less stable and slower. Those with moderate capital reserves should:

> Prioritize forage renovation
> Use free weather services
> Focus on preserving feed quality, not just yield

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6. Actor engagement

Actor engagement based on full public support, monetary consequences

With full public support, a successful climate adaptation program for livestock farms—focused on resilient clover and alfalfa systems—would require coordination across multiple actors. Each actor plays a specific role in financing, implementation, training, or monitoring.

Overview

1. Government Bodies (National & Regional)

Actor	Role	Type of Support
Ministry of Agriculture (MoA)	Lead coordinator; sets funding priorities, approves CAP co-financing	- Direct investment via RDP & CAP eco-schemes- National funding top-ups for infrastructure
State Agricultural Intervention Fund (SZIF)	Program administrator; disburses CAP/RDP funds	- Grant delivery- Payment audits- Monitoring indicators
Regional authorities	Local coordination, oversight of implementation	- Co-finance regional demo farms- Identify local adaptation zones

2. EU-Level Institutions

Actor	Role	Type of Support
European Commission (DG AGRI)	Provides co-financing through the CAP Strategic Plan	- ~65–80% co-financing rate for RDP measures- Approval of strategic interventions
Horizon Europe & LIFE Programme	Support innovation and cross-border pilots	- Grant funding for drought-adapted seed trials- Tools for digital pasture management
European Investment Bank (EIB)	Provides climate finance guarantees/loans	- Soft loans for irrigation or storage investments- Credit enhancement for coops/banks

3. Farmers and Producer Organizations

Actor	Role	Type of Engagement
Livestock farmers	Implement measures (sowing, storage, planning)	- In-kind labor- 20–35% co-financing for investments- Take part in training, reporting
Farmer cooperatives	Joint investment in feed banks, irrigation, machines	- Pooling of resources- Maintenance & management of shared tools
Farm Advisory Services (FAS)	Support planning, technical advice, recordkeeping	- Funded under CAP TA envelope- Provide 1:1 support to applicants

4. Research, Education, and Innovation Actors

Actor	Role	Type of Support
Czech University of Life Sciences (CZU), Mendel University	Lead trials on drought-resilient forage, soil strategies	- Run breeding programs- Conduct farm-level field trials
Agricultural Research Institutes (e.g., VÚRV, VÚŽV)	Scientific validation and adaptation design	- Support cultivar selection- Soil and climate risk mapping
Extension networks (e.g., AK ČR, ÚZEI)	Translate research into practice	- Develop farmer guides- Train regional advisors

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5. Private Sector and Financial Actors

Actor	Role	Type of Engagement
Input suppliers (seeds, irrigation, soil products)	Provide improved products to farmers	- Offer bulk discounts for CAP projects- Co-develop tailored seed mixes
Banks and rural credit providers	Offer loans for co-financing CAP-supported investments	- EIB-backed climate lending- Bridge loans for delayed reimbursements
AgTech startups	Offer pasture and soil monitoring apps, digital weather tools	- Partner with advisors- Provide affordable tech bundles to farms

Engagement Model: Who Invests in What?

Investment Area	Lead Actor	Funding Contribution
Forage diversification	Farmers + MoA + EU	30% farmer, 70% public
Feed storage & irrigation	Cooperatives + EIB + MoA	20–30% coop, 20% EIB, 50% CAP
Training & advisory	FAS + EU + MoA	Fully publicly funded
Digital monitoring tools	AgTech firms + CAP	60% public, 40% farm
Innovation trials	Universities + LIFE/Horizon	100% public (research grant)

Summary: Public Support Ecosystem for Drought Resilience

Role	Actor	Examples
Funders	MoA, EU CAP, LIFE, EIB	Grants, loans, guarantees
Implementers	Farmers, coops, advisors	Invest, manage, monitor
Knowledge providers	Universities, research institutes	Breeding, soil strategy
Service providers	AgTech, banks, suppliers	Tools, financing, inputs

With full public support, these actors together can transform livestock resilience in the Czech Republic, protect food security, and create a model for climate-adaptive farming across Central Europe.

Public-private investment model (2025–2030)

Total Program Budget: €48.5 million over 5 years (as previously outlined)

1. Investment Breakdown by Priority Area

Investment Area	Total Cost (€)	Public Funding Share	Private (Farmer/Coop) Share
Forage diversification (25,000 ha)	€9.5M	€6.7M (70%)	€2.8M (30%)
Water/soil systems (e.g., compost, irrigation)	€12.0M	€8.4M (70%)	€3.6M (30%)
Improved forage storage (haylage bunkers)	€9.5M	€6.2M (65%)	€3.3M (35%)
Monitoring tools (500 farms)	€4.5M	€2.7M (60%)	€1.8M (40%)
Resilient varieties & rotation planning	€7.5M	€6.0M (80%)	€1.5M (20%)
Advisory & training support	€5.5M	€5.5M (100%)	€0

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2. Actor-Specific Financial Contributions

Actor	Contribution (€)	% of Total	Role
EU CAP (via SZIF)	€25.0M	52%	Direct farm support (eco-schemes, RDP)
Ministry of Agriculture (MoA)	€10.0M	21%	Co-financing CAP, national training schemes
LIFE & Horizon Europe (EU R&I)	€3.5M	7%	Research, trials, digital tools
EIB (loan facility for coops)	€3.0M	6%	Low-interest loans for infrastructure
Farmers & Coops	€7.0M	14%	Co-financing, in-kind labor, upkeep

3. Example Farm-Level Investment and Support Package

Activity	Total Cost	Public Contribution	Farmer Contribution
Pasture reseeding (15 ha)	€2,500	€1,750	€750
Soil composting & mulch	€1,000	€700	€300
Silage shelter	€3,000	€2,000	€1,000
Mobile moisture sensor	€800	€480	€320
Advisory support (5 yrs)	€1,500	€1,500	€0
Total per farm (5 yrs)	**€8,800**	**€6,430**	**€2,370** (~27%)

