
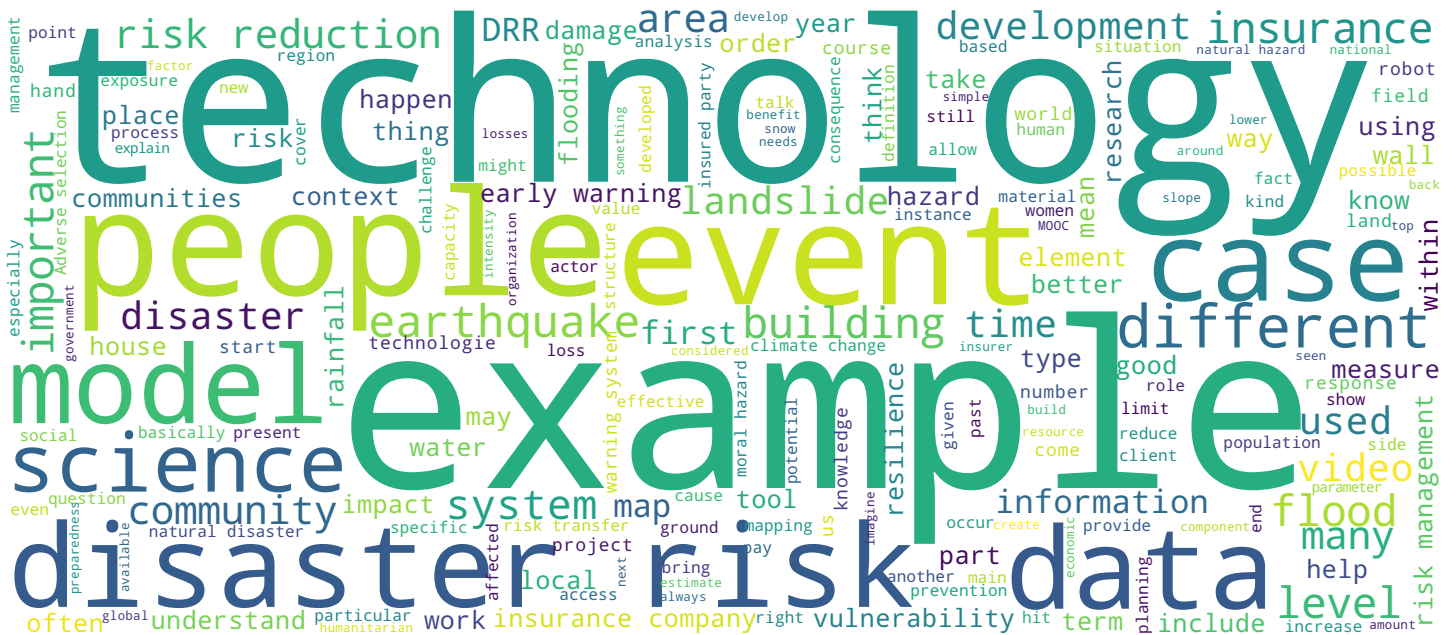


A Resilient Future: Science and Technology for Disaster Risk Reduction

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**Swiss Agency for Development
and Cooperation SDC**





- Insurance within broader risk management/reduction
- Definition and basic principles of insurance
- Solidarity and mutuality and its limits
- What is an insurable event?
- How to calculate a premium?
- An insurer's cause for headache
- A primer on index insurance

Insurance as a Risk Transfer Instrument A Resilient Future: Science and Technology for Disaster Risk Reduction Welcome to this video about insurance and disaster risk management. This particular video is produced for this MOOC by the SDC, the Swiss Agency for Development and Cooperation. I'm Roland Steinmann, a senior consultant on microinsurance with the MicroInsurance Centre. In this video you will get an introduction to the basic principles of insurance as a risk transfer mechanism and I explain how insurance fits into the broader disaster risk management approach. We will look at the definition and basic principles of insurance, solidarity and mutuality and its limits, what is an insurable event, how to calculate an insurance premium, the causes for headache from an insurer's perspective, and you will get a primer on index insurance.

