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Options for developing an agricultural insurance policy for Iceland

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Summary

This policy brief gives advice to the Icelandic Ministry of Food, Agriculture and Fisheries on the development of an agricultural insurance policy. With respect to an effective coverage there is no unique risk management model that meets the needs and situations of all farmers in Iceland. A generic portfolio of risk management instruments to protect farmers against shallow and deep losses could include:

- On-farm or household level protection against normal risks (shallow losses, farm retention layer 1) using public supported precautionary savings to complement traditional non-financial on-farm risk management strategies (e.g., agronomic practices as diversification) or off-farm income sources.
- Off-farm risk transfer of deep risks through premium subsidies for agricultural insurance to address in-between risks (risk retention layer 2).
- Ad-hoc disaster relief for catastrophic risks to support recover from natural disasters, provided under strict conditions (market failure layer 3).

Public supported precautionary savings require the following subsequent actions:

- Determine fiscal and legal opportunities (pre-tax provision as a fiscal policy) as well as whether there is political support to facilitate public supported precautionary savings (i.e., allocated annual budget for matching farmers deposits by reallocating current agricultural support programmes).
- Eliciting willingness to deposit savings on (pre-tax) precautionary savings bank account by farmers.
- Co-develop terms and conditions—such as maximum deposit limits and withdrawal criteria under adverse conditions—through collaboration between farmers, banks, and the ministry.

Insurance coverage for those perils not yet insurable is unlikely to materialise without public support. The following stepwise insurance actions and role of the government are relevant to consider:

- Determine whether there is political support for subsidising agricultural insurance (i.e., prioritise perils and reallocate funds from existing agricultural support programmes to finance premium subsidies).
- Eliciting willingness to pay for insurance by farmers.
- Backward engineer a viable insurance coverage by a co-creation design process involving farmers, insurers and the ministry.

Ad-hoc disaster relief actions:

- Define objective criteria for disaster relief support, i.e., which events are eligible and when are pay-outs triggered (e.g., double hurdle approach by using weather indexes as a first hurdle, and subsequently applying a threshold of appraised losses).
- Both for insurance payouts and disaster relief compensation, facilitate loss appraisal by means of value tables agreed with the various agricultural sectors through consultations with the stakeholders. Update these value tables on an annual basis using the latest market prices (and average yields) to ensure the tables reflect the actual prices (and trends in yields). Since these tables serve as guidelines, valuers can deviate from them when they deem it necessary.

Introduction

In recent years, there has been increased attention to insurance schemes in the Icelandic agriculture sector, mainly due to recent crises (e.g. Covid-19, the war in Ukraine, volcanic activity) and unexpected weather events, such as an unusually cold winter season causing crop yield losses and excessive rain, causing landslides. Repeated ad-hoc disaster relief interventions have been triggered by the government to support the sector in the occurrence of these unforeseen events or crises. A recent report by the Working Group on Farmers Insurance in Iceland (2022) concluded that the current insurance system in Iceland is complex, while coverage is limited. In light of the forthcoming reform of the current Icelandic agricultural support system, which ends in 2026, the Icelandic Ministry of Food, Agriculture and Fisheries has invited Wageningen Social & Economic Research to give advice with regards the development of an agricultural insurance policy in Iceland. This policy brief will serve as a starting point for the discussions with relevant stakeholders for the government in Iceland. The policy brief is structured around the following six questions, which have been formulated by the Icelandic Ministry of Food, Agriculture and Fisheries (henceforth referred to as 'the ministry'):

1. Are there any success stories or pitfalls in developing agricultural insurance that could be pointed out?
2. What are the general preconditions for developing an agricultural insurance policy, for example, in terms of data or any other aspects that might be required?
3. What are the most important points to consider in preparing an agricultural insurance policy?
4. Is it realistic to develop a subsidised private indemnity insurance in cooperation with the market?
5. Is it practical to develop a general framework of support, e.g., a framework where conditions are listed where the farmers are eligible for support after adverse weather events?
6. In case it is not possible to develop a new insurance system and Iceland continues to resort to ad-hoc measures requiring additional funding every time, are there any policy recommendations that could be pointed out or structural changes the ministry could make in its current support system that could be helpful in dealing with situations like extreme weather events?

The above questions have been answered by exploiting existing literature in combination with expert knowledge. This policy brief builds on the report published by the Working Group on Farmers Insurance in Iceland published in 2022.

Scope and background of risk financing in Icelandic agriculture

According to the latest figures from 2023, there are approximately 2,500 farms in Iceland producing various kinds of agricultural products with a combined turnover of 600 million euros (Statistics Iceland, 2025). Icelandic agriculture is dominated by livestock production (predominantly sheep and dairy cattle), with livestock accounting for roughly 65% of all Icelandic agricultural production (Statistics Iceland, 2024). According to official statistics, Iceland counted 355,723 sheep, 78,493 cattle, and 49,596 horses in 2023 (Ministry of Food, Agriculture and Fisheries, 2024). The main crops are hay and cereals for animal feed and vegetables; the latter are cultivated primarily in greenhouses heated through geothermal energy.

