





- A development perspective on risk
- Integrate DRR into development
- Towards transformative resilience

A Resilient Future: Science and Technology for Disaster Risk Reduction

Hello. In this video I will talk about the fact that risk can also be an engine for sustainable development. I will explain how we need both. A development perspective on risk, and a risk perspective on development. This will lead us to the need of integrating DRR into development initiatives, in order to develop a common agenda, and identify trade-offs. Ultimately, DRR is an opportunity towards transformative resilience, helping communities to become more sustainable, and more resilient in the future.

Notes

Summary



0m 04s

# Integrate DRR with sustainable development



- DRR and development are closely related, and we need to integrate DRR with equitable, sustainable and resilient development
- We need to find out how development can be transformed from a root cause of disaster risk to an opportunity to reduce risk

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Disasters strike both developed and developing countries. Furthermore, the globalization of the economy can also mean that disasters can have far-reaching consequences. For example, the 2011 flooding in Thailand inundated several industrial zones, and affected global supply chains. The damage from natural disasters is often higher in developed countries where infrastructure is more costly to rebuild and repair. However, compared to the usually lower gross national product, the economic impact is often much larger in developing countries. Development can increase risk in the long-term-- for instance, by increasing greenhouse gas emissions that drive climate change. Climate change can contribute to the intensity of rainstorms, which can lead to a higher risk of landslides. Disasters can even set back entire populations, and reverse the benefits of development achieved in the past. In August of 2010, floods occurred across a large part of Ladakh, a region in northern India, damaging 71 towns and villages, among them the Marka valley, which you can see on your right. DRR and development are closely related, and we need to understand how risks are created, and how they can be reduced.

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0m 40s

# Integrate DRR with sustainable development



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It is very important to integrate DRR with equitable, sustainable, and resilient development. We need to find out how development can be transformed from a root cause of disaster risk to an opportunity for reducing risk.

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2m 04s



# Two perspectives

We need:

- A development perspective on risk

AND

- A risk perspective on development



Despite the fact that we have made much progress in understanding disaster risk, the basic dilemma between development and disaster risk remains unchanged. We could almost say that we need a development perspective on risk, and a risk perspective on development. We need to articulate a dual perspective, and diagnose how disaster risk in development can be understood, and acted upon, and how risk reduction can be included in development.

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2m 21s

# DRR through development

- January 2010 earthquake (7.0 on Richter scale) in Haiti: 230'000 fatalities
- February 2010 earthquake (8.8 on Richter scale) in Chile: 525 fatalities

Reason for lower death toll in Chile:

Enforcement of building codes made buildings more robust to ground tremors.

(The World Bank, 2014)

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The different impacts of the earthquakes in 2010 that happened almost simultaneously in Chile and Haiti, illustrate how development can offer opportunities for disaster risk reduction. Whereas there were more than 200,000 fatalities in Haiti, there were about 500 fatalities in Chile, despite the fact that the earthquake in Chile was significantly stronger. The main reason behind this, is that Chile decided to invest in better preparation, and enforce strict building codes that make buildings more robust to ground tremors.

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# DRR as an opportunity for development



- Support integration of knowledge to create a joint understanding of vulnerability, resilience, and hazards
- Conduct transdisciplinary assessments to create a joint development of problem definitions, concepts, and approaches

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Let me illustrate how DRR can be integrated with development, with another example. In DRR, as in all development projects, it is crucial that different ministries collaborate. For example, the ministry for energy, the ministry for environment, and the ministry for disaster management and relief work, need to work together in order to integrate DRR measures in their development activities. This means that key policy processes need to be structured in a way to facilitate this integration. For instance, each environmental impact assessment required for development projects should contain a specific part on reducing risk that requires the consultation of the other concerned ministries.

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3m 27s

# Mainstreaming DRR into development projects



Science and technology have a crucial role to play in supporting how DRR can be mainstreamed into development projects

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Development is a key factor in reducing vulnerability and building resilience. For example, by increasing income or increasing literacy levels. Through a better education people have more revenue-generating opportunities, which makes them more resilient. Furthermore, literate populations can better understand evacuation and early warning information, and easier access post-disaster aid. Science and technology have a crucial role to play in supporting how DRR can be mainstreamed into development projects. For instance, satellite images can help us identify where flash floods are likely to occur, and with the right technology we can construct appropriate floodways in the right locations. Information and communication technology is essential in many development projects as well as in early warning systems. For instance, by allowing the large-scale and simultaneous distribution of warning information through mobile phones.

