

Main activities in mountain areas: agriculture, forestry, animal husbandry and tourism



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Some structural data on mountain economics

The role of mountain is very significant: in the EU-27, 40% of the Union's territory is mountainous, while hosting less than 20% of the total population

In Italy more than half of the country (54.33%) is mountainous, as about a third of the municipalities (32.1%)

By contrast only 12.6% of the population lives in the mountains

ISTAT, 2011 census

Some structural data on mountain economics

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The last national demographic data

Prospetto 8 – Numero di comuni e popolazione residente per zona altimetrica e ripartizione geografica – Censimento 2011, primi risultati (valori assoluti e composizioni percentuali)

Ripartizione geografica	Comuni				Popolazione residente nei comuni			
	Montagna	Collina	Pianura	Totale	Montagna	Collina	Pianura	Totale
Valori assoluti								
Italia Nord-Occidentale	1.003	1.027	1.029	3.059	2.464.305	4.159.229	9.167.801	15.791.335
Italia Nord-Orientale	577	284	619	1.480	1.636.629	2.439.066	7.395.078	11.470.773
Italia Centrale	268	686	42	996	1.065.208	6.551.809	3.986.615	11.603.632
Italia Meridionale	617	857	316	1.790	1.613.769	6.921.767	5.421.676	13.957.212
Italia Insulare	131	516	120	767	704.014	3.217.976	2.719.702	6.641.692
Italia	2.596	3.370	2.126	8.092	7.483.925	23.289.847	28.690.872	59.464.644
Composizioni percentuali								
Italia Nord-Occidentale	32,8	33,6	33,6	100,0	15,6	26,3	58,1	100,0
Italia Nord-Orientale	39,0	19,2	41,8	100,0	14,3	21,3	64,4	100,0
Italia Centrale	26,9	68,9	4,2	100,0	9,2	56,4	34,4	100,0
Italia Meridionale	34,4	47,9	17,7	100,0	11,6	49,6	38,8	100,0
Italia Insulare	17,1	67,3	15,6	100,0	10,6	48,5	40,9	100,0
Italia	32,1	41,6	26,3	100,0	12,6	39,2	48,2	100,0

Which mountain?

There is no single definition of “mountain”, nor in Europe, nor in our country

The data just presented change a lot if one use different definitions (ISTAT, Legal, Administrative)

The mountain is in fact made up of many realities with highly differentiated physical, social, economic profiles, in a huge mosaic

But leaving aside the issues of defining and zoning, although important, it is reported that after centuries of more or less uniform evolution, mountain regions now appear to increase their diversification, polarizing in **strongly dynamic areas** and **poor areas**, regardless of the altitude

Development and marginality?

There are, in fact, many positive factors that distinguish mountain areas, but I want to focus now on problems

At the basis of objective difficulties that characterize many mountain areas, numerous limitations are often used to interpret the lack of development, through the pattern of socio-economic marginalization:

“a progressive weakening of the production facilities and resulting loss of income, economic activities, services and the abandonment of the population that triggers a further slowdown” ...

Demography is the base

Relevant demographic data (both absolute and dynamics), are: the % of the working population, the age distribution, schooling, density, etc.

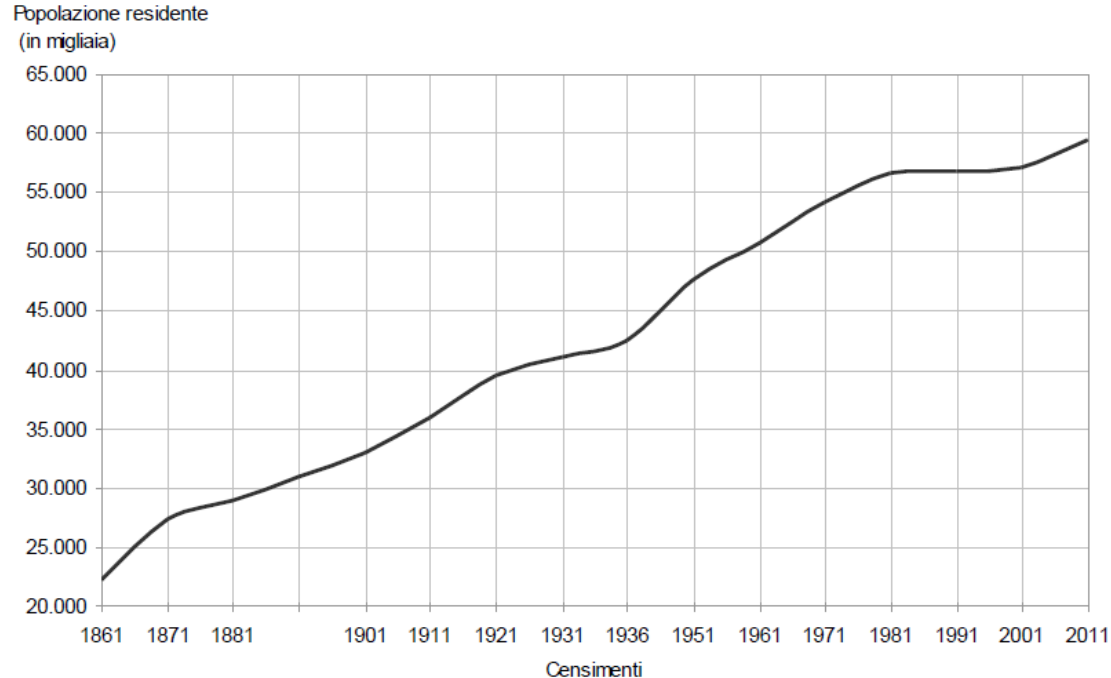
The disadvantage of the mountain is certainly linked to abandonment, which has taken on, since the war, worrying levels: from the population census of 1951 the mountain area has followed a continuous reduction: from 1951 to 1981 the national population grew by 34% while the mountain fell by 7.2%