The level of financial support for Icelandic farmers is among the highest in the world. In 2022, an estimated 175 million euros in government financial support was allocated to Icelandic farmers (OECD, 2023).[1] Most Icelandic agricultural support to farmers continues to be provided through market price support measures, principally through high tariffs that help to maintain high domestic prices relative to global prices, while direct payments to farmers are mostly based on coupled support. In 2020-2022, the Producer Support Estimate (PSE) was at 50%, meaning that half of Icelandic farmers gross receipts are linked to monetary transfers from consumers and taxpayers, arising from policy measures (OECD, 2023). It is the second highest of all OECD countries after Norway. The level of producer support varies greatly between sectors; dairy, sheep and horticulture rely on direct farm payments, but poultry and pigs rely on market price support (i.e., tariffs).

Iceland does not have a comprehensive, nationwide agricultural insurance policy like those in many other countries (see next chapter). However, Iceland does have a Disaster Relief Fund in place (in Icelandic: Bjargráðasjóður; abbreviated Bj sj.),[2] a government-owned institution, whose role is to provide individuals and companies with financial assistance to compensate for major damage caused by natural disasters (laid down in Regulation 1111/2023 on the Disaster Relief Fund). The Disaster Relief Fund is operated with direct financial contributions from the state treasury and is managed by the Icelandic Natural Disaster Insurance (NTI) Fund. At the end of 2024, the total size of the Fund was 1.65 million euros, while the State contributes 55,000 euros annually to the Fund. In the past, this fund has been deployed for multiple events such as frost damage to cultivated land, volcanic eruptions, and landslides, to support affected farmers. Most recently, the Fund allocated nearly 225 million Icelandic króna (1.5 million euros) in grants to 89 farmers affected by the unusually cold 2023/2024 winter season in northern Iceland (RÚV, 2025).

The parties most involved in the insurance coverage of farmers are the Icelandic Natural Disaster Insurance (NTI) and the general insurance companies (Sjóvá, TM, VÍS and Vörður). Table 1 summarises what is covered by insurance schemes available to farmers in Iceland and where there are gaps.

Table 1 *Insurance coverage available or disaster relief fund*

		Item/sector				
		Buildings and machinery (incl. greenhouses)	**Fences**	**Livestock**	**Field crops**	**Greenhouse crops**
	Covered by:					
Natural disasters						
Earthquakes/volcanic eruptions/avalanche/landslide/flooding	NTI		Bj.sj.			
Flood due to a landslide or snowfall/storm/water damage due to leaks from pipes/wildfires/lightning/fire (other than wildfire)	Insurance companies		Bj. Sj.	No coverage for floods due to a landslide or snowfall		
Hail/frost/drought/extreme cold					Bj. Sj.	
Fire damage (other than wildfires	Insurance companies		Bj. Sj.			
Diseases						
Infectious diseases/epidemics				Partially selective		
Plant diseases						
		Covered				
		Partly covered				
		No coverage				
		No damage susceptibility				

Source: Based on the information reported by the Working Group on Farmers' Insurance in Iceland 2022.

The mapping shows that insurance coverage for structures is relatively well established; buildings are compulsorily insured against both fire and natural disasters (e.g., mudflows). However, they must be insured specifically against floods and storms. On the other hand, insurance coverage for

[1] Based on the average exchange rate between USD and EUR in 2022; 1 USD = 0.951 EUR. Retrieved from: US Dollar to Euro Spot Exchange Rates for 2022

[2] https://island.is/styrkumsokn-bjargradasjodur

machinery against floods and mudflows is limited, available only possibly through a single insurance company. However, this is not considered a serious gap.

The assessment of the Working Group furthermore revealed that crops can be insured up to a certain extent, such as against natural disasters, while the Disaster Relief Fund has also provided farmers with financial assistance in connection with crop failure caused by extreme cold, drought or hail in the past. However, no insurance coverage is available for plant diseases that may affect field crops or greenhouse crops in Iceland, although damage to livestock due to culling is partially compensated if ordered by the authorities. Arable land cannot be insured, but the Disaster Relief Fund has provided financial assistance for damage to arable land. Additionally, farmers may choose to apply for continued coupled payments when production is disrupted by natural disasters. However, this possibility only applies to sectors where those payments are made.

Are there any success stories or pitfalls in developing agricultural insurance that could be pointed out?

To identify any success stories or pitfalls in developing agricultural insurance, we start by providing a high-level international overview of agricultural insurance based on a recent EU mapping study (European Commission, 2023).

In the EU, Member States may grant support for financial contributions to premiums for insurance schemes (or mutual funds) in line with their assessment of needs in their National Strategic Plans (NSP) for the Common Agricultural Policy (CAP). Support is granted only for covering losses which exceed a threshold (i.e., deductible) of at least 20% of the average annual production (or income). Moreover, premium subsidy shall not exceed 70% of the eligible costs. Note that to secure appropriate risk management and preserve farmers' income, Member States may decide to assign up to 3% of the direct payments to be paid to a farmer for their contribution to a risk management tool. These tools are likely to complement or increase the viability of current private and public supported insurance programmes that are already available in several Member States for crops and livestock.