Notes

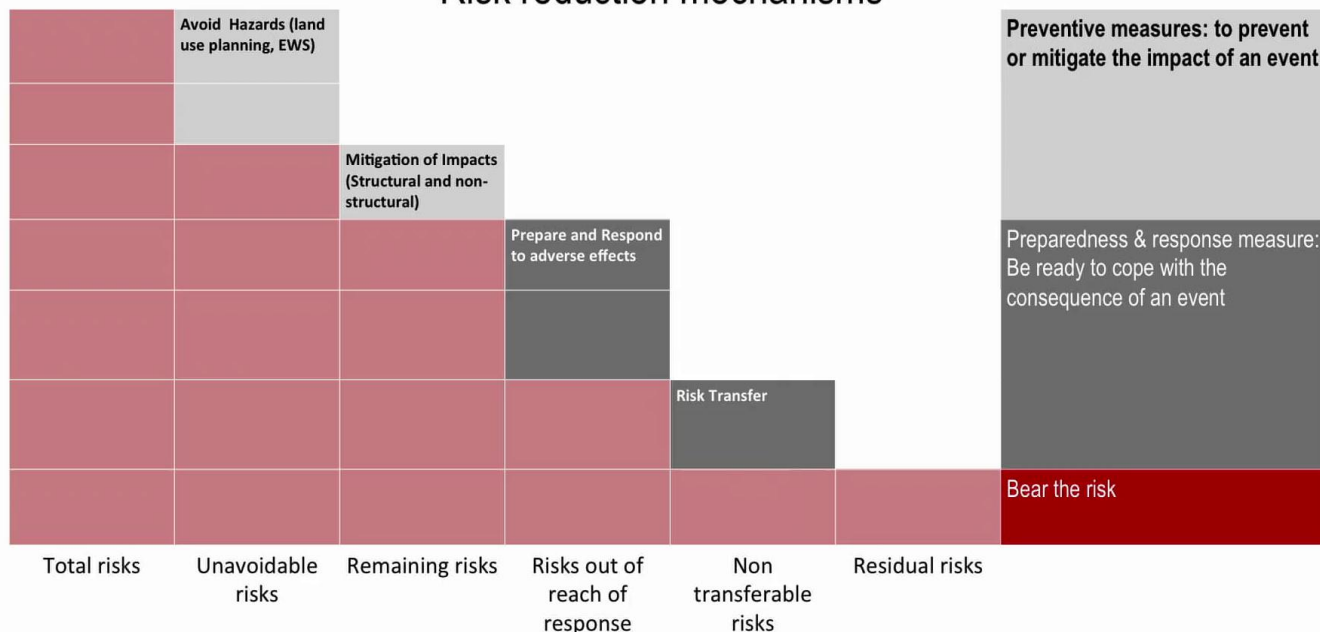
Summary



0m 00s

Insurance within broader risk management

Risk reduction mechanisms



(speaker) We all face a variety of risks and often have several options at hand to deal with them. For the purpose of illustration, let's look at flood risk. First, we can try to avoid certain risks, for example, we could move out of a flood risk zone to avoid being flooded. Second, we can reinforce dams so that in the case of a flood, the impact is lower than we had not improved it. Third, we can prepare for the flood event and plan what to do in case the flood occurs. Finally, we can take out insurance and by doing so, transfer at least part of the remaining risk to a third party. With this final step, we have introduced insurance into the disaster risk management area.

Notes

Summary



0m 51s

Definition and basic principles of insurance



“Insurance: **risk-transfer** mechanism that ensures full or partial **financial compensation** for the **loss** or damage caused **by event(s)** beyond the control of the insured party (...) within a **specified period**, provided a fee called **premium** is paid.”

(businessdictionary.com)

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But what is insurance? Insurance is a risk transfer mechanism that ensures full or partial financial compensation for the loss or damage caused by events that are beyond the control of the insured party within a specified period, provided a fee, called premium, is paid. Insurance products can be designed to cover individuals, households, groups or enterprises, and even countries. People buy insurance because they seek protection from financial losses that come with experiencing shocks.

