SESSION 5: ROLE OF ECONOMIC AND FINANCIAL INSTRUMENTS IN NO-REGRET ADAPTATION

Training workshop on the identification and development of climate change no-regret actions in the water sector, 3-5 October 2012, Amman

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Objectives of Session 5

- **Goal:** Increase the understanding of the participants on the potential benefits, as well as the limits and challenges concerning economic and financial instruments for no-regret adaptation to climate change in water management

- **Learning Objectives:**
  - Understand the different economic and financial instruments presented
  - Strategize the use of different policies and instruments to build climate resilience
  - Promote adaptation at the appropriate level.

Outline

1. Rationale of EFIs instruments

2. Typology of EFIs instruments, purposes and features for no-regret adaptation in the water sector

3. Examples

4. Q&A, Discussion

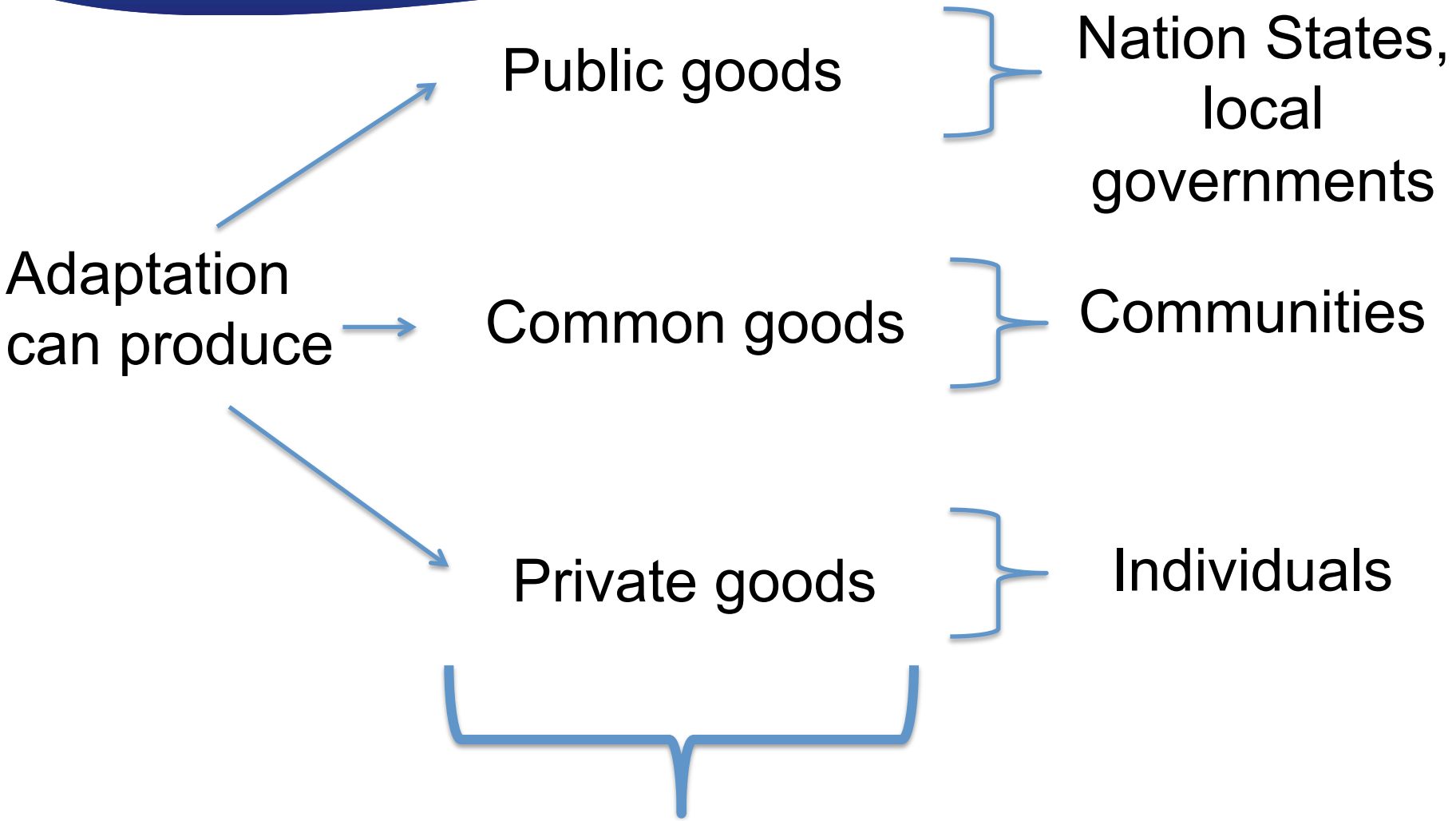
1. Rationale of EFIs instruments

As part of an appropriate policy mix within a broader no-regret adaptation strategy, EFIs instruments can:

- Promote efficiency in water use and allocation
- Identify low-cost adaptation options
- Promote flexible, scalable and reversible options
- Signal scarcity and optimal timing for new investments
- Provide incentives to reduce risk exposure
- Provide means to spread and hedge risk
- Reduce financial constraints to taking timely adaptation actions and recovering from water-related disasters

Source: OECD, 2012

1. Rationale of EFIs instruments



2. Typology of EFIs instruments, purposes and features

A. Instruments to finance no regret adaptation: “3 Ts”
   a. Water Tariffs
   b. Taxes (and charges) for water abstraction, water pollution, and other taxes applied to water users
   c. International, regional, national or local Transfers

B. Incentives to influence water allocation and distribution
   a. Price signals/markets

   Or rather looking at approaches taken from Political economy or institutional economics?

   b. Regulatory incentives at various levels

C. Covering residual risks (insurance, risk sharing and social safety nets)

2. Typology of EFIs instruments, purposes and features

- Prescription: “command-and-control regulation"
- Financial penalties and charges: not about forbidding or regulating but about charging
- Persuasion: aiming at “auto-regulation”
- Property rights: privatizing the resource and organizing its trade
- Payment: subsidizing directly or indirectly practices that benefit society but that are not integrated into the market (externalities)

Source: Salzman, 2005.

3. Examples

A. Instruments to finance no-regret adaptation:
   Tariffs & taxes
   Transfers

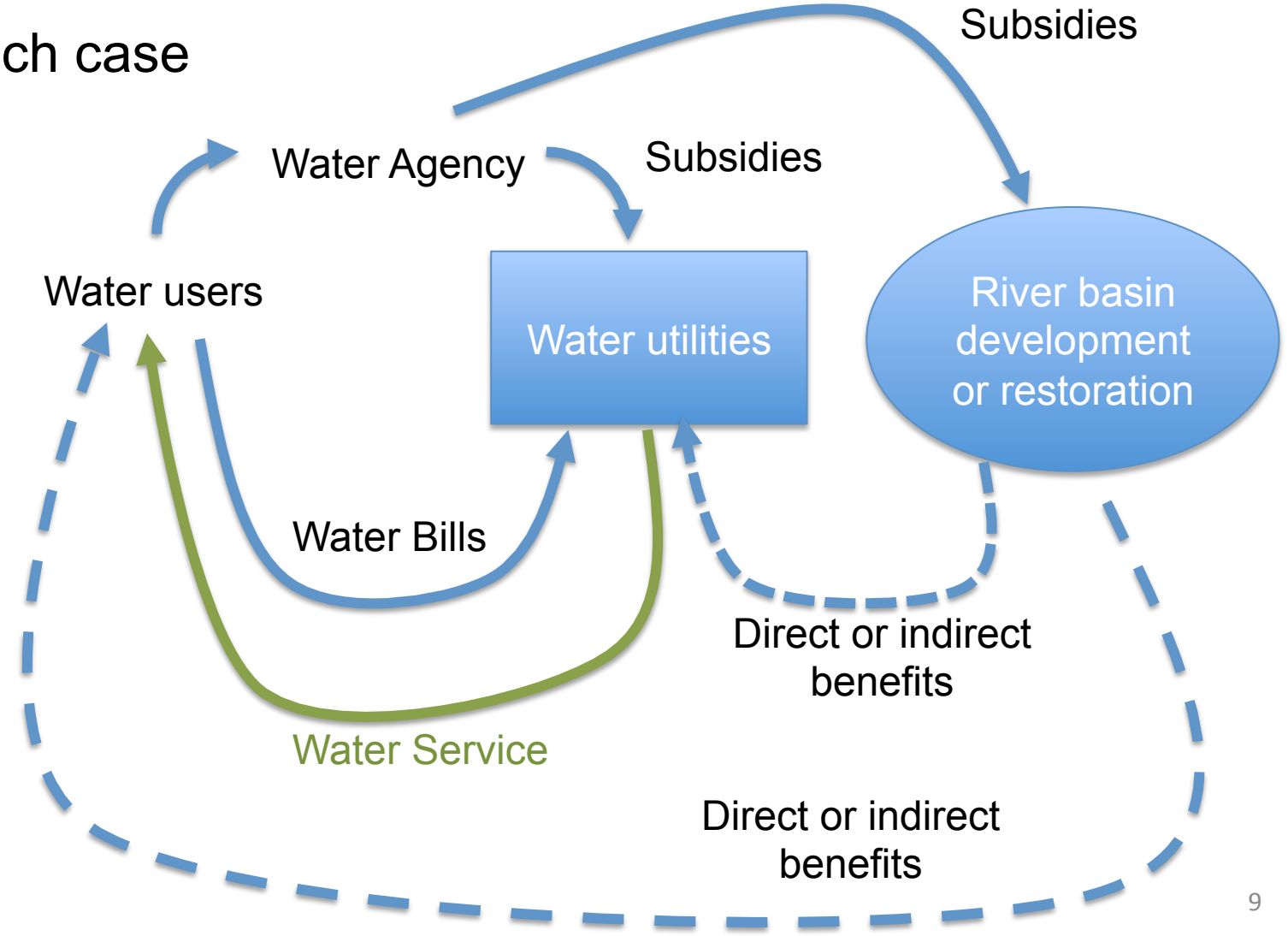
B. Incentives to influence water allocation & distribution
   Price signals & water markets
   Payments for environmental services