In total, 14 Member States that programmed a risk intervention tool opted to support multi-peril crop insurance (MPCI) and mostly applying a threshold of 20% and premium subsidy of 70%. On average, an estimated 14.5% of farmers in the EU are set to benefit from risk management tools supported from the CAP in the current programming period (2023-2027). Italy and France are the Member States with the largest shares of farmers being targeted by risk management schemes with respectively 95% and 69.5% of farm holdings (and allocating respectively 2.9 billion euros and 949 million euros each to support either insurance schemes or mutual funds).

However, it should be noted that some other Member States have opted for supporting crop insurance for decades by means of national subsidised insurance schemes under state aid rules. A typical example is Spain, which has consolidated its Agroseguro insurance system over 40 years and is one of the most developed ones in the world, as described in its NSP. At present, almost all of the products of interest to the agricultural sector are eligible for insurance against almost all the risks caused by adverse natural events. In the years of higher claims, the agricultural insurance system has provided indemnifications in excess of 700 million euros per year

Only a few Member States rely fully on the private insurance market. A typical example is Germany which has a long history of private based crop insurance with a high uptake of insurance against hail damage (approximately 70% total agricultural area is insured). Only since recently Germany included premium support in its NSP for only a limited number of sectors.

In comparison to crop insurance, sanitary and phytosanitary insurance is much less developed in EU Member States. Member States provide public compensation for direct losses arising from notifiable sanitary and phytosanitary risks, although mutual funds covering these risks exist in a few Member

States. Where they exist, these public-private schemes often have a compulsory funding structure whereby all farmers in one or more sectors must participate. Only in a few Member States have mutual funds been set up on a voluntary basis to compensate for consequential losses (e.g., idle production as is the case in, for example, France). Again, Germany is an exception, with a private livestock insurance with a high participation rate.

In summary, crop insurance has a long history and plays a significant role in compensating yield losses caused by climatic risks in the EU. The tools available in Member States to manage agricultural risk through insurance are very diverse. While Member States can opt for public support under the CAP risk management toolkit, other Member States have chosen national subsidised insurance schemes under the state aid rules and only a few Member States rely on private insurance without public support. Across the EU there is a heterogeneous approach to providing public support for premium or private-based solutions. In more market-orientated Member States, policy makers aim to create conditions for liberalisation. In this context, subsidising agricultural insurance is politically controversial and not considered a step forward. The key principle is that farmers themselves should make risk management decisions in balancing risks and returns.

The success story is Germany, which is to date proof that high participation rates can be achieved by means of a pure private-based crop and livestock insurance (i.e., without subsidy). The success can be partially explained by the long tradition of private-based insurance, insurance-minded culture and a mutual approach. A mutual approach means that farmers are both owners and policyholders of the mutual insurer and are entitled to participate in basic corporate decision-making process through elected representatives in the members' delegates' meeting and the supervisory board. However, this success could not be replicated in any other Member State, and this is in fact the case worldwide.

The main pitfall is that the provision of subsidised insurance could distort optimal farm production decisions (risk transfer by means of insurance versus on-farm risk management via, for example, diversification; see the section on general preconditions for developing an agricultural insurance policy).

What are the general preconditions for developing an agricultural insurance policy, for example, in terms of data or any other aspects that might be required?

Following the OECD definitions (within a holistic framework), agricultural risks are categorised into three distinct layers. The first layer consists of risks that occur frequently and are typically managed by means of on-farm instruments, such as (crop) diversification and adoption of risk-reducing technologies. The second layer entails risky events that are infrequent and idiosyncratic and can more appropriately be managed via different risk transfer instruments, such as private insurance schemes. However, if adverse events are more catastrophic and systemic, the market for insurance can fail (Duncan and Myers, 2000). Thus, the third layer incorporates catastrophic risks, which are events with a low probability of occurrence (i.e., rare events). These events can lead to major and typically irreversible losses, with a potentially adverse impact on more than one region because of their correlation or systemic component. However, events catastrophic for an individual or a small community are not considered in this context. Rarity and severity are typically associated with catastrophic risks: the more severe a risk is, the rarer it generally tends to be, and vice versa (Skees and Barnett, 1996).

Figure 1 provides a visualisation that relates the different risk layers described above, distinguishing the degree to which risks are 'idiosyncratic' or 'systemic', to various types of risk management instruments.