But in recent years we note an inversion: at the national level such as 2001 to 2011 the mountain population has increased by 133,000 units

le dinamiche demografiche nazionali

Zona	Censimento 2001			Censimento 2011			Variazione decennale	
	Comuni	Popolazione	%Pop	Comuni	Popolazione	%Pop	n Pop	% Pop
M	2605	7'350'365	13,1%	2596	7'483'925	12,6%	133'560	1,8%
C	3370	22'194'646	39,4%	3370	23'289'847	39,2%	1'095'201	4,9%
P	2126	26'760'557	47,5%	2126	28'690'872	48,2%	1'930'315	7,2%
Totale	8101	56'305'568		8092	59'464'644		3'159'076	5,6%

Figura 1 – Popolazione residente ai censimenti dal 1861 al 2011 (primi risultati) Italia ai confini attuali



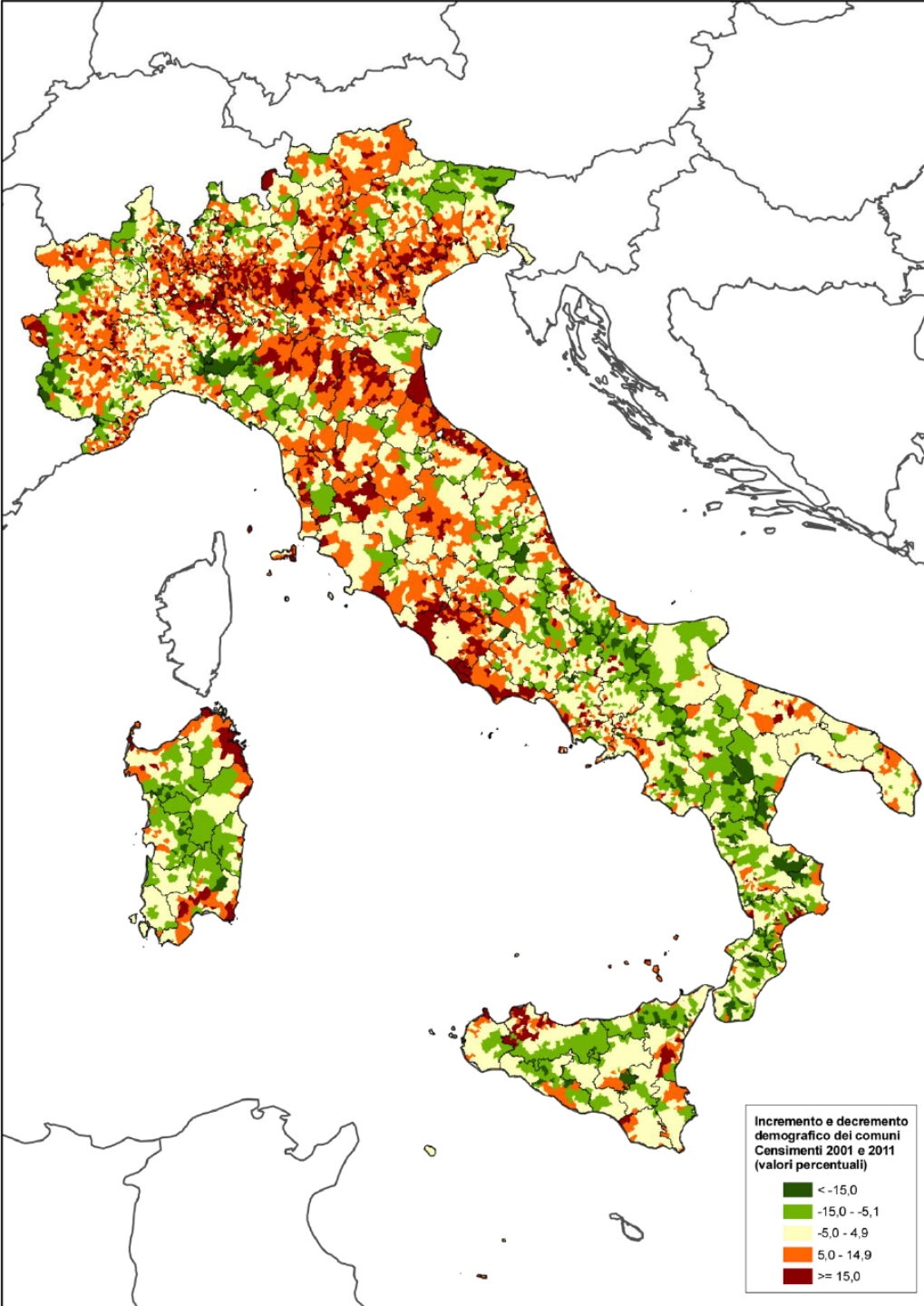
Population dynamics (last two censuses)

The averages obscure a very complex situation ...

The red areas are those where there has been population growth

The green areas have declined (forgive me colorblind people and rational ones)

That's why zoning is so complex and important!



Abandonment

Abandonment is both cause and effect of complex phenomena that occur when a balance is broken. To explain the development or the lack of development we speak of:

- **Physical marginality**, linked to natural constraints and vulnerability;
- marginalization of the **structures of the economy**, (activity rate, employment structure, etc.);
- marginalization of **income and consumption**, availability of services;
- marginalization in the **use of agricultural and forestry** resources (with the constraints in their use), agricultural structures (lower efficiency);
- **networks** and infrastructure nodes
- pressure (positive and negative)
- institutional marginality

Some results

	Piemonte	2000	2010	Differenza
# agr. enterprises	Complessivo	120.863	67.148	-44%
	Montagna	16.878	9.742	-42%
	Resto territorio	103.985	57.406	-45%
Arable land hectares	Complessivo	1.069.565	1.010.780	-5%
	Montagna	278.647	205.798	-26%
	Resto territorio	790.918	804.982	2%
Arable land per firm	Complessivo	8,8	15,1	70%
	Montagna	16,5	21,1	28%
	Resto territorio	7,6	14,0	84%
Working days	Complessivo	24.639.344	18.702.731	-24%
	Montagna	3.192.241	2.378.043	-26%
	Resto territorio	21.447.103	16.324.688	-24%
Working days per hectar	Complessivo	23,0	18,5	-24%
	Montagna	11,5	11,6	-26%
	Resto territorio	27,1	20,3	-25%