Financing Summary by Actor Role

Actor Group	Investment Type	Est. Contribution (€)	Description
Government (CZ)	Grants, training, co-finance	€10.0M	Eco-schemes, farm advisory, regional programs
EU (CAP, LIFE, Horizon)	Grants, research	€28.5M	CAP support (€3.5M)
Farmers and Coops	Cash, in-kind	€7.0M	Co-financing of pasture, storage, tech
Banks (EIB-led)	Loans	€3.0M	Dedicated credit for shared infrastructure

ROI and Income Impact

> Farm income increase post-transition: +€8,000–12,000/year
> Payback time for farmer's contribution: ~2 years (based on saved feed costs and yield gains)
> Annual economic value of avoided feed imports: ~€8–10M at national scale

Final Takeaway

With full public support:

> **86% of total investment** can be covered by EU, national, and institutional funds
> Farms contribute a manageable **€1,500–3,000 each**, reaping long-term benefits
> This strategic funding mix ensures climate resilience **without overburdening farmers**, while protecting Czech food security and rural economies.

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7. Coordination

Suitable coordination scheme, coordination lead, and coordination funds

Currently, there is no single, fully integrated national coordination scheme in the Czech Republic specifically dedicated to climate adaptation in livestock feed systems (e.g., clover and alfalfa under drought stress). However, there are multiple existing frameworks and actors through which such a coordination mechanism could be organized and activated with full public support.

Existing Coordination Foundations

1. Czech Ministry of Agriculture (MoA)

> Leads the implementation of the CAP Strategic Plan 2023–2027.
> Manages climate adaptation measures under eco-schemes and Rural Development Program (RDP).
> Coordinates with EU institutions (DG AGRI), the State Agricultural Intervention Fund (SZIF), and regional authorities.

→ Role: Could serve as the national coordinator for drought-adaptation actions in forage systems.

2. State Agricultural Intervention Fund (SZIF)

> Implements CAP funding and emergency market measures.
> Already has the capacity to manage grant disbursement, monitor compliance, and report results.

→ Role**:** Execution of payments and implementation of farm-level measures (e.g., pasture support, feed subsidies).

3. National Climate Adaptation Strategy (2021–2030)

> Includes agriculture and water management as priority sectors.
> Identifies need for cross-ministerial coordination, but has limited operational mechanisms at farm level.

→ Role: Strategic framework that could be aligned with feed-system-specific coordination.

Current Gaps in Coordination

Issue	Gap
Sector-specific coordination	No dedicated task force for livestock feed and forage under drought
Multi-actor governance	Fragmented between research, extension, financing, and farmer organizations
Rapid crisis response	No fast-response unit linking weather forecasts to feed supply interventions

Recommended Coordination Scheme (Proposed)

Function	Lead Actor	Role
National Drought Coordination Hub	Ministry of Agriculture	Directs planning and response for feed-based drought adaptation
Financial Delivery & Monitoring	SZIF	Administers CAP, national and emergency drought grants
Scientific/Technical Advisory	CZU, Mendel Univ., research institutes (VÚRV, VÚŽV)	Advise on pasture mixes, seed trials, soil management
Farmer Engagement & Implementation	Farmer cooperatives, AK ČR	Coordinate shared investments, ensure local delivery
Climate Risk Intelligence	CHMI, HAMR, MoE	Provide drought alerts, seasonal forecasts, risk mapping

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Conclusion

While the Czech Republic has the institutional components for a coordinated public adaptation effort in livestock feed systems, a dedicated coordination mechanism—focused on drought and forage resilience—is not yet in place. Such a mechanism would require:

> Formal mandate from MoA
> Integration with existing CAP structures (SZIF, eco-schemes)
> Structured engagement with research and producer bodies
> Drought-specific protocols for early action and emergency support

Proposal for suitable system

Objective

Establish a coordinated, multi-actor governance structure to design, fund, implement, and monitor actions that protect livestock feed systems (pasture, forage) from climate-induced drought impacts.

Key Components of the Coordination Scheme

1. National Lead Agency

Lead: Ministry of Agriculture (MoA)
Role: > Strategic direction, inter-agency coordination, EU representation
> Approves investment priorities and adaptation protocols
> Oversees public communication and crisis activation

2. Financial Coordination and Delivery Unit

Lead: State Agricultural Intervention Fund (SZIF)
Role: > Administers CAP and national funding schemes (eco-schemes, RDP)
> Executes payments to farmers and cooperatives
> Tracks fund use and outputs

3. Technical and Scientific Advisory Board

Members:
> Czech University of Life Sciences (CZU) – forage systems
> Mendel University – agronomy and pasture planning
> VÚRV, VÚŽV – seed breeding, soil-water research
Role:
> Provide evidence-based design for seed mixes, soil management, and adaptation trials
> Validate drought-resilient practices
> Feed results into eco-scheme and subsidy design

4. Regional Delivery Partners

Members: Regional governments, advisory services, and farmer cooperatives (e.g., AK ČR, Zemědělský svaz ČR)
Role: > Enroll farmers into programs
> Deliver training and shared infrastructure
> Monitor local implementation and provide feedback

5. Climate Intelligence & Risk Monitoring Cell

Lead: CHMI (Czech Hydrometeorological Institute)
Support: Ministry of Environment, HAMR project
Role:> Monitor seasonal drought risks
> Trigger early warning protocols
> Feed data into SZIF and MoA for crisis funding