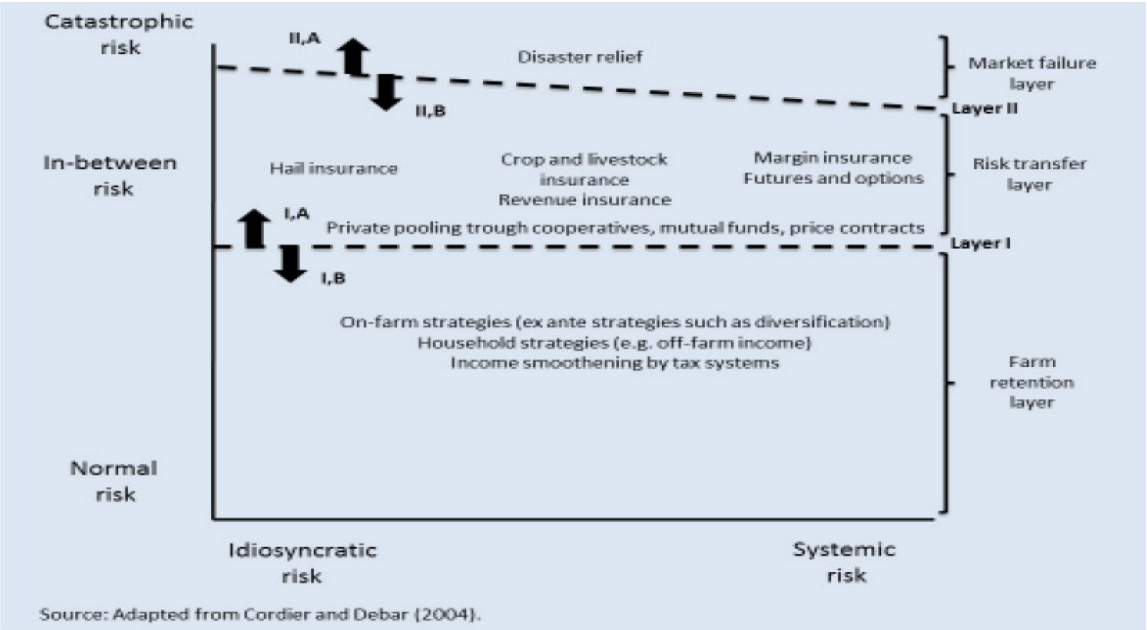

Figure 1 *Mapping risk management instruments*
Source: Study on risk management in EU agriculture (European Commission, 2017).

A general precondition for developing an agricultural insurance policy is a clear delineation of layers (coherence) as described in the study on risk management in EU agriculture (European Commission, 2017). Public policies aimed at risk handling typically focus on two strategies/tools.

The first strategy/tool is to enhance the supply of insurance and to promote insurance markets for risks that are potentially tradable but which have not been developed yet due to market failures and information gaps. These policies seek to expand the layer of marketable risks, and encourage insured parties to share costs, reducing the public sector's sole burden in disaster relief.

A second strategy/tool is to deliver disaster assistance and provide protection against catastrophic risks that are clearly not tradable. Several factors explain why the market fails to protect against catastrophic risks (3rd layer): these include farmers underestimating the catastrophic risks, and the difficulty insurance companies face in providing sufficient reinsurance capacity. Defining what qualifies as a 'catastrophe' and justifying catastrophic assistance is crucial, as the unrestricted use of disaster relief funds could distort the market, shrinking the risk transfer layer (as visualised by movement "II,B" in Figure 1), whereas a more restrictive disaster relief would tend to move it upward (Figure 1: movement "II,A").

What are the most important points to consider in preparing an agriculture insurance policy?

General principles of agricultural insurance
Insurance schemes are typically used to pool risks. The rationale of risk pooling involves combining the risks faced by a large number of individuals who contribute through premiums to a common fund, which is used to cover the losses incurred by any individual in the pool (i.e., the many pay a small amount to compensate the few with large losses). Risks are insurable if certain conditions are met (Skees, 1997; Skees and Barnett, 1999), namely:

- The insurer and the insured have the same information regarding the probability of an adverse outcome (symmetric information). This is usually not the case; the main issues are moral hazard and adverse selection.
- Risks should be independent across insured individuals (idiosyncratic). If risks are systemic (dependent), pooling is hampered and special measures have to be taken to make insurance solutions viable.

- Calculable: To determine the premium rates, the insurance company must be able to calculate the chance of loss (frequency) and the severity of loss. Actual losses occurring must be determinable and measurable.
- Premiums must be affordable for farmers.

As has been mentioned, insurance systems are difficult to apply because asymmetry in information leads to behaviour that undermines the system. There is adverse selection when the level of risk in the insured population is higher than the average (i.e., only people with the highest risks will buy insurance). Moral hazard occurs when the insured has the ability to increase their expected indemnity by actions taken after buying the insurance. It means that farmers covered by insurance might adopt riskier practices than otherwise (i.e., excessive specialisation, production in risky conditions like inappropriate climate or fragile land). However, there are techniques, well known to insurance companies, which limit such behaviours (OECD, 2001). Some examples of a few techniques:

- Deductibles (the insured has to bear part of the loss: a fixed amount or a percentage of the total loss).
- Agreeing on or specifying precautionary measures in the contract to prevent losses, and perform checks to verify whether the insured takes these measures.
- Indemnification based on an objective index which cannot be influenced by the insured (weather index insurance).