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4m 12s



# The role of science: a few examples



<p>Monitor and evaluate progress</p> <p>Science based monitoring and evaluation frameworks and indicators are needed</p>	<p>Climate change adaptation CCA</p> <p>DRR is part of CCA. Policies need to be based on scientific evidence of co-benefits</p>	<p>Identify policy barriers</p> <p>National policy can reduce risk through social policy combined with hazard mitigation</p>	<p>Bring innovation</p> <p>Science allows us to couple technological innovation with social understanding</p>
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In this table, I am giving you a few examples of the importance of science. Firstly, we need science-based monitoring and evaluation frameworks and indicators. Secondly, DRR is part of climate change adaptation, where science has an important role to play in the development of policies that lead to co-benefits. For example, reforestation projects aimed at stabilizing areas affected by landslides, will directly contribute to climate change adaptation. Lastly, science allows us to bring together the most promising technological innovations with a social understanding. For example, we need both computing power as well as anthropological awareness in order to develop early warning systems that are effective.

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# Research on decision-making processes



DRR research also needs to focus on decision-making processes in order to understand the rationale of development decisions, its relation to risk, and the trade-offs that need to be made

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DRR research needs also to focus on decision-making processes in order to understand the rationale of development decisions, and its relation to risk, and the trade-offs that need to be made.

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6m 05s

# Science as a collaboration platform



Science can help foster relationships of trust between scientists, policy-makers, and communities at risk

This will help build resilience

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Building resilience requires relationships across all stakeholders, and science can drive these relationships. Science can provide us a strong foundation for trust-based platforms that can support collaborations among many communities. For instance, in New Zealand, following the 2011 earthquake in Christchurch killing 185 people, the government adopted a new integrated approach and a number of innovations in early warning, land-use planning, and experiments in local democracy, economic and social development. This illustrates how DRR can be an engine for sustainable development leading to more resilience. Christchurch is now one of the Rockefeller 100 Resilient Cities.

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# Integrated Watershed Management - Tajikistan

**CARITAS**

Schweiz  
Suisse  
Svizzera  
Svizra



Schweizerische Eidgenossenschaft  
Confédération suisse  
Confederazione Svizzera  
Confederaziun svizra

Swiss Agency for Development  
and Cooperation SDC



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## Key project factors:

- Inclusive decision-making processes strengthen institutional capacities
- Watershed Action Plans developed in a participatory manner have become mechanisms for the good governance of natural resources
- Through DRR, the sense of ownership has increased, and the planning and budgetary capacities of the local stakeholders have been strengthened, thus contributing to sustainable development

The Integrated Watershed Management project in Tajikistan, lead by Caritas and funded by the Swiss Agency for Development and Cooperation, SDC, aims for DRR through sustainable land management, and improved governance. It tries to reduce risks related to floods, mudflows, landslides, and declining land productivity. The project has been quite successful due to its emphasis on inclusive decision-making. This has strengthened institutional capacities because the Watershed Action Plans have become a mechanism to establish good governance of natural resources. Through DRR, the sense of ownership has increased, and planning and budgetary capacities of the local stakeholders have been strengthened, contributing to the sustainable development of this region.

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7m 04s





Building transformative resilience means that a community not only bounces back from a disaster but can also bounce forward

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Building transformative resilience means that a community not only bounces back from a disaster but can bounce forward. By forward, we mean in a more sustainable direction contributing to long-term capacity. However, we need to know how to get key stakeholders to develop a shared vision of both the risks that exist in their particular contexts, and what action to take in the short- and long-term. Resilience helps us to think about and foster development in a new way.

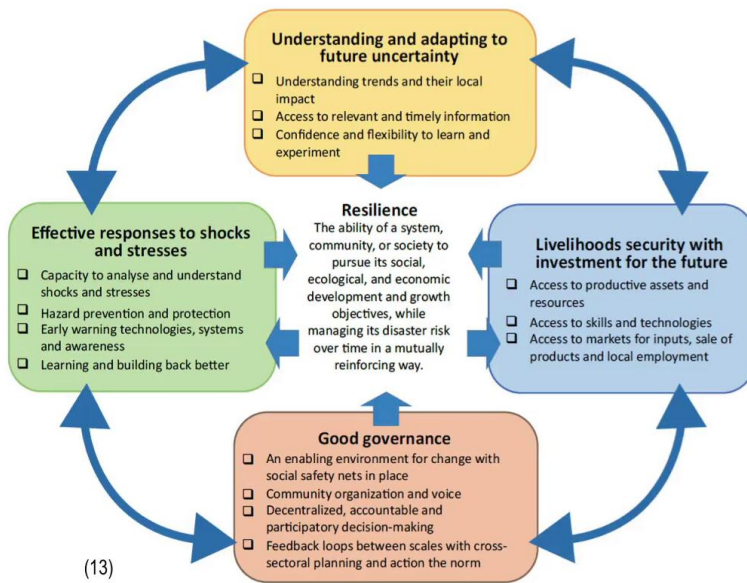
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7m 55s

# From vulnerability to resilience (V2R)



Practical Action developed this framework for analysis and action to reduce vulnerability and strengthen resilience

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The NGO Practical Action developed this framework which can help us analyze the transitions from vulnerability to resilience. This framework shows the complexity of a systems approach to resilience in a simple diagram. It highlights the relationship between the various factors to be taken into account in strengthening resilience. It illustrates the interrelationships between communities' well-being and local drivers of risk, national and global trends-- which contribute to uncertainty-- and the influence of the governance environment. Its purpose is to aid practical analysis in order to identify key issues and priorities to be addressed in order to strengthen resilience.