Review of main economic concepts

Economy is one of main drivers of development:

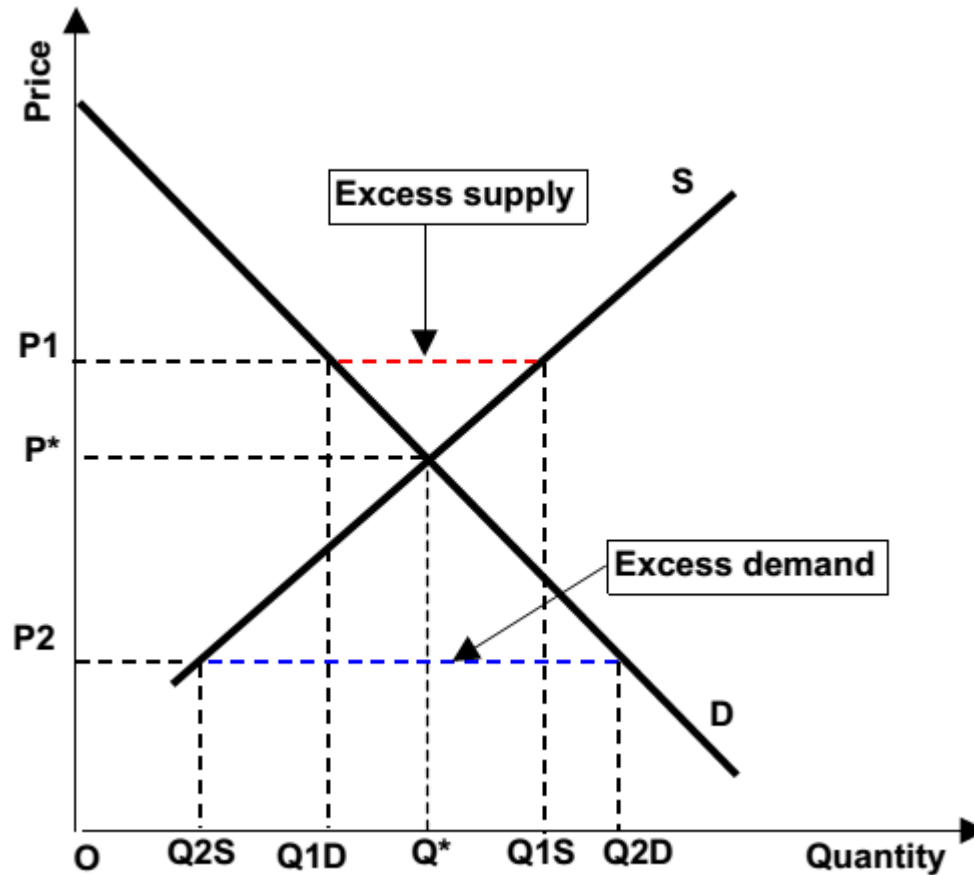
Lets review 2 basic concepts:

- Market equilibrium
- Externalities

Market equilibrium

- On a market goods are exchanged: supply and demand may find an equilibrium
- A market is in equilibrium (and the price is called an equilibrium price) when sellers can sell for that price exactly the quantity they wished to sell, and buyers can buy exactly the quantity they wished to buy for that price, so that there is no tendency to change.

Market equilibrium



Market equilibrium

In a competitive market, at the equilibrium:

- the price, that is equal to consumers' marginal willingness- to- pay, is also equal to producers' marginal cost
- the marginal valuation that society attaches to an additional unit of the good is equal to the additional cost of producing it

Market works well if there are no EXTERNALITIES,
otherwise it fails

Negative externalities

- Negative externalities are costs borne by someone other than the one who produces it (e.g., pollution)
(BTW no zero pollution is possible when producing)
- There is a trade-off between the benefits from production and the damages from production
- The problem of the optimal level of pollution is finding the maximum positive difference between benefits and costs from production

Types of negative externalities produced by agriculture

- Health damages
- Water and air pollution
- Toxic residues in the products
- Esthetic and olfactory damages
- Economic damages
- Lower productivity of other producers (e.g., insecticides damaging honey production)
- Higher costs for others (e.g., polluted water not usable for animals)

Their characteristic

- Mainly non-point sources

(possibly with the exception of stock-raising)

- Implication: uncertainty on responsibility (who), quantity (how much), and the effects (how) it is polluting

- Irreversibility (often)

- Spatial heterogeneity

(even within areas with some environmental homogeneity, like river basins)

Summarizing Negative externalities

- Negative externalities problems arise when private costs differ from social costs
- When operators only consider their private costs, then too much is produced (and hence, too much pollution is produced) relative to the social optimum
- If the operators also considered external costs, they would produce at the social optimum
- This is the basis for the “polluter pays principle”

Positive externalities

- Positive externalities are benefits accruing to some one other than the one who produces them (e.g., soil protection, landscape, CO2 sinking, ecc ecc)
- Which is the level of positive externality that firms would produce spontaneously?

And

- Which is the optimal level of positive externality?

Types of positive externalities produced by agriculture

- Soil protection from erosion
- Recycling of polluting matter
- CO2 abatement
- Biodiversity maintenance
- Agricultural landscape
- Maintenance of traditions
- Reduction of greenhouse gases
-

Positive externalities

- How to reach the optimal level of externalities?
- The conclusion is that, when externalities exist, the market is unable to reach the social optimum
- Intervention is needed to reach the social optimum
- Different measures are possible to correct market failures:
 - Definition of property rights
 - Standards
 - Taxes
 - Subsidies
 - Marketable permits

Which are the effects of agricultural activity on the environment?