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Coordinated Funding Streams

Fund	Source	Managed By	Target Areas	Budget Role
Eco-schemes	EU CAP	SZIF	Soil cover, pasture resilience, mixed forage	Long-term adaptation
Rural Development Program (RDP)	EU CAP + MoA	SZIF	Investments in reseeding, feed storage, irrigation	Farm co-financing
Climate Resilience Reserve	National	MoA	Emergency feed subsidies, reseeding grants	Crisis response
Horizon Europe / LIFE	EU	MoA, universities	Innovation in seeds, tools, systems	Technical R&D
EIB Climate Loan Facility	EU financial institutions	Banks + MoA	Low-interest loans for coops	Infrastructure (e.g., feed banks)

Governance & Coordination Structure

National Feed Adaptation Council (NFAC)

Chair: Ministry of Agriculture
Vice-Chair: SZIF Director
Members:
> CHMI, MoE (climate/risk)
> CZU, Mendel University, VÚRV/VÚŽV (science)
> AK ČR, Zemědělský svaz ČR (farmers)
> CAP desk (DG AGRI liaison)

Functions:
> Meet quarterly; activate emergency protocols if needed
> Approve updates to drought response plans
> Monitor KPIs: yield loss, feed gap, income recovery

Estimated Coordination Budget (2025–2030)

Item	Budget (€)	Description
Coordination secretariat (staff, logistics)	€3.0M	MoA-led team managing day-to-day operations
Data and forecasting system upgrades	€2.0M	CHMI drought tools + integration with HAMR
Technical advisory & pilot trials	€4.0M	Universities + research grants (LIFE/Horizon)
National training & capacity building	€3.0M	Farmer outreach, advisors, regional partners
Total Coordination Envelope	**€12.0M**	To be embedded in CAP TA budget and MoA climate funds

Summary: Coordination at a Glance

Function	Actor	Funding Source
Strategic Lead	Ministry of Agriculture	National & EU (CAP)
Payment Execution	SZIF	EU CAP (Eco-schemes, RDP)
Scientific Design	CZU, Mendel, VÚRV	Horizon Europe, LIFE
On-Ground Action	Farmer Coops, Advisors	CAP, co-financed by farmers
Climate Intelligence	CHMI, MoE	National budget, EIB digital grants

8. Contingency

Drought contingency support for reducing negative effects on the availability of animal products in markets and on farm income

If a sudden drought hits the Czech Republic, severely affecting clover and alfalfa production, the consequences for animal production, farm income, and food supply would be immediate and significant—especially without pre-existing adaptation.

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Scenario: Sudden Drought in 2026

Impact

Immediate Impacts on Clover and Alfalfa:

> Yield losses: –30% to –60%
> Protein content drops: Poor forage quality
> Regrowth failure after first cut (especially for alfalfa)
> Higher incidence of pest and disease outbreaks

Impacts on Animal Production

Impact Area	Consequence
Feed shortages	Farms cannot meet animal needs from own land
Emergency feed purchases	Price spikes (+50–100% for hay, silage, concentrates)
Reduced milk & meat output	–10% to –25% in affected herds
Livestock health/fertility	Stress-related illnesses, reduced conception
Destocking	Smaller farms may sell animals prematurely at low prices

Impacts on Farm Income

Type	Estimate
Extra feed costs	€7,000–12,000 per average livestock farm
Income loss (milk, meat, breeding stock)	€8,000–15,000 per farm
National total income loss (animal farms)	~€100–150 million across ~9,000 farms
Risk of insolvency	Especially for small/medium farms with no buffer

Emergency Support Measures to Reduce Impacts

1. Targeted Feed Subsidies

> Short-term grants to cover up to 60–70% of the cost of purchased hay, alfalfa, or protein concentrates.
> Budget: ~€35–50 million nationally to cover 9,000 affected farms.
> Prevents liquidation of herds and stabilizes milk/meat output.

2. Crisis Loan Guarantees (via SZIF/EIB)

> Fast-track zero- or low-interest loans for emergency feed, water, and veterinary expenses.
> Budget: €20 million credit line, with government guarantees to lower default risk.

3. Temporary Import Facilitation

> Waive import duties and simplify logistics for emergency fodder (e.g., lucerne, pellets) from neighboring countries (Austria, Slovakia, Germany).
> Helps stabilize prices and availability.

4. Market Stabilization for Animal Products

> Intervention purchases (e.g., milk powder, beef) if prices collapse due to distress sales.
> Buffer stock programs or targeted buying for hospitals, schools, etc.

5. Emergency Reseeding Grants (Post-Drought Recovery)

> 70–80% support for pasture and forage reseeding in autumn 2026 or spring 2027.
> Total need: ~€20–25 million for reseeding 250,000 ha nationally.

Policy and Coordination Needs

Area	Action
National government (MoA, SZIF)	Activate crisis funds; coordinate aid distribution
EU CAP emergency framework	Trigger Article 219 (crisis measure) for rapid market and income support
Farmers & coops	Organize local feed redistribution; prioritize most affected members
Extension services	Advise on emergency rations, herd management, reseeding timing

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Summary: Emergency Strategy Snapshot

Area	Key Action	Budget Estimate
Feed access	Feed purchase subsidies	€35–50M
Income protection	Soft loans & market tools	€20M
Food supply continuity	Import smoothing & product buying	€5–10M
Recovery support	Pasture reseeding grants	€20–25M
Total	**Multisector crisis package**	**€80–105M**

Outcome if Implemented

> Prevents mass destocking, stabilizes milk/meat supply, and protects income.
> Provides time to transition toward long-term adaptation (e.g., forage diversification, water retention).
> Ensures continued availability of domestically produced animal products at stable prices.

Emergency policy brief and a financial risk model

Background

In 2026, a high-probability scenario anticipates a sudden and severe drought impacting key forage crops—particularly clover and alfalfa—across the Czech Republic. These crops are critical for the nutrition and productivity of approximately 9,000 livestock farms, which represent 34.6% of all farms and manage 23.8% of national agricultural land. Without intervention, the drought will reduce feed availability, destabilize milk and meat supply chains, and threaten national food security.