C. Challenges for covering risk

A. Instruments to finance no-regret adaptation

Tariffs & taxes

The French case



A. Instruments to finance no-regret adaptation

Tariffs & taxes

Irrigation water pricing and incentives to save water accross the Mediterranean

Tariff structure	Examples of countries concerned	Degree of incentive to save water
None	Albania, Egypt, Palestinian Territories	None.
Standing charge per hectare	Spain, France, Greece, Italy, Lebanon, Syria	Combined with very low prices and subsidies for irrigated output. This has tended to encourage an increase in irrigated areas and a rise in demand for agricultural water.
Incremental standing charge (According to irrigated crop or irrigation technology)	Italy, Turkey	Does not encourage water saving for a given cropping system or irrigation technique, but is usable to discourage irrigation of certain crops which consume a lot of water (e.g. maize and tomatoes in Turkey).
Two-part charge	Lebanon (new areas of South Beqaa), Tunisia (areas of controlled irrigation)	Fixed element based on irrigable area, with incentive to irrigate land which has the facilities. Proportionate element based on volumes of water actually consumed: encourages rational water use.
Uniform volumetric pricing	Cyprus, Spain, France, Morocco, Tunisia	Encourages water saving (according to price level).
Incremental volumetric charging (rarely applies to irrigation).	Israel	Strong incentive to save water within limits of set quota (according to price progression and level).

Source: GWP & Plan Bleu, 2012; CIHEAM & Plan Bleu, 2009; Chohin-Kuper, Montginoul & Rieu, 2002.

A. Instruments to finance no-regret adaptation

Tariffs & taxes

Source: Acteon, 2010

Abstraction charges & taxes

Country	Source of water	Unitary rate	Total Annual Revenues	Payers	Appropriation of funds
Australia (Australian Capital Territory) (ACT 2009, ACTEW 2010)	All sources of water	0.49 USD/m³ urban water supply, 0.21 USD/m³ all other licenses	USD 23 million (2009)	All users	Full cost recovery (Water supply, scarcity values, environmental costs)
Belgium (Flanders) (OECD 2009, OECD 2010)	Groundwater	0.08 USD/m^3	USD 25,7 million (2007)	All users; except drinking water (higher charge)	Fund for the protection of ground waters
Denmark (Ecotec 2001)	All sources of water	0.84 €/m^3	€ 209 million (2000)	Domestic users only	General taxation
France (Seine-Normandy) (AESN 2008, Strosser & Speck 2004)	Surface water (basic rate) Groundwater (basic rate)	0.00071 €/m^3 abstracted, 0.04 €/m^3 consumed 0.024 €/m^3 abstracted, 0.04 €/m^3 consumed	€ 64,8 million (2008)	All users	Water management in the river basin (water treatment, water protection, research, administration), international cooperation projects
Germany (11 of 16 Federal States) (OECD 2010, UBA 2005, Gaulke 2010)	All sources of water	Range from 0.015 €/m^3 (Saxony) to 0.31 €/m^3 (Berlin)	Range from € 1.7 million (Mecklenburg-Vorpommern) to € 86 million (Nordrhein-Westfalen); 376.1 million € from all 11 states together (2008)	All users, except fishery and low amounts (less than 2000 – 10000 m³) – depends on Federal State	Depends on Federal state, e.g. Nature conservation, protection of ground and surface water, reforestation, soil protection and decontamination
Netherlands (OECD 2009, CFE 2001)	Groundwater	0.1883 €/m^3	€ 184 million (2006)	All users; farmers only if more than 40000 m^3/a	General taxation
Netherlands (Provinces) (OECD 2010, VROM 2006)	Groundwater	Range from 0.081 – 2.54 €/m³ (2003)	€ 14 million	All users	Expenditures in the field of water resources, anti-hydration studies