A possible classification:

1. Effects on water, soil, air resources
2. Effects on natural habitats (flora and fauna)
3. Effects on the landscape

Another possible classification

1. Direct impacts on human beings
 - a. Health impacts
 - b. Esthetic impacts
 - c. Olfactory impacts
2. Impacts on eco-systems and on ecological mechanisms
 - a. On productivity of ecological systems (agricultural, forestry, fishery productivity)
 - b. Other impacts of the ecological systems (recreation, biodiversity, resilience)
3. Impacts on lifeless systems Soil, water, air, weather conditions

Impacts and externalities

Impacts on environment \neq externality

A negative impact is not necessarily an externality
e.g., a farmer exceedingly exploiting his soil
creates a negative impact on environment, but not
an externality (no one else bears the cost)

Agriculture always has an impact on environment

By its very nature, agriculture modifies the
environment in favor of man

Impacts and externalities

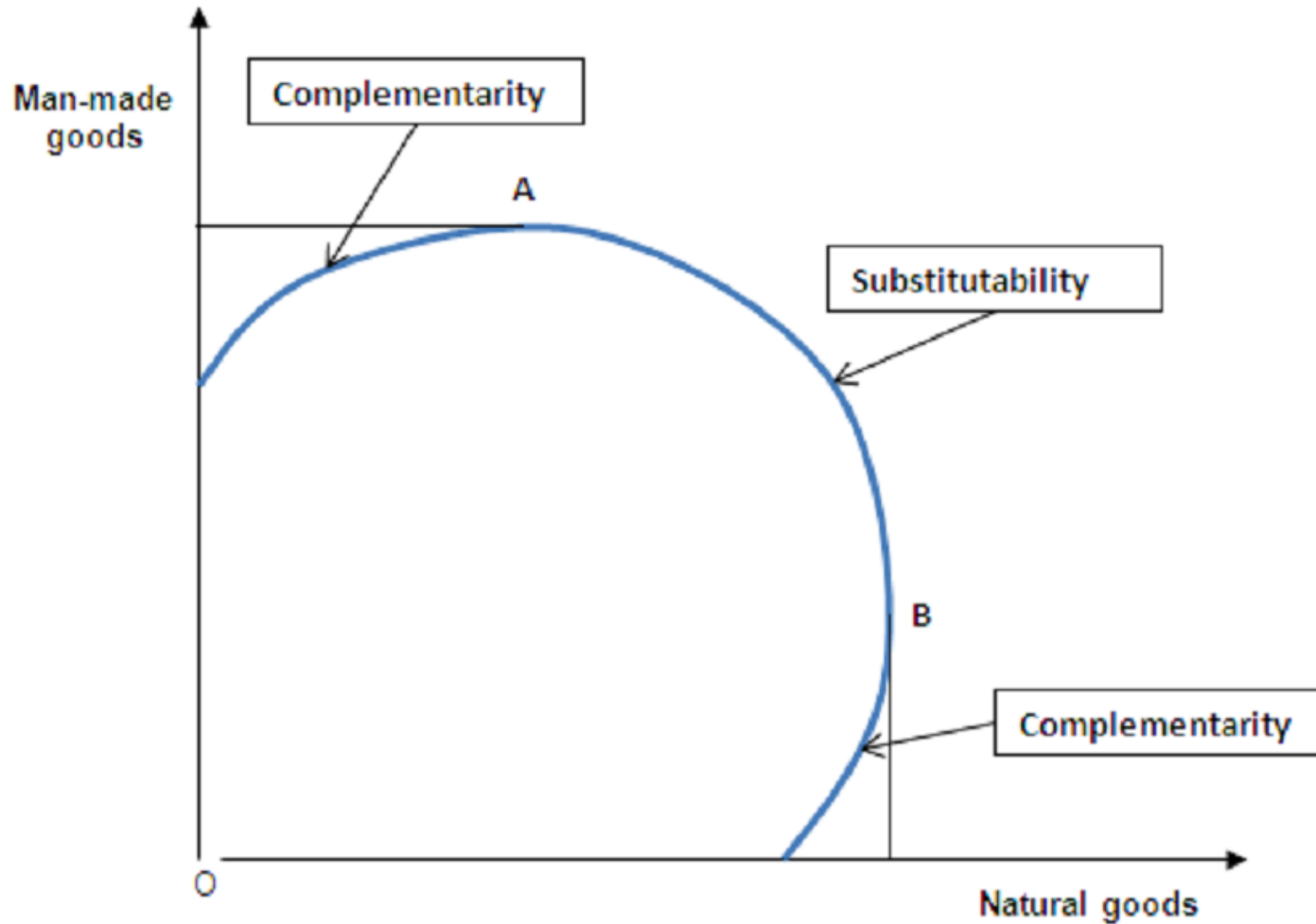
- Modifications of the environment created by agriculture are not necessarily negative
- Man-made goods and natural goods provided by nature may be complements or substitutes
- In most cases, a higher human activity reduces natural goods (e.g., cities and factories)
- But, if natural goods are too scarce, they can render some human activity more difficult (e.g., deforestation in the mountains can create erosion)
- Or, too little human activity (e.g. depopulation) may negatively affect the environment → MAIN PROBLEM

Complements and substitutes

There are, basically, 2 possibilities:

- An increase of natural resources makes production and standard of living increase (complements)
- An increase of production and of the standard of living is only possible with a decrease of natural resources (substitutes)

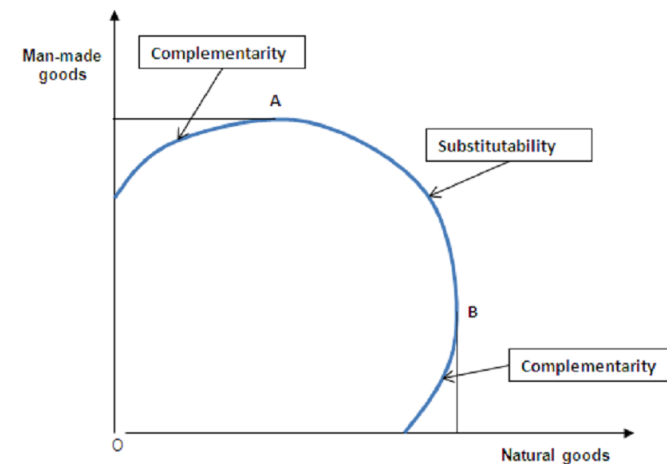
Complements and substitutes



Complements and substitutes

The graph shows the transformation (or possibility frontier) curve, i.e., possible combinations of man-made and natural goods that are possible with the same standard of living