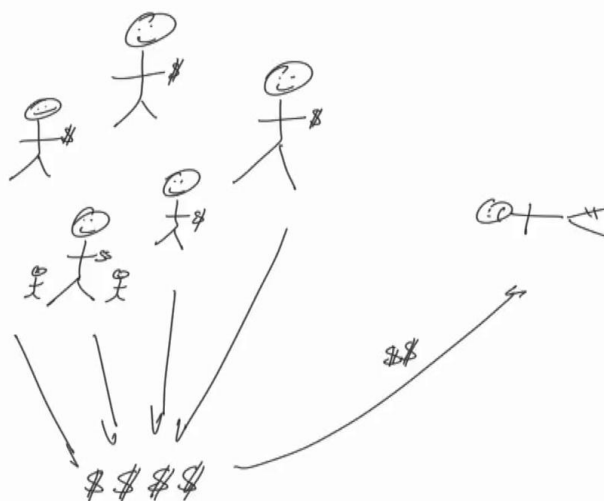
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1m 40s

Solidarity and mutuality and their limits



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(speaker) Good! So let's have a closer look at how insurance really works. At its very heart lies the principle of solidarity. It is about pooling of risks within a group, spreading costs within the community in order to absorb shocks. We can imagine inhabitants of a village coming together all contributing their share to a village health fund which covers health expenditures of the unlucky ones who get sick. The individual contribution is then lower than the payout of those that fall sick. You can imagine the same principle to cover other risks, like fire in your home or the death of a cow. However, there are limits to what can be handled through solidarity within a community. If health issues become an epidemic, if a fire ravages a whole slum or a city gets destroyed by an earthquake, the risk pool is too small and more importantly, all members are hit by the same event with mutuality basically breaking down.

Notes

Summary



2m 17s

Solidarity and mutuality and their limits



This is where pooling across different risks and geographies through re-insurance comes in.

Notes

Summary



3m 21s

What is an insurable event?



- Random
- Rather low frequency
- Beyond the control of the insured party
- Financial loss
- Proof of event / loss

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So what is an insurable event? An insurable event has to be random. Random and still you need to have a good sense of how often it can occur. The frequency should be rather low and the event definitely has to be beyond the control of the insured party. The event should also then cause a financial loss and you need to be able to have proof of the event of the loss, that it really has happened.

Notes

Summary



3m 27s

How to calculate a premium

$$\text{RISK PREMIUM} = \frac{1}{20} = 0,05 \times 50 \text{ M \$}$$

$$\Rightarrow 0,05 \times 50 = 2,5 \text{ M \$}$$

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The calculation of insurance premium it is the price to pay for transferring a certain risk can be highly complex in practice but the basic components are simple. (speaker) *For example, let's look at a certain flood level that occurs every twenty year. So then the risk premium would be 1/20 years times the severity. Let's assume it is fifty million dollar that this flood really costs so then risk premium would give us 52.5 million dollar per year that you need to cover the average expected loss over one year. In addition to this pure risk premium, you may have to add something to make up for the uncertainty.*

Notes

Summary

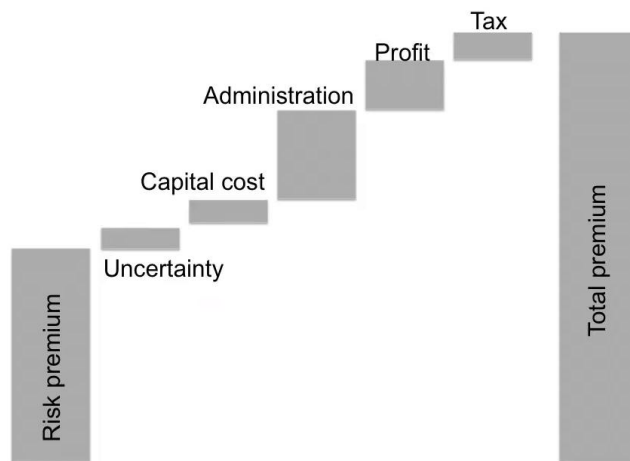


3m 59s

How to calculate a premium



Premium components



(3)

Does the flood really have a return period of twenty years or is it rather eighteen years? What if the losses were rather 53 million and not 50? Then, insurers need to cover their administration cost, capital cost, commissions paid to the agent, that sells the insurance policy and on top, you may add something for profit and taxes. What you see immediately from these calculations is the importance of good historical data and loss statistics. The better you know the past and the current exposure the better you can estimate the likelihood for a certain loss, calculate the premium and reduce the uncertainty loading. In the case of natural disasters, climate change has an impact on the value of event data as the past is not necessarily a good indication anymore of what could happen today.