A. Instruments to finance no-regret adaptation

Tariffs & taxes

Source: Acteon, 2010.

Pollution charges & taxes

Country	Basis of calculation	Unitary rate	Total Annual Revenues	Payers	Appropriation of funds
Belgium (Flanders) (OECD 2009; OECD 1999)	Pollution unit/pollution content	€24.29 per p.u. (1999)	USD 250.1 million (2007)	Direct and indirect dischargers	Environmental policy in general
Czech Republic (OECD 2009, OECD 2010)	Pollution content	Varies according to the cost of pollution abatement	USD 17.5 million USD (2007)		State Environmental Fund
Denmark (OECD 2009, Ecotec 2001)	Pollution content	1.48 €/kg of BOD, 2.69 €/kg of N, 14.78 €/kg of P	USD 33.2 million (2007)	Direct dischargers; only domestic users and industry, reduced tax for 6 types of industry	General budget, partly devoted to an independent Water Fund (groundwater protection)
Estonia (OECD 2009, Ecotect 2001)	Pollution content		USD 4.8 million (2006)		Environmental measures
France (Seine-Normandie) (AESN 2008, OECD 2010, OECD 1997)	Pollution content/users	Vary for different substances and users, based on permits	€ 643,7 million (2008)	Direct and indirect dischargers	Water management in the river basin (water treatment, water protection, research, administration), international cooperation projects
Germany (Ecotec 2001)	Pollution unit/pollution content	€ 35.79 per p.u. (2010)	€ 367 million (1998)	Direct dischargers	Municipal sewage treatment, water quality programmes
Hungary (OECD 2009, Ecotec 2001)	Pollution content		USD 6.1 million (2006)		General budget, earmarked
Netherlands (OECD 2009, Ecotec 2001)	Pollution unit/pollution content	29€ per p.u. (state waters), average of 37€ per p.u. (Water Boards)	USD 1579 million (2006)	Direct and indirect dischargers	Finance water and wastewater management activities, covers the costs of sewage treatment

A. Instruments to finance no-regret adaptation

Tariffs & taxes

Source: Acteon, 2010.

Hydropower fees

Country	Basis of calculation	Rate	Total Annual Revenues	Payers	Appropriation of funds
Switzerland (Banfi et al. 2005)	Gross capacity (kW)	Max. 54 €/kW	€ 328 million (2001)	All hydropower plants	Budget of municipalities and cantons
Norway (Finansdepartementet 2010)	Average of the individual power plant's total production over the last 7 years	1,6 €/MWh	-	All hydropower plants	Mainly budget of municipalities, small part to the general state budget
Finland (planned from 2011) (Statsrådet 2009)	Production	1-10 €/MWh	€ 33-330 million (estimated)	Big hydropower plants	General state budget
China (provincial level) (Porras & Neves 2006)	Production	Varies, e.g. 0,0001 $/kWh (Guangdong), 0.0012 $/kWh (Liaoning), 0,1 $/kWh (Guangxi Zhuang)	$ 120,000 (Guangxi Zhuang)	All hydropower plants	Watershed forest management and planting