- The top left sector shows a situation where man-made and natural goods are complements because natural goods are too scarce
- The bottom right sector shows a situation where man-made and natural goods are complements because manmade goods are scarce

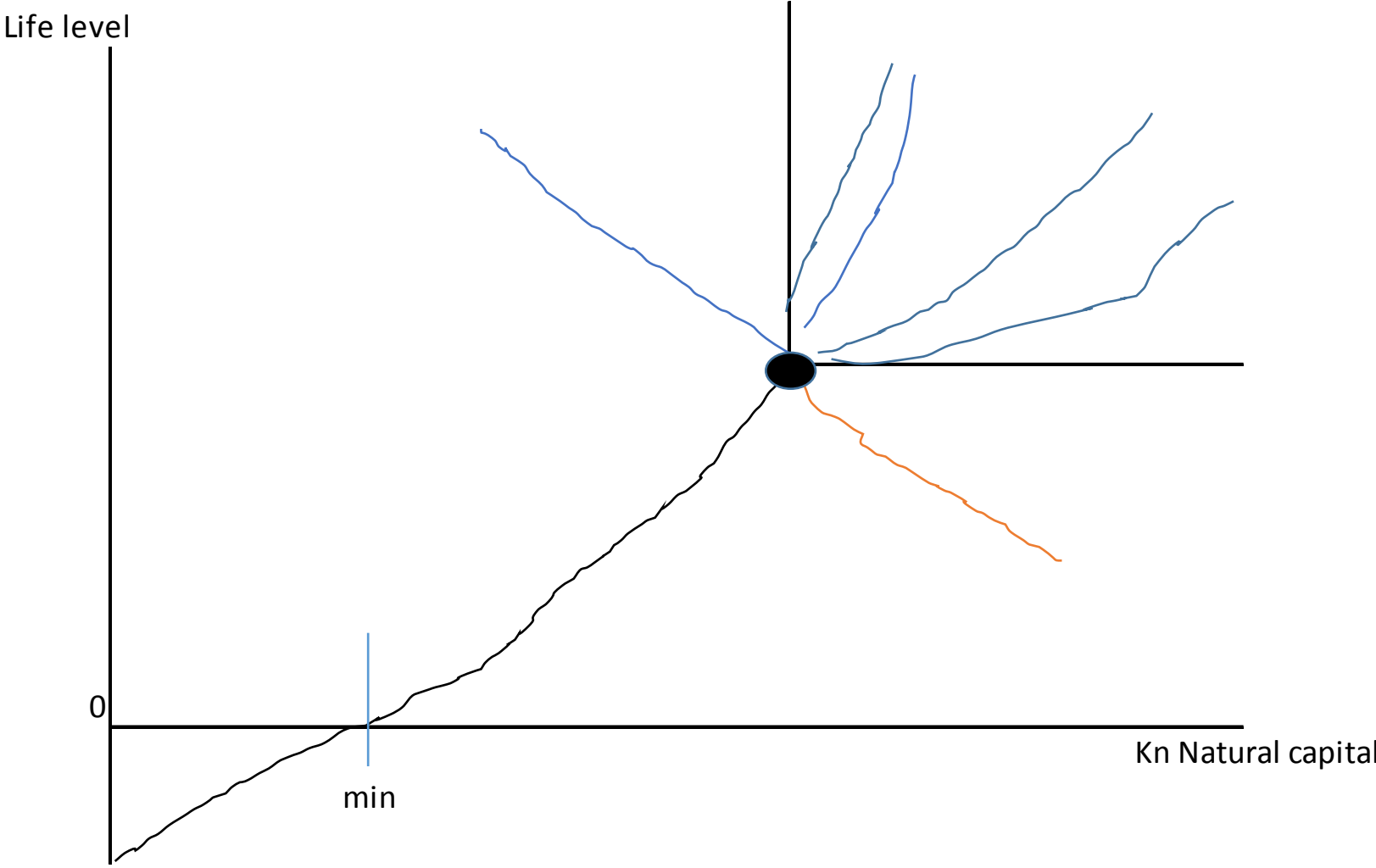


Sustainability

This has ethical implications, specially concerning future generations

- The concept of **sustainable development**: it is such if it satisfies the needs of the present generation without compromising the possibility for future generations of satisfying their needs
- If natural and man-made goods are **complements**, then we can improve our situation and the one of the future generations
- If natural and man-made goods are **substitutes**, then each improvement of our situation decreases the stock of natural resources available to future generations

Sustainability



Mountain Partnership IPROMO – Food security in mountain areas
“Extraordinary potential”, Ormea 25th June 2015

Sustainability

This implies:

- A judgment on what standard of living is (income only, or something else, including environment)
- Also the kind of natural resources should be considered
- Which kind of natural resources should be left?
 - the same physical stock of resources?
 - this is not possible, anyway, for non-renewable resources

Sustainability

- Historically, there has always been a substitution of manmade capital for natural capital:

- Machines for animal draught
- Reclaimed and irrigated soil for wild soil
- Buildings for caverns

Hence:

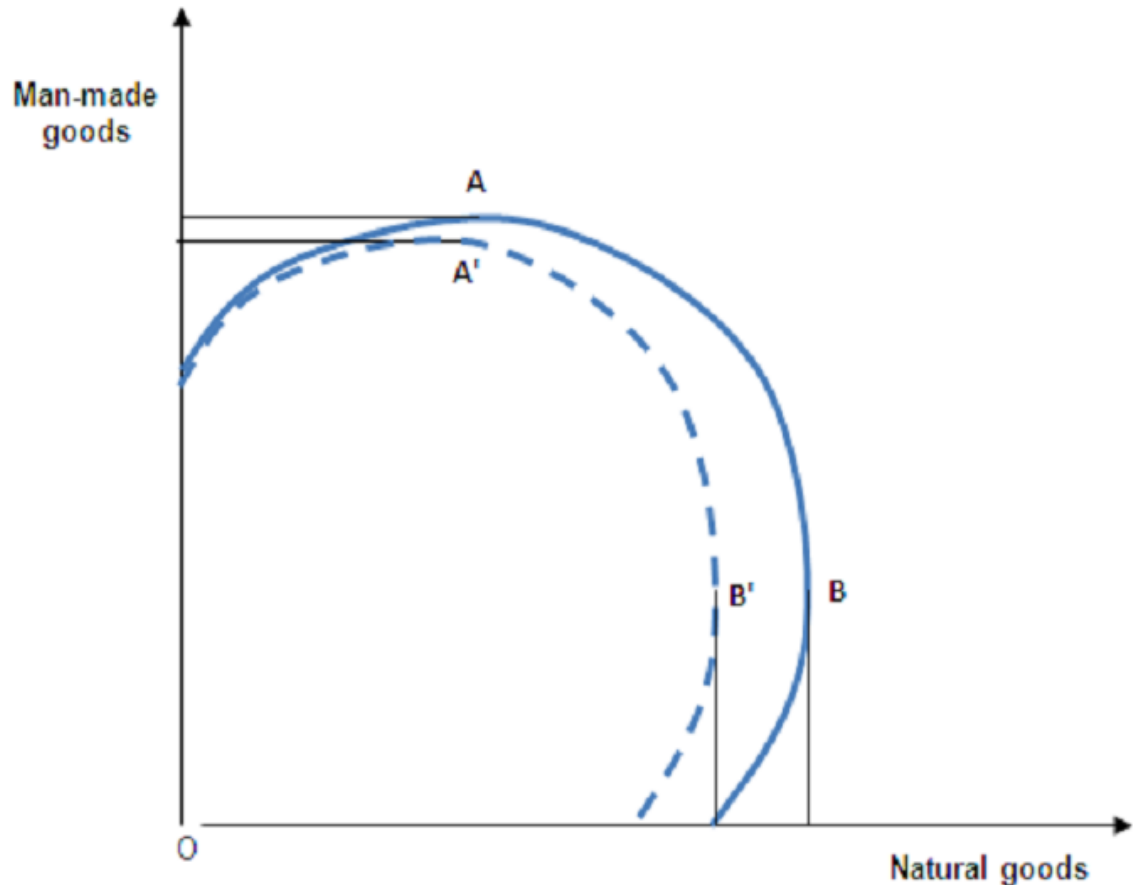
- Possibility to leave to future generations a different composition of resources, that anyway allows the same (or a better) standard of living

Technical progress

- Another source of change is technical progress

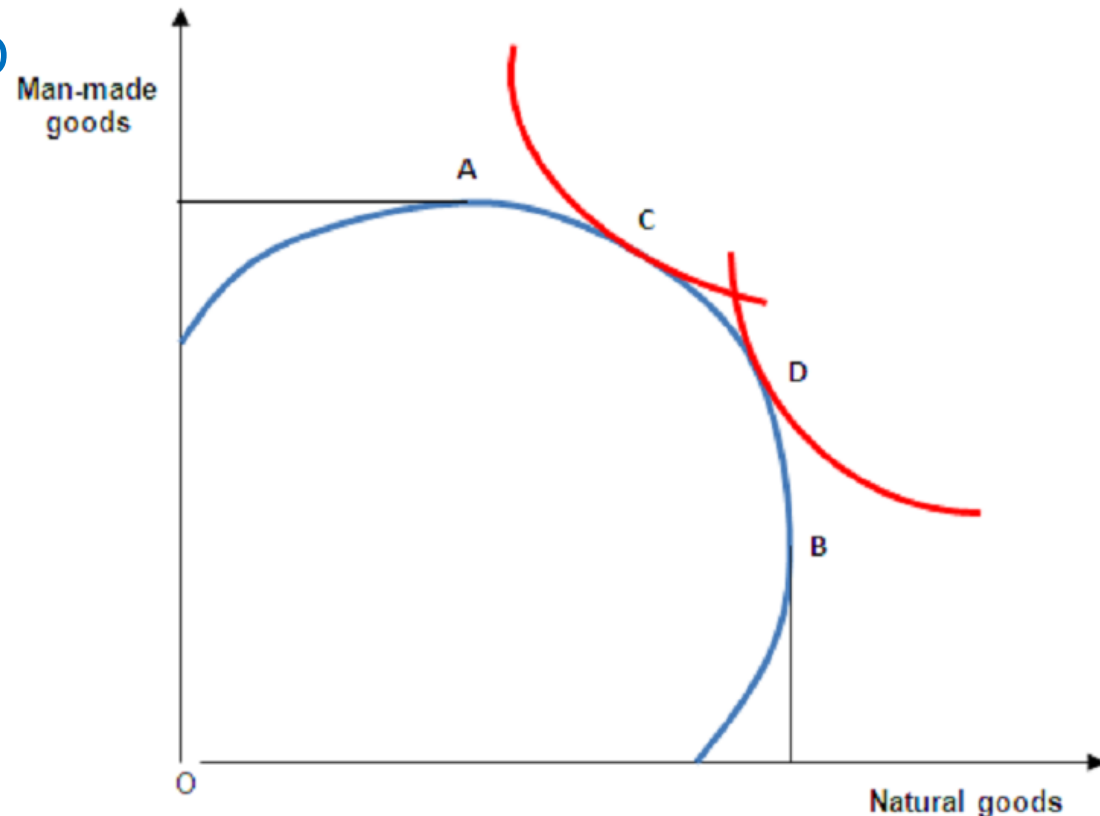
- Technical progress

allows a decrease
in the use of
natural resources
for the same
standard of
living