Natural disasters and epizootic diseases present unique challenges for insurance. For example, the risk of natural disasters within a specific region is highly correlated among farmers in that area, meaning there is a low likelihood of occurrence but a very high potential for losses. However, several factors make it difficult to create insurance products for such risks (Skees, 1997):

- Without reinsurance or state guarantees, the systemic nature of these risks forces insurance companies to charge high premiums (which are often unaffordable for many farmers) and build substantial capital reserves.
- The infrequent occurrence of such events leads to a lack of historical data, making it difficult to accurately calculate premiums.
- The availability of ad-hoc government disaster payments discourages the development of insurance products by reducing demand.

Like natural disasters, epidemic diseases also have a systemic nature, with outbreaks being infrequent and data limited. In the case of animal diseases, farmers can mitigate risks by taking precautionary measures such as vaccination and veterinary screening, while state involvement is critical, both in terms of legislation and in covering direct losses caused by disease outbreaks. Typically, governments compensate for direct losses, leaving insurance to address consequential or indirect losses. These include losses due to business interruptions (e.g., empty facilities), supply chain and delivery disruptions (due to movement restrictions), and costs related to repopulating herds (Meuwissen et al., 1999a; Meuwissen, 2000).

Points to consider in preparing an agriculture insurance policy

There are a number of key points to consider in preparing an agriculture insurance policy as highlighted by the OECD (2009) report about managing risks in agriculture.

The government plays a crucial role in identifying catastrophic risks and defining the responsibilities of farmers, government agencies, and private entities in managing these risks, whereas enhancing risk awareness and improving farmers' understanding of risk management is generally considered to be another key governmental responsibility. To develop effective policies, the government must categorise different layers of risk, particularly those associated with catastrophic events, and ensure the availability of reliable data for informed decision-making. Agricultural risk functions as an interconnected system where markets and government interventions influence risk exposure and farmers' strategies. While government programmes can support market-based risk management approaches, they must be designed to complement rather than replace private sector initiatives or

on-farm strategies. A well-structured agricultural insurance framework should provide coherent coverage options that protect farmers while fostering market-driven solutions.

Additionally, the government is instrumental in promoting risk-sharing mechanisms such as insurance, futures/options, cooperatives, and mutual funds. This includes identifying insurable risks, encouraging market-based solutions, and addressing gaps where such instruments are absent. Government interventions may involve subsidies through public-private partnerships, ensuring fair competition among insurers, and providing economic performance data. Policies like price support or market interventions can help stabilise price fluctuations, strengthening the overall market structure for risk management tools. In addressing catastrophic risks, the government must define what qualifies as such and establish mechanisms to mitigate their impact. This entails gathering data on past disasters, identifying risks that require disaster aid, and assessing the effectiveness of existing risk management instruments, whereas effective disaster response requires coordination among various agencies and institutions at different levels. Furthermore, the government must set thresholds for intervention and align public and private risk management mechanisms (i.e., coherence), including insurance and disaster aid programmes, to create a comprehensive and responsive policy framework

Effects of decoupled payments on mitigating risk

A possible shift from coupled to decoupled farm payments may alter farmers' risk preferences. Research by Menning and Sauer (2023), which examined the effects of the 2003 CAP decoupling reform on the performance of arable farms in France and the UK, found that farms generally became more productive as a result of decoupling. This is primarily due to economies of scale and the increased use of technological innovations. With decoupled payments, farmers adapt more successfully to what is going on in the market and seize development opportunities. Coupled direct payments, on the other hand, prevent agricultural goods from being produced with the best possible use of resources, research shows. At the same time, since decoupled payments are not tied to the amount produced, they do not incentivise overproduction, unlike traditional subsidies (e.g., price support) that might encourage farmers to produce more than the market demands (often leading to surpluses that depress prices). In general, decoupled direct payments do not directly impact the variability of income, but have a positive impact on the mean level of farm income and as such contribute to making farms more resilient to adverse shocks. Moreover, it can be argued that highly decoupled payments have very limited crowding-out effects on other risk management strategies (European Commission, 2017).

Is it realistic to develop a subsidised private indemnity insurance in cooperation with the market?

The development of a subsidised private insurance scheme has followed three alternative pathways in Europe. These pathways are used as a basis to explore whether it is realistic to develop a subsidised private insurance scheme in Iceland.

The most obvious pathway is to extend existing agricultural insurance coverage. A typical example is the Netherlands, where commercial insurance schemes have been successfully marketed (as in many other Member States) to protect farmers against hail losses for more than a century. In those markets, insurers can provide all types of agricultural and non-agricultural coverage, while others can offer only special, targeted mono-line coverage for farmers. In response to a large-scale disaster relief programme, the objective of the Dutch government was to expand crop insurance (from hail insurance to MPCI) and to shift away from ad-hoc payments. To increase demand for the multi-peril insurance, the premium is subsidised following CAP regulations, thereby exploiting the opportunities of subsidising premiums opened under the EU framework (single peril crop insurance is explicitly excluded from subsidy in the Netherlands). Note that between the objective of shifting away from the disaster relief programme to the start of MPCI, more than a decade passed (from 1998 to 2010).