Anticipated Impacts

> Clover and alfalfa yield losses: –30% to –60%
> Emergency feed cost increase per farm: €7,000–€12,000
> Livestock output reduction: 10–25% in milk/meat
> National farm income loss: €100–150 million
> High risk of herd downsizing or liquidation

Immediate Policy Objectives

1. Prevent herd reduction and supply chain disruption.
2. Stabilize farm income and avoid bankruptcies.
3. Ensure availability of animal products in national markets.

Proposed Emergency Measures

1. Feed Purchase Subsidies
> Subsidize up to 70% of emergency feed costs.
> Target: 9,000 livestock farms
> Budget: €35–50 million

2. Crisis Credit Line
> Provide soft loans (0–1%) with 12–24 month terms.
> Backed by government and EIB guarantees.
> Budget: €20 million credit facility

3. Forage Import Facilitation
> Temporarily waive tariffs and streamline logistics.
> Bilateral agreements with Austria, Slovakia, Germany.
> Cost: Regulatory; minimal budgetary impact

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4. Market Stabilization Measures

> Public procurement of dairy and meat for food aid programs.
> Trigger CAP Article 219 for intervention buying.
> Budget: €5–10 million

5. Autumn Reseeding Support (Recovery Phase)

> 70% grant for reseeding failed pastures (250,000 ha).
> Launch recovery program in September 2026.
> Budget: €20–25 million

Total Emergency Package

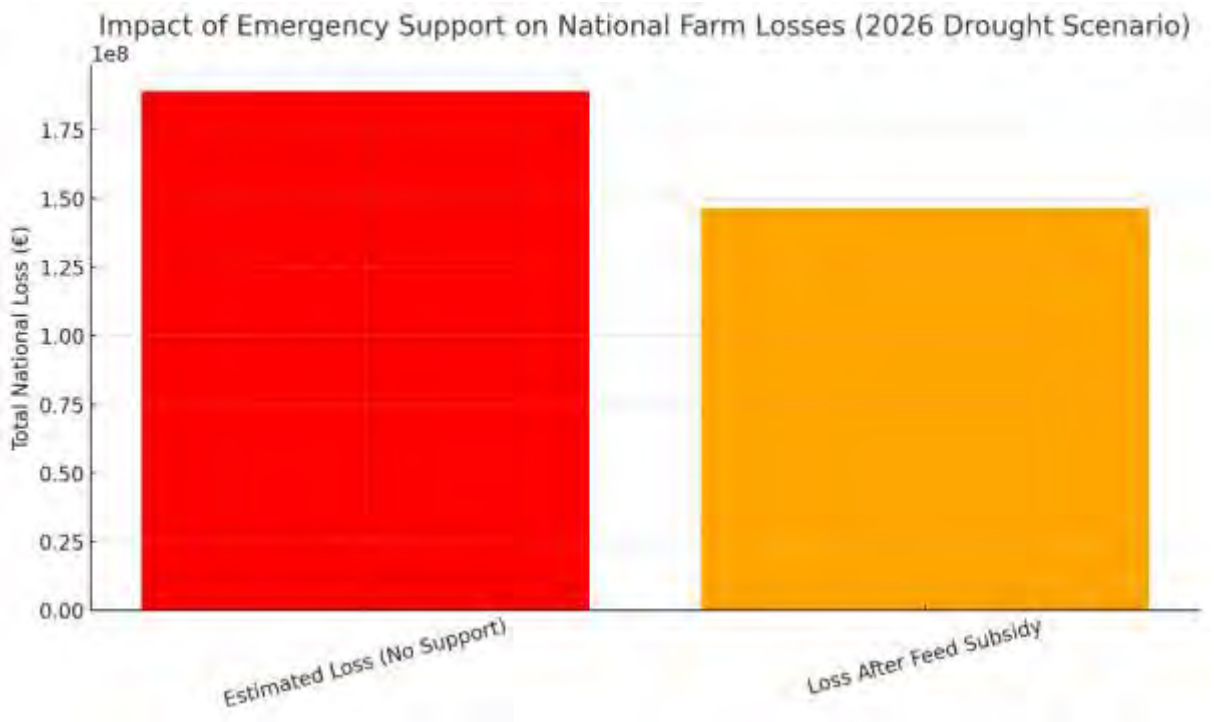
> Estimated Budget: €80–105 million
> Timeframe: July 2025 – October 2026
> Lead Agency: Ministry of Agriculture (MoA)
> Delivery Mechanism: SZIF via CAP emergency funds, RDP reserves
> Partners: EIB, EU Commission (DG AGRI), farmer cooperatives

Expected Outcomes

> Avoids loss of 30–40% of national forage base
> Preserves livestock herds and stabilizes animal product prices
> Prevents income collapse for ~9,000 farms
> Reduces pressure on food imports and trade balance

Financial riksk model

Financial risk model showing how public support measures—particularly feed subsidies—can significantly reduce national farm income losses during a sudden drought.



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Part 2: Market risks

9. Market disruptions and climate change

Market disruptions in the Czech Republic that affect farm production are a hazard, policy should deal with

Market disruptions in the Czech Republic that affect farm production can be considered a hazard that agricultural policy should address—especially in the context of risk management, food security, and rural development.

Why Market Disruptions Qualify as a Policy-Relevant Hazard:

1. **Economic Vulnerability of Farms**
   Czech farms—particularly small and medium-sized ones—are often financially vulnerable. Disruptions in demand, price volatility, or supply chain failures (e.g. export bans, input cost surges) can threaten their viability.
2. **Systemic Impact on Food Supply**
   Disruptions can ripple through the entire food chain, affecting food availability, prices, and ultimately food security, especially if Czech producers scale down or exit the market.
3. **Precedents in EU Policy**
   The EU's Common Agricultural Policy (CAP) recognizes market-related risks (e.g., price volatility, trade shocks) as hazards under Pillar II (rural development), where risk management tools are promoted.
4. **Climate-Economic Interaction**
   Market disruptions can interact with other hazards (e.g. drought + fertilizer price spike), making farm operations unmanageable without public support.