Preferences

- But the location on the possibility frontier also depends on our preferences
- It is likely that social preferences shift from C to D with increasing income
- This is because natural goods become more scarce, and manmade goods more abundant
- This makes natural goods more preferred



Other factors

- The changing impact of agriculture shift on environment is also determined by technical and economic factors
- These factors determined a radical change from “traditional” agriculture to “modern” agriculture in the last centuries

Characteristics of “traditional” agriculture

- Mainly production for self-consumption
- Rural peasant society
- Mixed types of farming (integration between agriculture and husbandry)
- Techniques:
 - High labor intensity per ha or per animal head
 - Self-production of inputs (seeds, fertilizers)

Characteristics of “modern” agriculture

- Production for self-consumption negligible
- Mixed rural society (pluriactivity)
- Specialized types of farming (separation agriculture - husbandry)
- Techniques:
 - Much lower labor intensity per ha or per animal head
 - Higher yields
 - Machinery
 - Purchased inputs (seeds, fertilizers)

Integration of new functions (transformation, commerce, tourism, teaching,...)

The reason of evolution

A. Biased technical progress

- Labor and land saving techniques
- Increase of energy requirement per unit of output
- Supply of technological packages
- Some parts of the production process brought outside the farm (telephone farming)

B. Changes in relative prices

- Increase in productivity in other sectors → increase of the opportunity cost of labor
- Decrease of machinery and chemical inputs prices
- Scarce land
- More profitable mechanization and intensive use of chemical inputs

C. Agricultural policies favoring production

Effects

Effects of the change also in terms of spatial configuration of agriculture:

- Intensive techniques in the plains (more fit for mechanization)
- Extensive techniques in the hills and in the mountains
- Concentration in the number of farms
- Particularly for stock-raising (economies of scale)

Tools

Are there incentives for farmers to environmental stewardship?

- Traditionally farmers developed functions of environmental conservation

Are there incentives for farmers to environmental stewardship?

Farmers have incentives to protect the environment if protection:

A. Directly affects farmers' utility

- Health, relative to use of chemicals
- Amenity of agricultural environment for farmers

B. Directly affects farmers' income or assets

- E.g., soil conservation.
- Only true for certain property right systems (ownership or long-term tenancy)

C. If production and environmental quality are complements

- Organic products
- Agro-tourism

Externalities and multifunctionality

- Externalities (specially positive ones) produced by agriculture are at the basis of MULTIFUNCTIONALITY

In rigorous terms (OCDE, 2001), multifunctionality exists when:

- Agriculture jointly produces market and nonmarket goods
- Some nonmarket goods are public goods

Public goods connected to multifunctionality

- Landscape
- Territory conservation
- Sustainable management of renewable natural resources
- Biodiversity conservation
- Conservation of the socio-economic fabric in rural areas
- (inclusion of food safety and of employment in rural areas is questionable)

Mountain Partnership IPROMO – Food security in mountain areas

“Extraordinary potential”, Ormea 25th June 2015

Problems with multifunctionality

- Political:

the implication is that farmers should be compensated for positive externalities But this is often only a justification for subsidizing agriculture

- Management:

the justification of subsidies stems from Social Net Benefit considerations

- But the policy maker should consider the most efficient way to reach the Social Benefit

Problems with multifunctionality

- Therefore, the policy maker should:
- Verify if paying the farmers consider the most efficient way to reach the Social Benefit
- Verify if the production of externalities is actually joint with market products and if economies of scope (= a decrease in costs when several different outputs are produced) exist
- Pay the farmers relative to the produced externalities

A Study case

FOREST MANAGEMENT

Starting points

Italian forests are largely neglected or under-utilized

In Italy forest management is under the responsibility of **Regions**

In Piedmont only 5% of woods have an effective (=in force and active) management plan

It is widely accepted that **without an economic interest** there is **no management** and, with a short circuit, less management means less production and revenues

But also lower levels of **public services** rendered by the forest:

when we refer to forests whose structure, density and composition are strongly marked by centuries of human presence and activity, **management is required** to ensure their stability

Starting points

The improvement of timber production doesn't automatically imply an improvement of forest services, because public services and timber production are not **joint products** (*two outputs generated simultaneously by a single process using common input*),

Timber incomes are helpful (or even necessary), both for managing protection forests and for grant structural investments

Otherwise, only public actors can provide such services

But owners and managers are asked more and more to provide services to society: this is not possible unless they receive an appropriate compensation of such services

A national synopsis

Italian forests =

- **Heterogeneity** (Boreal, Alpine, Mediterranean)
- **Mountain forests > 90%**
- Forest Cover = **10,5 M** hectares (8,7 forests+1,7other stands) (IFNC 2005)
- **Expansion** (ab. 3Mha in 1920, 5 Mha in the 1950)
- 3 Mha under “*natural conversion*” to forest
- 2/3 are **coppices** (fuelwood)
- **Growth 35.9** Mm³/y (4.1 m³/ha/y) (2004)



From: <http://www.sian.it/inventarioforestale/img/cartogrammi/proprieta.jpg>

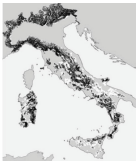
Total wood production 8.7 Mm³/y (Agri-ISTAT 2008)

ab. 5.6 Mm³ fuelwood / ab. 3.1 Mm³ industrial wood

Strong industry consumption (40-45 M m³/y) → **75% of wood imported** from anywhere and in anyway

Furniture 2nd world exporter >400'000 employed in 90'000 firms, 39.77 Bill€ industrial turnover (2008) = 2.6% of Italian GNP