The second pathway is transforming disaster relief funds into insurance-based solutions. Typical examples are France and Italy, both of which have a long history of compensating farmers for losses due to natural disasters and supporting the development of crop insurance. As the efficiency of these national funds in France and Italy came under debate, both were restructured into public-private insurance schemes. The key policy reform was to reduce direct public ex-post compensation and move closer to market-based solutions (a transition from a national fund to public-private insurance schemes). Ex-post compensation was financially not sustainable, and it was considered that insurance would provide a more immediate indemnification response. The CAP contribution to cover part of the costs is intended to enable farmers to access these instruments at accessible costs, resulting in high adoption rates and foreseen targets.

The third common pathway is typical for Eastern European Member States. Prior to joining the EU, insurance provision was under government control (and compulsory). Over time, a more public-private approach has gradually been established, and these insurance systems continue to evolve.

Independent of the pathway, in extreme situations like Covid-19, the war in Ukraine, highly pathogenic avian influenza (HPAI) and extreme weather events, disaster assistance still has been delivered in some of the aforementioned cases. However, the provision of protection was less frequent with lower budgets than under the circumstances without the insurance-based solutions (i.e., the risk transfer layer was expanded).

Iceland has no history of providing hail (general crop) insurance (or livestock insurance). Moreover, as a remote island with specific climate conditions and a small agricultural market, it is unlikely that Iceland will attract EU-oriented agricultural insurers. This implies that the only way forward, under the condition that this is a policy objective, is to transform current coverages marketed by Icelandic insurance firms (the pathway of transforming disaster relief funds into insurance-based solutions is even more challenging).

Insurance coverage for those perils not yet insurable is unlikely to materialise without public support. A key obstacle is the small number of potential insured farms in Iceland. Not only does the principle that many pay a small amount in premiums to compensate the few with large losses break down, but it also holds only to a limited extent, requiring international reinsurance to broaden the pool. Also, the foreseeable relatively high transaction costs are inherently problematic (i.e., fixed costs of running the insurance scheme).

Premium income must be sufficient to cover losses and expenses. To derive this premium, the insurer estimates projected claims and expenses. The final premium farmers pay is referred to as the gross premium. The gross premium accounts for the payment of losses and a loading to cover the expenses of operation. That part of the rate that is intended to cover losses is referred to as pure premium when expressed in national currency, and as loss ratio when expressed as a fraction (or percentage). The components of the loading is primarily a matter of cost accounting, and the various classes of expenses for which provision must be made, and typically include acquisition, administration, taxes, contingencies (retention and reinsurance) and profit (Vaughan and Vaughan, 1996).

Loss ratios for crop insurance in Europe are typically within the range of 0.60-0.70. Large insurance schemes (covering diverse geographical areas and different environmental zones) are more likely to succeed, while smaller, less diversified schemes are less likely to prosper. With a limited demand (for systemic risks) in a small market, costs are expected to be prohibitive; relatively high costs are incurred to market and upscale (i.e., acquisition costs), to run the back office (administration costs), and to cope with risk and uncertainty (i.e., contingency, by means of retention and reinsurance). Due to the relatively small size of the farming sector in Iceland, as well as its relatively high exposure to natural disasters/weather-related risks, a subsidised private indemnity insurance in cooperation with the market will likely be confronted with low loss ratios. Low loss ratios signal unreasonable costs for farmers, while high subsidy rates are needed to make it attractive.

Despite these obstacles, the following stepwise insurance actions and role of the government are relevant to consider. These actions are derived from the pragmatic actions taken in the Netherlands, which faced a similar challenge. The approach focuses on 'what is feasible' instead of 'what is ideal':

- Determine whether there is political support to subsidise agricultural insurance (i.e., prioritise perils and reallocate funds from existing agricultural support programmes to finance premium subsidies).
- Elicit willingness to pay for insurance by farmers.
- Backward engineer a viable insurance coverage by a co-creation design process involving farmers, insurers and the ministry.

The outcome of this exercise could well be that the transformation is hampered both on the demand side (farmers) and the supply side (insurer). The report by the Working Group on Farmers' Insurance already highlighted the limited appetite among Icelandic farmers and insurers.

Is it practical to develop a general framework of support, e.g., a framework where conditions are listed where the farmers are eligible for support after adverse weather events?

Public payments are effective in achieving disaster relief and are provided by almost all EU Member States. As elaborated on in the study on improving crisis prevention and management criteria and strategies in the agricultural sector (European Commission, 2020), EU Member States follow different regulatory frameworks in defining a crisis situation. The regulations range from detailed ex-ante frameworks to ad-hoc ex-post approaches.