What Policy Can Do:

> Early warning and monitoring systems for market disruptions (prices, input availability).
> Income stabilization tools (e.g. crop insurance, mutual funds, safety nets).
> Diversification and local market access support to make farms more resilient.
> Strategic reserves or emergency procurement in case of systemic collapse.
> Training and advisory services to help farmers navigate volatility.

Conclusion:

Market disruptions affecting farm production in the Czech Republic should be considered a hazard for policy planning. Addressing them proactively aligns with EU frameworks and supports the long-term sustainability and resilience of Czech agriculture.

Most probable and severe market disruptions

To prioritize market disruptions that agricultural policy in the Czech Republic should address, we can assess them based on two key criteria:

> Probability (likelihood of occurrence)
> Severity (impact on farm production, rural livelihoods, and food security)

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Overview

1. Input Price Shocks (e.g. fertilizers, energy, fuel)

> Probability: High
> Severity: High
> Why: Czech farms are highly dependent on imported inputs. Volatile global energy prices or geopolitical disruptions (e.g., war in Ukraine) can cause fertilizer or fuel price spikes, severely affecting production costs and profitability.
> Priority Actions: Input subsidies, hedging mechanisms, support for organic/low-input systems.

2. Supply Chain Disruptions (e.g. transport/logistics breakdowns)

> Probability: Medium–High
> Severity: High
> Why: During COVID-19 and energy crises, transport bottlenecks and labor shortages (e.g. seasonal workers) affected food processing and distribution. Rural infrastructure in Czechia can be a vulnerability point.
> Priority Actions: Regional logistics hubs, decentralized processing, local market access support.

3. Market Access Collapse (e.g. export bans, trade restrictions, embargoes)

> Probability: Medium
> Severity: High for certain sectors
> Why: Czech agriculture exports meat, milk, and cereals. Sudden loss of export markets (e.g., due to sanctions, EU regulatory changes, or demand shifts) can collapse prices and income.
> Priority Actions: Market diversification, local food procurement, trade risk monitoring.

4. Price Volatility in Agricultural Products

> Probability: High
> Severity: Moderate–High
> Why: Global commodity markets are increasingly volatile. For Czech producers, volatile prices (milk, pork, grain) create income instability and discourage investment.
> Priority Actions: Income stabilization tools, forward contracts, cooperative marketing.

5. Retail Power Concentration / Unfair Trading Practices

> Probability: High
> Severity: Moderate
> Why: Large retailers dominate the Czech food market and can impose conditions (e.g. low farmgate prices, short contracts) that undermine producer viability.
> Priorities: Enforce EU directive on unfair trading practices, support short food chains.

6. Labor Market Shocks (e.g. shortage of seasonal/migrant workers)

> Probability: Medium
> Severity: Moderate
> Why: Czech farms rely on seasonal migrant labor, especially for horticulture. Visa policies or pandemics can limit access.
> Priorities: Mechanization support, legal migration programs, training programs for locals.

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Summary: Top Priority Market Disruptions

Disruption	Probability	Severity	Priority
Input price shocks	High	High	🔴 Very High
Supply chain/logistics failures	Med–High	High	🔴 Very High
Export market loss/trade shifts	Medium	High	🔴 Very High
Product price volatility	High	Moderate	🟠 High
Retail buyer power issues	High	Moderate	🟠 High
Labor availability disruptions	Medium	Moderate	🟡 Medium

Top priority market disruptions linked to climate change issues

Several of the top-priority market disruptions in Czech agriculture are closely linked to climate change, either directly or indirectly.

Overview

1. Input Price Shocks (Fertilizers, Energy, Fuel)

> Climate Link:
- Climate-driven droughts and extreme weather can increase global demand for fertilizers, pushing prices up.
- Climate policies (e.g. carbon pricing, emissions caps) may raise the cost of energy-intensive inputs like synthetic nitrogen.

> Example: Fertilizer price spikes following energy market disruptions and droughts in exporting countries.

> Linked to climate change? → Yes, indirectly (via climate policies and extreme weather).

2. Supply Chain Disruptions

> Climate Link:
- Extreme weather events (floods, storms, heatwaves) can damage transport infrastructure, storage facilities, or processing capacity.
- Seasonal weather unpredictability also disrupts harvest and delivery timing.

> Example: Heatwaves halting truck transport due to road damage or overheating regulations.

> Linked to climate change? → Yes, directly (through extreme events).

3. Export Market Collapse / Trade Disruptions

> Climate Link:
- Climate-induced production shifts (e.g. lower yields or food insecurity abroad) can trigger trade protectionism, disrupting Czech exports.
- EU or global climate standards (e.g. carbon border taxes) may affect trade competitiveness.

> Example: A drought in southern Europe causing bans on grain exports to preserve domestic food supply.

> Linked to climate change? → Yes, indirectly (via global food system stress or policy).

4. Price Volatility in Agricultural Products

> Climate Link:
- Weather extremes affect harvest volumes globally, causing supply shocks that drive price spikes or drops.
- Climate variability increases yield unpredictability, especially in open-field crops (grains, vegetables).

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> Example: Global wheat prices spike due to droughts in multiple grain-exporting countries.
> Linked to climate change? → Yes, directly.

5. Retail Power and Unfair Trading Practices

> Climate Link:
  - Not primarily driven by climate, but climate-induced farm losses can weaken farmer negotiating power, making them more vulnerable to retail pressures.

> Linked to climate change? → Indirectly.

6. Labor Availability Disruptions

> Climate Link:
  - Climate impacts in labor-supplying countries (e.g. floods in Ukraine or Moldova) can reduce the pool of available seasonal workers.
  - Heatwaves also reduce **safe working hours**, making agriculture less attractive or feasible.