Notes

Summary



4m 54s

An insurer's cause for headache



- Adverse selection
- Moral hazard
- Fraud

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Taking on the risk of others is the core business of insurance companies. However, they constantly worry about at least three key aspects related to this transfer of risk. Adverse selection, moral hazard and fraud. What does this mean?

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5m 50s

Moral hazard



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Adverse selection occurs if an insurance company designs and prices and insurance product for the average member of a given community but then ends up with clients that are more exposed to risk than the average. Examples here include health insurance, where you don't want to insure only the elderly or the smokers, when doing the research on product design phase, you have considered a large community of mostly fit, young, middle-aged people. Or, in the case of floods, you don't want to end up insuring only those living on the riverbank, like you can see here in the picture for Paris. Adverse selection has therefore also to do with information asymmetry between the insurer and the insured party.

Notes

Summary



6m 08s

Moral hazard



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(speaker) Moral hazard is describing the fact that people may change their behavior once they're insured. This can be positive and be an intended change, for example when people visit the doctor more often or quicker once they benefit from health insurance. However, even though this is positive from a public health perspective, it can cause problems for the insurance company if that effect was not foreseen or underestimated. Moral hazard is also viewed in the context of crop and livestock insurance where some farmers may pay less attention to their animals or crops once they know that they are protected through insurance. Fraud, or the willful distortion of truth, is a constant worry for insurance companies. For example, livestock is often tagged in order to identify individual animals. A few years ago, an Indian insurance company providing livestock insurance, required the farmer to send in the ear with the eartag of the dead cow in order to make a claim. This has led some farmers to simply cut ears off animals still alive, sending them in and getting an insurance payout. The cows with one ear left were known as Van Gogh cows in the local communities. Now what happens really if a loss occurs?

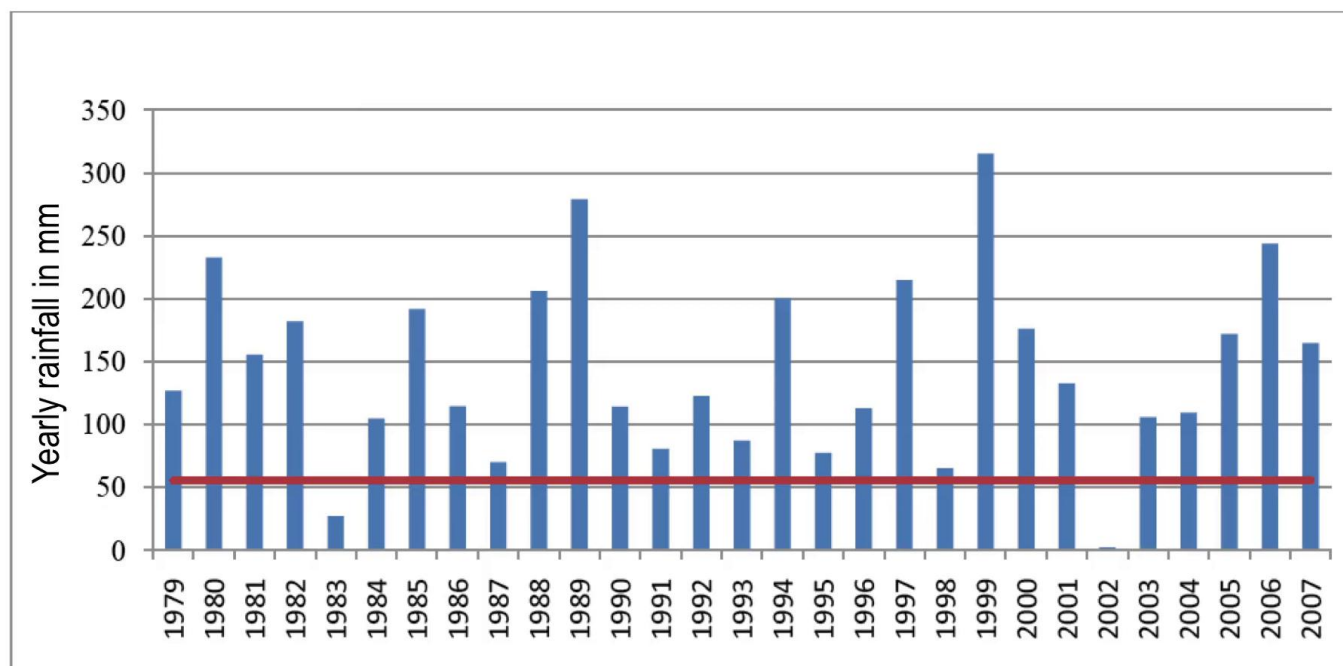
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6m 58s