However, disaster assistance programmes have typically been launched ad-hoc and ex-post in Europe. Procedures and compensation levels have often been decided upon under political pressure after an adverse event. However, a more general framework of disaster relief support has the advantage of flexibility for policy-makers.
The more detailed an ex-ante framework becomes, the more it resembles an insurance policy, e.g., a framework that outlines terms and conditions for farmers to be eligible for support in case of adverse weather events. The ex-ante framework of support could include, for example, the following key considerations:

1. Scope of coverage
   - Crop (which crops included)
   - Livestock (which livestock included)
2. Perils covered
   - Natural Disasters (e.g., frost, drought, floods, hail, storms)
   - Pests and Diseases (e.g., insects, fungus, viral outbreaks)
3. Exclusions & Limitations
   - Certain weather events may not be covered
   - Pre-existing diseases in livestock might be excluded
   - Human negligence or improper farm management
4. Sum Insured & Valuation Methods
   - Based on historical yield data for crops
   - Deductible
5. Claim Settlement Process
   - Assessment Methods (on-ground survey, satellite imagery, yield data)
   - Timelines (fast-tracking claim payouts to assist farmers in need)

In summary, whether or not to develop and implement an ex-ante framework or follow an ad-hoc ex-post approach is a political decision. The advantage of a regulatory ex-ante framework is that politicians, farmers and insurers know how risk boundaries are delineated (see general precondition for developing an agricultural insurance policy).

In case it is not possible to develop a new insurance system and Iceland continues to resort to ad-hoc measures requiring additional funding every time, are there any policy recommendations that could be pointed out or structural changes the ministry could make in its current support system that could be helpful in dealing with situations like extreme weather events?

Disaster relief system

As stipulated in previous sections, a delineation of risk boundaries is essential. This question calls for a detailed ex-ante regulatory framework rather than an ad-hoc ex-post approach.

Defining objective criteria for disaster relief support is essential, i.e., which events are eligible and when pay-outs are triggered. Follow a hybrid approach (double hurdle), where predefined specific weather conditions (embedding some elements of a weather index insurance) and a scale element (above a certain amount of loss) trigger payouts. In this way, at least two triggers must be present for the farmer to become eligible for an indemnity payment. First, a specified adverse climatic event must be observed (for example threshold in x mm rainfall in x days to declare it as an excessive rainfall event). Second, the actual crop damages must be at least a certain minimum percentage of a reference output. Based on climate data, the return period of each eligible weather event can be determined, to guide and ensure that only deep risks are covered by the disaster relief programme.

Both insurance payouts and disaster relief compensation facilitate loss appraisal by means of value tables agreed upon with the various agricultural sectors through consultations with the stakeholders. It is necessary to update these value tables on an annual basis using the latest market prices (and average yields) to ensure the tables reflect the actual prices (and trends in yields).

Precautionary savings/tax smoothening

The instrument of precautionary savings (a form of self-insurance), which is provided in Canada but also in Australia and New Zealand (see also van Asseldonk et. al, 2019), can potentially complement the array of risk management tools in Iceland. A farmer's precautionary savings account could be funded by a pre-tax provision as a fiscal policy. For example, under a precautionary savings scheme, producers' own deposits could be matched with contributions from the reallocation of direct payments, with withdrawals permitted under certain conditions based on the difference between actual and expected revenue. Further study and assessment would be needed for exploration of the potential opportunities of such instrument in Iceland.

In Canada, for example, the AgriInvest scheme[3] is designed to help farmers manage (primarily) small income declines often referred to as 'shallow losses'. The scheme operates as a self-managed savings account where farmers can deposit a portion of their income, and the government provides matching contributions to support these deposits. The federal government allows farmers each year to invest 100% of their annual net sales into a tax-free savings account (no income tax is levied on interest), matching producer contributions up to 1% with a maximum annual subsidy of $10,000 (Canadian dollars) (being 1% of $1 million in Allowable Net Sales). Further, producers are permitted to allow their AgriInvest account to reach four times their annual net sales as a safety net to protect against shallow reductions in income, plus some of the deep losses. This limits the government's exposure to risk. The funds in the AgriInvest account can be withdrawn at any time and used at the farmer's discretion. This flexibility allows farmers to address minor income shortfalls or invest in measures to mitigate future risks and enhance their farm's profitability.

On the other hand, it requires a partial reallocation of direct payments into support for precautionary savings, while the development of a 'new' scheme may face scepticism from the farming community, whereas small-scale farmers with tight profit margins may struggle to

[3] For more information, see: AgriInvest Program Guidelines (Sustainable Canadian Agricultural Partnership) - agriculture.canada.ca

contribute consistently, reducing the scheme's effectiveness. Another risk is that farmers may have a preference to rely on government support, e.g., price support, subsidies or disaster relief, during times of crises, rather than relying on their savings (while these savings may also serve as a form of pension savings).

It should furthermore be noted that precautionary saving focuses on income earned from agricultural activities, which ignores the role of off-farm household income, thereby ignoring differences in farmer risk management strategies with respect to involvement in on-farm and off-farm activities.