> Linked to climate change? → Yes, indirectly.

Summary Table: Climate Linkages

Disruption	Linked to Climate Change?	Type of Link
Input price shocks	Yes	Indirect (policy, demand)
Supply chain/logistics failures	Yes	Direct (extreme events)
Export market/trade disruptions	Yes	Indirect (policy, global shocks)
Price volatility	Yes	Direct (weather-driven)
Retail buyer pressure	Partial	Indirect (amplified by farm losses)
Labor shortages	Yes	Indirect (climate in labor source countries, heat stress)

10. Effects of market disruptions

Risk Assessment Matrix for Supply Chain and Logistics Failures

Risk Assessment Matrix for Supply Chain and Logistics Failures in Czech agriculture, categorized by disruption type, evaluated by Probability and Impact, and including Mitigation Priorities.

Supply Chain Risk Assessment Matrix

	Risk Type	Probability (1-5)	Severity (1-5)	Risk Score	Risk Level
1	Transport disruptions	4	5	20	Critical
2	Storage/processing bottlenecks	3	4	12	High
3	Labor shortages in logistics	3	3	9	Medium
4	Input delivery failures	4	4	16	High

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Legend:

- 🔴 Very High Risk → Needs urgent and systemic policy action
- 🟠 High Risk → Should be integrated into near-term policy planning
- 🟡 Moderate Risk → Monitor and address through adaptive measures

Detailed Supply Chain and Logistics Risk Assessment Matrix – Czech Agriculture

Risk Type	Description	Probability	Impact on Farms	Impact on Consumers	Overall Risk Level	Mitigation Priority
Transport Disruption (weather-related)	Roads impassable from floods, snow, heatwaves	High	High	Medium–High	🔴 **Very High**	Upgrade rural roads, climate-resilient infrastructure
Cold Chain Failure (heatwave or outage)	Lack of refrigeration during extreme temperatures or energy shortages	Medium–High	High (postharvest loss)	High (spoiled products, shortages)	🔴 **Very High**	Decentralized cold storage, renewable backup systems
Input Delivery Delay	Seeds, fertilizers, or equipment arrive late due to global or local issues	Medium	Medium–High	Low (indirect)	🟠 **High**	Local input reserves, predictive procurement systems
Processing Bottlenecks	Processors can't handle volumes due to energy or labor shortages	Medium	High	Medium	🟠 **High**	Energy-efficient equipment, distributed processing
Labor Shortages in Logistics	Lack of drivers, packers, or seasonal workers for handling and delivery	Medium	Medium	Medium	🟠 **High**	Worker visa reform, training & mechanization support
Border/Export Delays	Delays at customs or international crossings (non-climate but systemic risk)	Medium	Medium	Low	🟡 **Moderate**	Trade route diversification, advance customs protocols

Top Mitigation Priorities Identified

> Climate-proof logistics infrastructure (flood- and heat-resistant roads and bridges)
> Cold chain decentralization for perishable foods (esp. vegetables, dairy, meat)
> Flexible transport and delivery systems at farm and regional level
> Emergency planning for extreme weather disruptions
> Resilient input supply chains (regional stocks, supplier diversification)

11. Contingency planning

Contingency plan for reducing high level risks

Contingency Plan focused on reducing the two very high-level risks in Czech agriculture related to supply chain and logistics failures:

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Focus Risks:

1. Transport Disruption from Extreme Weather
2. Cold Chain Failure (from heatwaves or energy outages)

Transport disruption from extreme weather

Risk Overview:

> Roads blocked or damaged due to floods, heatwaves (melting asphalt), snow, or landslides.
> Delays in moving inputs to farms and fresh produce to markets.

Contingency Actions

A. Prevention / Preparedness

Action	Description	Responsible Party	Timeline
Risk mapping of critical farm–market routes	Identify vulnerable rural roads and bridges	Ministry of Transport + Agriculture	Year-round
Upgrade critical transport infrastructure	Flood-resistant bridges, heat-tolerant surfaces	Regional gov'ts + EU funding	1–3 years
Pre-position regional emergency transport hubs	Mobile loading zones and backup vehicles	Agricultural Chambers	Seasonal
Promote on-farm storage for buffer stock	Silos or cooling containers to delay shipping	Farmers + Rural Dev. Funds	Annual

B. Response

Action	Description	Responsible Party
Activate emergency farm logistics task force	Coordinate rerouting, bulk pickups	Crisis Response Unit
Deploy temporary or alternate routes	Use forestry roads, rail or regional backups	Local infrastructure agencies
Publicize disruption maps and alerts	Real-time web/app updates for producers	Agricultural Info Service

C. Recovery

Action	Description	Responsible Party
Fast-track repairs to farm routes	Prioritize food-supply-relevant areas	Ministry of Transport
Recovery grants for delayed harvest losses	Compensation fund for perishable crop losses	State Aid Agency

Cold chain failure during heat or power outrage

Risk Overview:

> Milk, meat, leafy greens, herbs, and berries spoiled due to refrigeration breakdowns.
> Power grid instability in rural areas during summer peaks.