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# Measuring resilience



Measuring the capital profile of a community:

- Human capital (education, skills)
- Social capital (relationships, networks)
- Natural capital (land, water)
- Physical capital (infrastructure, equipment)
- Financial capital (income, credit)

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Measuring resilience is important for tracking performance, and understanding impacts. Tools to measure resilience are still in their early stages, and there is currently little consensus on best practice. The main reason is the complexity of a systems approach that leads to a large number of diverse elements that lead to a number of questions. At what stage is measurement appropriate? Do we measure resilience before, or only when a disaster occurs? Practical Action and the Zurich Global Flood Resilience Program use an approach to measure resilience based on the five capitals of a community. Namely, the human, social, natural, physical, and financial capital.

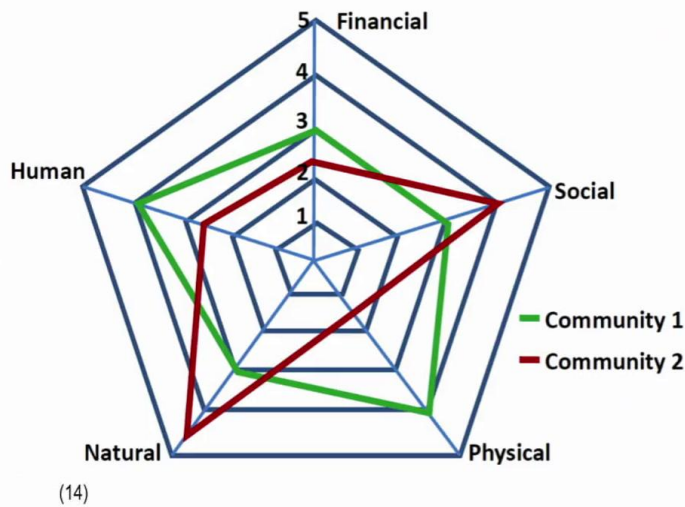
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9m 10s

# Measuring resilience



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Disaster Risk Reduction

This is an example of a spider web diagram of two communities scored on the five capitals. It remains challenging to quantify these scores, as each capital embraces a wide range of elements. Furthermore, it will be important to understand the interactions between the different elements. For example, how do social assets influence access to specific resources? It is hoped that ultimately through this standardized approach, we will understand how capitals interact, and how this knowledge can be used to enhance resilience.

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The OECD has published the “Guidelines for Resilience Systems Analysis: How to analyze risk and build a roadmap to resilience” that contains a specific methodology for building resilience

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Another organization that has developed concrete how-to guidelines, is the Organization for Economic Cooperation and Development, OECD. OECD has published the *Guidelines for Resilience Systems Analysis: How to analyze risk and build a roadmap to resilience*, that contains a specific methodology towards building resilience. You can find it in the additional materials section.

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# Remaining challenges



- Measurement of resilience is important. Scientific research is needed on how to establish indicators and measure the dynamic interaction between them
- Disaggregated data on gender, social norms, and levels of asset ownership, is needed to build resilience from the most vulnerable upwards
- More knowledge of decision-making mechanisms is required

Some challenges remain. For instance, we are only in the beginning of knowing how to effectively measure resilience. Furthermore, we systematically require disaggregated data on gender, social norms, and levels of asset ownership, in order to build resilience from the most vulnerable upwards. Finally, we need more knowledge on decision-making mechanisms as it can be very difficult to make the right trade-offs.

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10m 55s

# Main points



- DRR and development are closely related
- Disasters affect developed and developing countries, but low-income countries and populations suffer disproportionately
- The need for development to take into account DRR
- DRR can be an engine for sustainable development
- Practical Action V2R framework
- Towards a resilient future

In this video we have seen that DRR can be an engine for sustainable development. DRR and development are closely related, and we need to integrate DRR with equitable, sustainable, and resilient development. We need to find out how development can be transformed from a root cause of disaster risk to an opportunity for reducing risk. Practical Action has developed an analytical framework that can help us to adopt approaches that can support the transition from vulnerability to resilience, and ultimately lead to more resilient communities, and a more resilient future.

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11m 22s

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