A. Instruments to finance no-regret adaptation

Tariffs & taxes

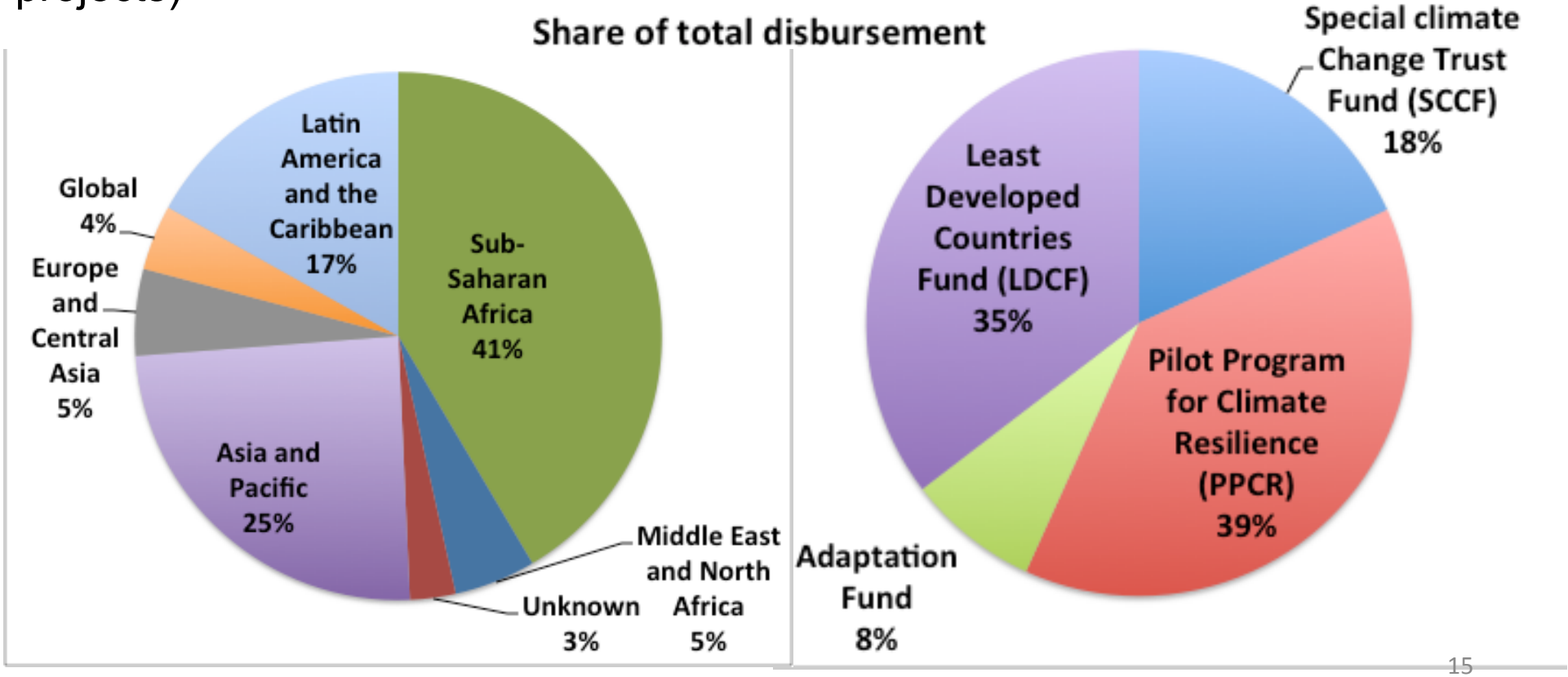
- Navigation fees
- Fees for extracting material from the river bed
- Fishing fees
- Forest and Water Source Environment Tax
- Stormwater/rainwater collection fees

A. Instruments to finance no-regret adaptation

Financial transfers

International financial mechanisms:

UN Trust funds (grants): GEF, Least Developed Countries Trust Fund (LDCF) and Special Climate Change Trust Fund (SCCF), Adaptation fund (levy on CDM projects)



Source: Dataset by Climate Fund Update (2012)

A. Instruments to finance no-regret adaptation

Financial transfers

Micro-finance:

- Already promotes adaptation since provision of credit and other financial services that can help developing alternate livelihood opportunities, build assets and spread risks.
- And also needs adjustments to incorporate long term climate change and allow flexibility in repayment schedules

PPPs:

- Can current and future PPPs be adjusted to climate-proof the investments they make?
- Are they suitable to finance, build and operate dedicated climate protection schemes, such as flood barriers and coastal defenses?