Public supported precautionary savings require the following subsequent actions:

- Determine fiscal and legal opportunities (pre-tax provision as a fiscal policy) as well as whether there is political support to facilitate public supported precautionary savings (i.e., allocated annual budget for matching farmers deposits by reallocating current agricultural support programs).
- Elicit farmers' willingness to deposit savings into a (pre-tax) precautionary savings bank account.
- Co-create term and conditions (i.e., maximum amount deposited and under which adverse conditions are withdrawals permitted) involving farmers, banks and the ministry.

Conclusions

There is no unique risk management model that meets the needs and situations of all farmers in Iceland. Given the diverse challenges faced by Icelandic farmers, a three-layered risk management approach is recommended to ensure comprehensive protection of farmers. The first layer, on-farm, refers to precautionary savings and diversification, which address frequent but manageable risks, thereby reducing dependency on external aid. The second layer, subsidised agricultural insurance, facilitates off-farm risk transfer for intermediate risks, balancing affordability and market participation. Finally, the third layer, ad-hoc disaster relief, is reserved for catastrophic events where market solutions fail, ensuring targeted government intervention without distorting market dynamics.

At the same time, the decoupling of farm payments may have an effect on farmers' risk preferences. With decoupled payments, farmers generally tend to adapt more easily to what is going on in the market and seize development opportunities, while decoupled payments also have limited crowding-out effects on other risk management strategies.

Options that could be further explored to either complement or enhance the currently available risk management tools to farmers in Iceland include precautionary savings, and the design of an ex-ante regulatory framework with strict conditions for the pay-out of disaster relief funds to farmers. Adjusting these mechanisms could enhance Iceland's resilience to financial and environmental risks and contribute to the sector's overall resilience.

Literature

van Asseldonk, M., Jongeneel, R., van Kooten, G.C. and Cordier, J. (2019), Agricultural Risk Management in the European Union: A Proposal to Facilitate Precautionary Savings. EuroChoices, 18: 40-46. https://doi.org/10.1111/1746-692X.12230

Duncan, J. and Myers, R.J., 2000. Crop insurance under catastrophic risk. American Journal of Agricultural Economics 82, 842-855.

European Commission: Directorate-General for Agriculture and Rural Development (2017). Study on risk management in EU agriculture. Publications Office of the European Union. https://data.europa.eu/doi/10.2762/976667

European Commission: Directorate-General for Agriculture and Rural Development (2020). Improving crisis prevention and management criteria and strategies in the agricultural sector. Publications Office of the European Union. https://data.europa.eu/doi/10.2762/650110

European Commission: Directorate-General for Agriculture and Rural Development. Chartier, O., Krüger, T., Folkeson Lillo, C., . . . Devot, A. (2023). *Mapping and analysis of CAP strategic plans – Assessment of joint efforts for 2023-2027*: Publications Office of the European Union. https://data.europa.eu/doi/10.2762/71556

Farmers' Association of Iceland, The Icelandic Food and Veterinary Authority. Livestock by region from 1980. Retrieved from: http://px.hagstofa.is/pxen/sq/de9cea73-fb63-4b39-9d8a-be55b917317e.

Mennig, P. and Sauer, J. (2023) Revisiting the impact of decoupled subsidies on farm performance: a counterfactual analysis using microdata, Applied Economics, DOI: https://doi.org/10.1080/00036846.2023.2266601

Ministry of Food, Agriculture and Fisheries (2022). *Tryggingamál bænda — Skýrsla starfshóps*. Retrieved from https://www.stjornarradid.is/library/04-Raduneytin/MatvAelaraduneytid/Tryggingamal_baenda_lokasky%CC%81rsla_sept_22.pdf

OECD (2000), *Income Risk Management in Agriculture*, OECD Publishing, Paris, https://doi.org/10.1787/9789264189584-en.

OECD (2009), *Managing Risk in Agriculture: A Holistic Approach*, OECD Publishing, Paris, https://doi.org/10.1787/9789264075313-en.

OECD (2023), *Agricultural Policy Monitoring and Evaluation 2023: Adapting Agriculture to Climate Change*, OECD Publishing, Paris, https://doi.org/10.1787/b14de474-en.

RÚV (2025, January 24). *Frost damage grants for North Iceland farmers*. Retrieved from Frost damage grants for North Iceland farmers - RÚV.is

Skees, J.R. and Barnett, B.J., 1999. Conceptual and practical considerations for sharing catastrophic/systemic risks. review of Agricultural Economics 21, 424-441.

Statistics Iceland (2024, May 23). *Production value of agriculture is estimated at 89 billion ISK in 2023.* Retrieved from https://www.statice.is/publications/news-archive/agriculture/production-value-of-agriculture-in-2023/

Statistics Iceland (2025, January 29). *Profits rose in sheep farming in 2023*. Retrieved from https://statice.is/publications/news-archive/agriculture/income-statement-and-balance-sheet-for-agriculture-2023/

Vaughan, E. and T. Vaughan, 1996. Fundamentals of risk and insurance. John Wiley & Sons, Inc, New York.

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