Contingency Actions

A. Prevention / Preparedness

Action	Description	Responsible Party	Timeline
Install solar-backed cold rooms	Co-funded decentralized storage at farm or village level	Ministry of Agriculture + EU CAP	1–2 years
Mandate cold-chain risk audits for processors	Evaluate backup systems and vulnerabilities	Food Safety Authority	Annual
Encourage on-farm cold transport investment	Grants for refrigerated vans, cooling boxes	Rural Development Fund	Rolling

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B. Response

Action	Description	Responsible Party
Deploy mobile cold storage units	Rental or military-grade units in affected zones	Emergency Food Logistics Agency
Prioritize food chain for emergency power	Ensure processors and depots are on protected grids	Energy Ministry + Utility companies
Activate emergency food redirection protocol	Reroute fresh food to nearby cold facilities or food banks	National Food Agency

C. Recovery

Action	Description	Responsible Party
Compensation for spoiled goods	Fast-track insurance or emergency payouts	Agri Insurance Fund
Post-event resilience audits	Review and improve weak points in cold chain	Farm Logistics Unit + local co-ops

Cross-Cutting Support Measures

Action	Benefit	Lead Agency
Integrated weather-logistics forecasting	Early alerts for rerouting, power demand	National Meteorological Institute
Training for farmers and co-ops	Teach cold-chain management and contingency use	Ag Extension Services
Emergency communication platform (web/app)	Centralized dashboard for disruptions and support	Ministry of Agriculture

Timeline Summary

Phase	Key Actions
Short-term (0–12 months)	Mapping, training, emergency response protocols, backup routes
Medium-term (1–3 years)	Infrastructure upgrades, decentralized cold storage, backup power
Long-term (3–5 years)	System-wide resilience investments, climate-proof transport network

12. Actor engagement

Actors and monetary consequences

Contingency Plan Action Matrix with

> Activities assigned to responsible actors

> Estimated costs in monetary terms (Czech Koruna, CZK and Euro equivalents)

> Timeframes for implementation

Focus Areas

1. Transport Disruption | 2. Cold Chain Failure

Currency

€1 ≈ CZK 25

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Transport disruption from extreme weather

Activity	Lead Actors	Estimated Cost (CZK / €)	Timeframe	Funding Sources
A1. Risk mapping of rural transport routes	Ministry of Transport, Institute for Spatial Planning	CZK 50 million (€2M)	Year 1	National budget + EU TA
A2. Upgrade priority roads & bridges	Regional Governments, Road Authority, EU Structural Funds	CZK 2.5 billion (€100M) over 3 years	2025–2028	EU Cohesion Funds, State Infrastructure Fund
A3. Establish mobile logistics hubs	State Material Reserves + Agri Co-ops	CZK 100 million (€4M)	Year 2	Rural Development Program
A4. On-farm storage grants	Ministry of Agriculture, State Agricultural Intervention Fund (SZIF)	CZK 300 million (€12M)	Rolling	CAP Pillar II
A5. Emergency transport task force and app	Ministry of Agriculture, AgriChamber, app developers	CZK 30 million (€1.2M)	Year 1–2	State digitalization funds

Cold chain failure

Activity	Lead Actors	Estimated Cost (CZK / €)	Timeframe	Funding Sources
B1. Install solar-backed cold rooms (pilot 500 farms)	Farmers, Rural Development Agency	CZK 500 million (€20M)	2025–2027	CAP + Modernization Fund
B2. Conduct cold-chain audits (processors & large farms)	Food Safety Authority, Private Consultants	CZK 25 million (€1M)	2025	National food safety budget
B3. Refrigerated transport grant scheme	SZIF, Regional Agencies	CZK 200 million (€8M)	Rolling	Rural Development Program
B4. Deploy mobile cold storage (20 regional units)	State Material Reserves, Fire Rescue Logistics	CZK 80 million (€3.2M)	Year 2	Crisis Reserve + EU Civil Protection Mechanism
B5. Emergency electricity priority plan	Energy Ministry + Grid Operator (ČEPS)	CZK 20 million (€0.8M)	Year 1	State Energy Security Fund

Cross-cutting actions

Activity	Lead Actors	Cost (CZK / €)	Timeframe	Funding
C1. Integrated agri-logistics forecast system	Czech Hydrometeorological Institute + AgriChamber	CZK 40 million (€1.6M)	2025–2026	Research/innovation grants
C2. Farmer training on emergency logistics and cold chain	Agricultural Extension Services	CZK 15 million (€0.6M)	Rolling	CAP Pillar II
C3. Post-event audits and resilience monitoring	Ministry of Agriculture + SAIF	CZK 10 million (€0.4M)	2026–2027	State evaluation funds

Total Estimated 3-Year Budget:

> Transport Disruption Measures: CZK 2.98 billion (€119 million)
> Cold Chain Measures: CZK 825 million (€33 million)
> Cross-Cutting Measures: CZK 65 million (€2.6 million)
> Grand Total: CZK 3.87 billion (€155 million)

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Primary Funding Sources

> EU CAP Pillar II (Rural Development)
> EU Cohesion and Recovery Funds
> Czech State Infrastructure & Energy Security Funds
> EU Modernization Fund & Civil Protection Mechanism
> Private co-financing (esp. equipment and on-farm upgrades)

13. Coordination

Coordination scheme and necessary funds

To ensure successful implementation of contingency measures for transport disruption and cold chain failure in Czech agriculture, a robust coordination scheme is essential.

Goal

To ensure efficient planning, implementation, crisis response, and monitoring of logistics-related disruptions through a coordinated, multi-level governance structure.

I. Structure of coordination

Lead Body: Agricultural Logistics Coordination Council (ALCC)
A permanent inter-ministerial and multi-stakeholder task force.