A primer on index insurance



(7)

Traditionally, the insured party has to inform the insurance company about the event. You may have to prove that you really had bought insurance and that you have paid your premium in time and that you really had lost something in the event. Both can be tricky, in the case of natural disasters. Let's imagine a flood where your papers are likely simply gone, washed away. Potentially the insurance company has also lost their records too. And so, you may find it very difficult to prove that you really have insurance and what you have lost. For sure, the sheer number of claims it has to process would overwhelm the insurance company, causing long delays in settling legitimate claims. Verifying and settling claims after natural disaster is typically a lengthy and costly process. These challenges have motivated a new approach to insurance, especially in the field of natural disaster and agriculture. It is parametric or index based insurance. With index insurance, as these products are often called, the decision of whether to pay or not to pay depends on an objective measure such as quake intensity in the case of earthquake, windspeed in the case of hurricanes, amount of rainfall in the case of crop insurance, or water depth in the case of flood. In other words, the insurance company creates a correlation between an objective, independently verifiable measure on the client's loss.

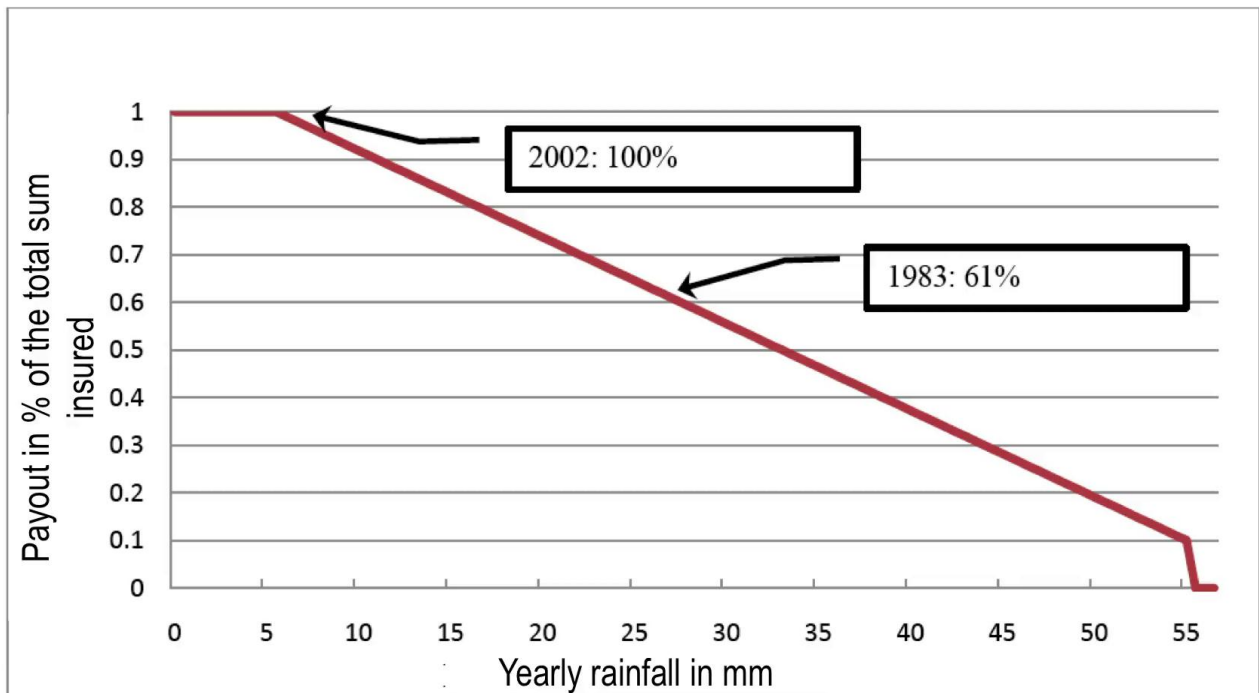
Notes

Summary



8m 19s

A primer on index insurance



(8)

(speaker) So let's have a look at this graph. It shows yearly rainfall data in millimeters of rainfall over a period of about thirty years. The red line indicates the level below which the index product would start to pay out. So in this case here it is about 55mm of rainfall, if you have less than 55mm, then you'll get an insurance payout. What you see here is how this payout is then really correlated to the amount of rainfall. You start by 56mm and then you have a linear payout up to about 7mm of rainfall and in the example here, 1983, you had a payout of 61% because your rainfall was about 27mm. This index approach comes with huge advantages as adverse selection and moral