B. Influencing water allocation & distribution

Price signals/water markets

- Factors limiting the effectiveness of price signals:
  - Elasticity to price variations remains unclear
- Factors limiting the effectiveness of « formal » water markets
  - The contradiction between the need of numerous and heterogeneous water users and the cost of transferring water over significant distances
  - Importance of transaction costs

Solutions lie in combined economic and institutional instruments to render resource allocation more flexible by reducing transaction costs, while bringing in equity concerns

B. Influencing water allocation & distribution

Payments for environmental services

Payments particularly well adapted

1) when entitlements lie with service providers and regulatory authority is lacking;
2) when there is information asymmetry between providers and consumers of services and information costs are high;
3) when there is a heterogeneous landscape, and entitlements are either conflicting or below desired land use practices; or,
4) when the political context creates the equivalent of a Voting Assent world and coercive measures are infeasible.

Need to ask:

(1) *what* services need to be delivered,

(2) *how* they are to be provided,

(3) *who* the providers and beneficiaries are to be, and

(4) *how much* service provision is necessary

Source: Salzman, 2005.

C. Challenges for covering risk

Insurance:

Possible incentive to adaptation if premiums are well designed but not a panacea…

Factors limiting the effectiveness of insurance:

- Difficulty of pricing weather risk in the future
- For rainfall, historical record show different trends according to the period considered (to the time reference used)
- Attempting to subsidize the cost of insurance when the central tendency is changing will be more costly and more clearly recognized as a subsidy by farmers, and consequently, more likely to delay adaptation

Index-based insurance: it can reduce moral hazard…

The experience in Morocco (index based on rainfall) has shown little interest from market due to declining trend in rainfall, leading the State to take over to manage and fund the insurance system.

C. Challenges for covering risk

Social safety nets

- A focus on the poorest sections of society
- Transfer of resources (cash) to households in order to smooth consumption or support income

Challenges and opportunities according to their scale and scope (private, common or public goods)


شكرا لانتباهكم
Thank you for your attention

4. Q&A, Discussion

1) Are economic and financial instruments being used in water resources management in your country ? Give examples where possible.

2) What are their effects on the adaptation capacity of the water sector towards climate change?

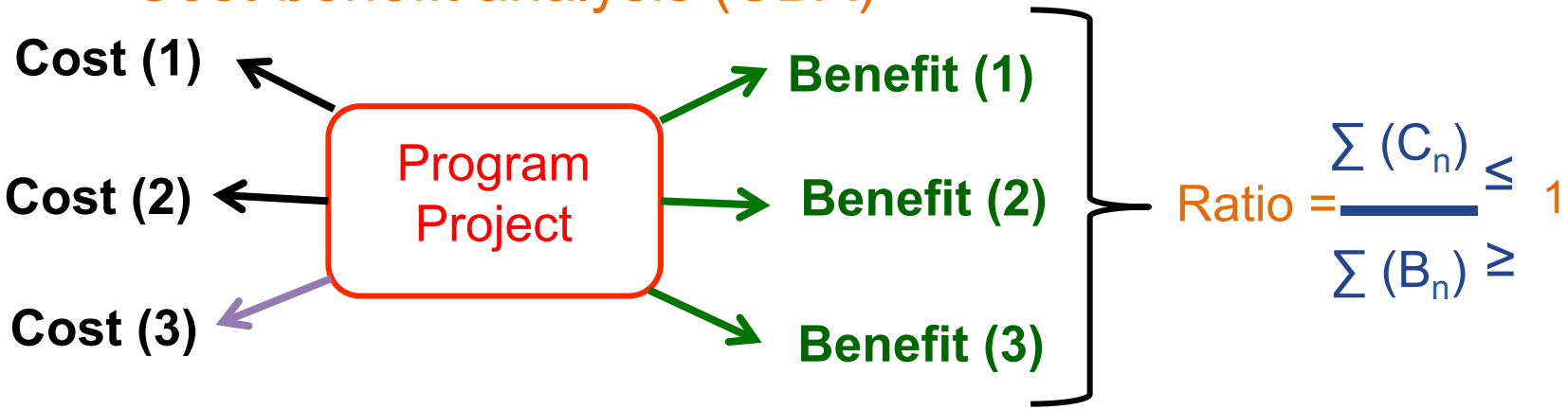
3) What is the institutional framework sustaining the use of these instruments?

4) What are the key challenges or opportunities for the development of these instruments in your country?

Extra slide…

Economic and financial evaluation of adaptation to CC in the water sector

- Cost-benefit analysis (CBA)



- Cost-effectiveness analysis (CEA)