Component	Role
Chair	Ministry of Agriculture (MoA)
Co-Chairs	Ministry of Transport, Ministry of Industry & Trade
Core Members	Czech Hydrometeorological Institute, ČEPS (Grid), Fire Rescue Service, State Material Reserves, Agricultural Chamber, SZIF
Observers/Advisors	EU DG AGRI (CAP), National Food Council, academic experts, key producer groups

Operational Units

Unit Name	Function	Host Institution
Resilient Logistics Planning Unit (RLPU)	Technical planning, data modeling, infrastructure needs	MoA + Czech Technical University
Emergency Agri-Logistics Task Force (EALT)	Crisis deployment, rerouting, cold storage mobilization	State Material Reserves + Fire Rescue
Agri Supply Chain Monitoring Unit (ASCMU)	Live data, forecasts, input/output bottleneck early warning	AgriChamber + Private logistics platforms
Farmer Support Coordination Cell (FSCC)	Single point for farmers to report problems & get info	SZIF + Regional Ag Advisory Offices

II. COORDINATION MECHANISMS

Mechanism	Description	Frequency
Quarterly ALCC Coordination Meeting	Strategic planning, status review	Every 3 months
Biannual Risk Simulation Exercise	Table-top simulation of major logistics disruption	Twice per year
Real-Time Alert Platform (web + app)	Live communication between authorities, farmers, suppliers	Continuous
Annual Evaluation Report	Independent review of preparedness and past-year performance	Yearly

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III. COORDINATION BUDGET (3-Year Plan)

Budget Line	Cost Estimate (CZK / €)	Notes
Secretariat & Council (staffing, admin)	CZK 45 million (€1.8M)	5–7 staff, coordination hub at MoA
Technical Planning Unit (RLPU)	CZK 60 million (€2.4M)	Includes modeling, GIS, software tools
Emergency Task Force & Logistics Training	CZK 50 million (€2M)	Vehicles, drills, mobile equipment use
Monitoring & Alert Platform	CZK 30 million (€1.2M)	Software build, maintenance, hosting
Communication, Farmer Helpdesk & Support Cell	CZK 25 million (€1M)	Outreach, hotline, advisory linkage
Evaluation & Simulation Exercises	CZK 20 million (€0.8M)	Includes external evaluators, workshops

Total Coordination Budget (2025–2027):
CZK 230 million (€9.2 million)

IV. FUNDING SOURCES FOR COORDINATION

Source	Allocation Focus
CAP Technical Assistance (TA)	ALCC operation, planning tools, M&E
National Budget – Agriculture	Farmer support cell, communications
EU Recovery and Resilience Facility (RRF)	Crisis readiness, IT systems
Civil Protection Fund	Simulation training, emergency drills
Private Partners / In-kind	Data platforms, logistics companies

V. BENEFITS OF THIS SCHEME

> Clear command structure and division of labor
> Fast information sharing across ministries and regions
> Proactive use of forecasts and real-time data
> One-stop support for producers during disruption
> Transparent monitoring and learning from disruptions

Concept note for EU or donor funding

Concept Note tailored for EU or donor funding (e.g. through the EU CAP Technical Assistance, EU Recovery and Resilience Facility, or international climate adaptation funds).

1. Background and Rationale

Czech agriculture faces increasing risk from supply chain and logistics failures, driven by:

> Climate change impacts (floods, heatwaves, and snowstorms)
> Energy volatility and cold chain breakdowns
> Global trade disruptions and labor shortages

Perishable products (milk, vegetables, berries, leafy greens) are especially vulnerable to cold chain failures and road inaccessibility. Without coordinated planning and emergency response, these disruptions can lead to economic losses, food waste, and market instability. A structured, cross-sectoral coordination platform is essential to ensure agricultural resilience, safeguard food security, and align Czech responses with the EU's Farm to Fork and Climate Adaptation strategies.

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2. Objectives

> Establish a **national coordination mechanism** for agro-logistics risk and disruption management.
> Build and operate a **real-time information platform** for farmers, processors, and authorities.
> Improve **preparedness, infrastructure response, and communication** for weather-induced and energy-related disruptions.
> Support farmer access to emergency logistics and **cold chain infrastructure**.

3. Project Components

Component 1: Coordination Governance
> Set up the Agricultural Logistics Coordination Council (ALCC).
> Develop governance rules, crisis protocols, and regional liaisons.

Component 2: Technical and Emergency Planning
> Create the Resilient Logistics Planning Unit to map vulnerabilities and simulate risk scenarios.
> Develop risk-informed routing, storage, and delivery plans.

Component 3: Real-Time Monitoring & Communication Platform
> Build an integrated web and mobile alert platform to share real-time supply chain disruptions and transport issues.
> Integrate with Czech Hydrometeorological Institute and energy grid forecasts.

Component 4: Farmer Support and Advisory Services
> Operate a farmer logistics helpdesk linked to emergency response.
> Disseminate good practices on storage, transport, and emergency planning.

Component 5: Evaluation and Simulation
> Conduct biannual simulation exercises with government and private actors.
>Publish an annual resilience report.

4. Expected Results and Outcomes

Result	Indicators
Coordinated national logistics response system operational	ALCC functional with regular meetings
Farmers receive real-time logistics alerts	Platform launched; 10,000+ users in 2 years
Increased cold chain resilience in rural areas	20+ emergency mobile units deployed
Strengthened transport emergency protocols	Risk-based maps, response drills conducted
Improved policy integration	Data used in CAP and rural development planning

5. Budget Estimate (3 Years)

Budget Item	CZK	EUR (approx.)
Governance & Secretariat	45,000,000	1.8 million
Technical Planning and Simulations	60,000,000	2.4 million
Real-time Monitoring Platform	30,000,000	1.2 million
Farmer Helpdesk and Training	25,000,000	1.0 million
Emergency Exercises & Evaluation	20,000,000	0.8 million
Total	**CZK 180,000,000**	**€7.2 million**

6. Funding Sources Sought

Source	Role
EU CAP Technical Assistance	Core coordination, governance, and evaluation
EU Recovery and Resilience Facility	Infrastructure support, digital platforms
EU Civil Protection Mechanism	Crisis logistics and emergency drills
Donor (e.g. FAO, GIZ, EIB)	Technical expertise, resilience design
Czech Government (co-financing)	Operating costs and national staffing

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7. Lead Applicant and Partners

> Lead: Ministry of Agriculture of the Czech Republic
> Co-Applicants: Ministry of Transport, State Material Reserves, Czech Hydrometeorological Institute, Agricultural Chamber
> Implementation Partners: Regional Governments, SZIF, Agricultural Advisory Network, private logistics operators, technology providers

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