hazard are effectively eliminated and the insurer doesn't have to send loss adjusters out to the field after the event. Thus, speeding up claims administration dramatically. The disadvantages and limitations, however, are also quite important. First, you have to find a really, really good correlation between the index you want to use, rainfall, quake intensity etc.

Notes

Summary



9m 57s

Main points



- Insurance is a useful component in the context of DRR
- It can limit the financial consequences of events and motivate people to invest in preventive measures
- There is no proper disaster risk management with insurance alone
- Combination of several approaches is essential

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and the losses observed. Otherwise, clients can't rely on this type of insurance and will have to consider it rather a lottery than effective risk transfer. Second, you are in trouble if not all clients experience the same level of destruction or loss. This imperfect correlation between the index and the individual's loss is known as basis risk. The policy may trigger in cases where no or less payouts would be required and may not trigger, even though the client has experienced a loss. Insurance is a useful component in the context of disaster risk reduction. What is can achieve is limit the financial consequences of events and motivate people to invest into preventive measures. However, there is no proper disaster risk management with insurance alone. Therefore, we definitely need a combination of several approaches and remember the options at hand.

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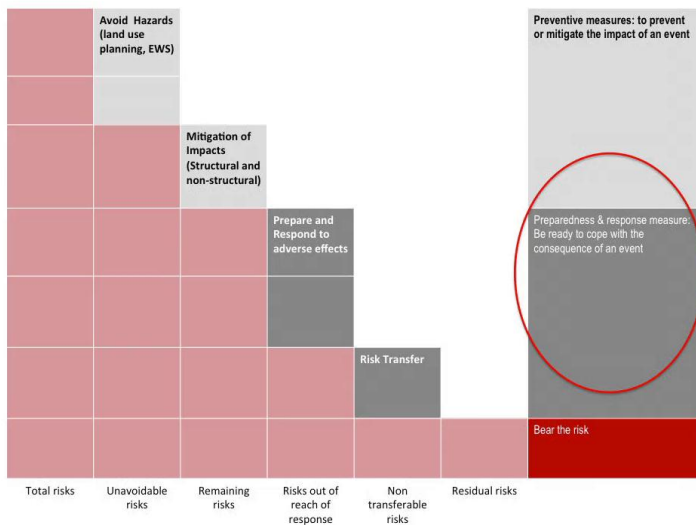
Summary



11m 27s

Main points

Risk reduction mechanisms



(11)



(12)

(speaker) *Prevention and avoidance on the one hand and mitigation of risks, prepare for events and transfer parts of the risk to insurance markets on the other hand. In the context of disaster risk management and especially in emerging economies, prevention is almost always the cheaper option than insurance, at least in the long run.*

Notes

Summary



12m 27s

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Notes

Summary



12m 50s