Forest focused and forest related policies



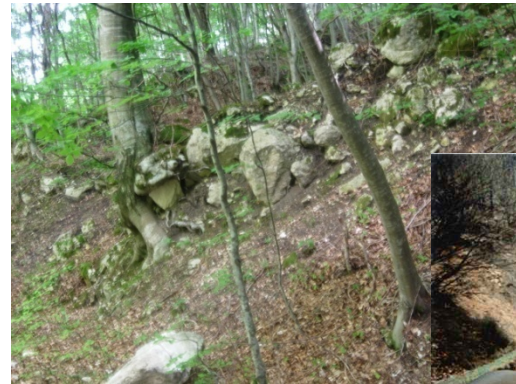
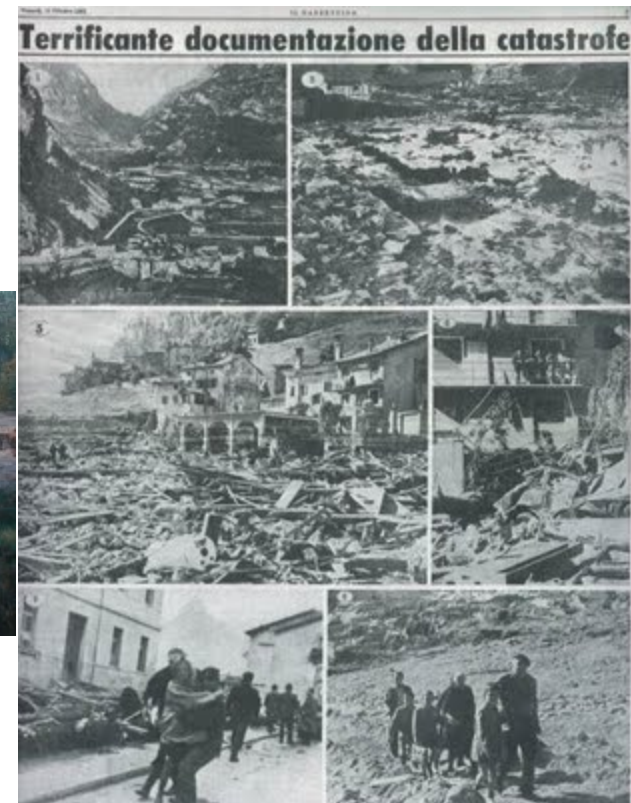
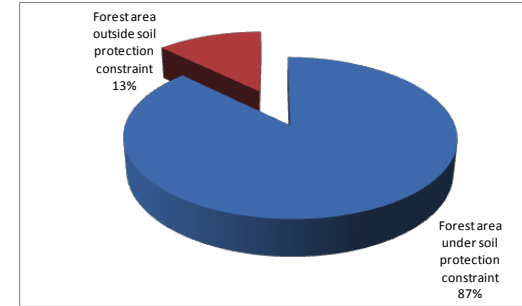
Forest relate policy:

Hydrogeological protection of national territory

Tool:

Law 3267/1923, Law 1126/1926

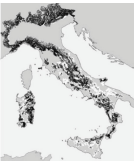
Forest and forest management are seen as tools to ensure soil protection from disaster, erosion and guarantee an orderly flow of meteorological water



Main rules:

- release of plants in the cutting area;
- absolute ban for roots eradication;
- minimum age of the plants for final cutting;
- absolute ban on the activity of grazing areas used before the natural regeneration has not been established;

Forest focused and forest related policies



Forest relate policy:

Landscape

Tool:

Law 1497/1939; law 42/2204; landscape constraint

Forests are a significant component of the landscape and they are able to characterize specific places and / or extensive areas. All Italian forest are under the landscape constraint

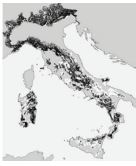


Main rule:

-ban of change of the forest land in other land use;



Forest focused and forest related policies

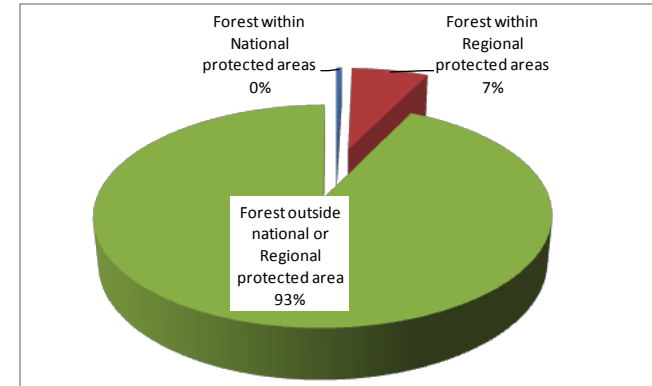


Forest relate policy:

Biodiversity (protected areas)

Tool:

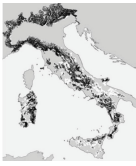
Law 394/1994 and other regional laws



Main rule:

- special authorization (nulla osta) after verifying the compatibility of the silvicultural activity with the protection objectives of the protected area;

Forest focused and forest related policies

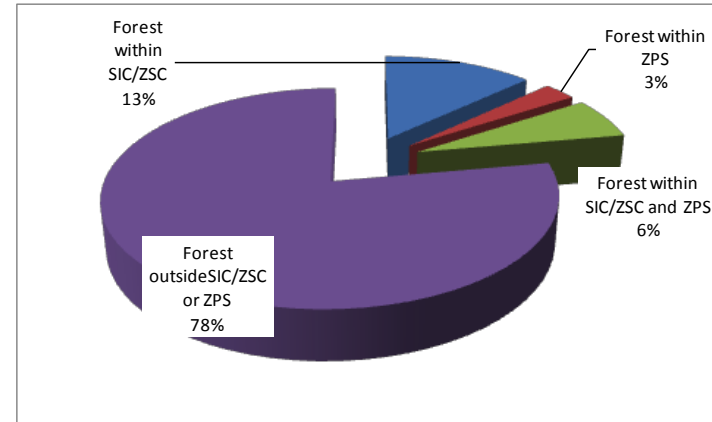


Forest relate policy:

Biodiversity (European Ecological Network Natura 2000)

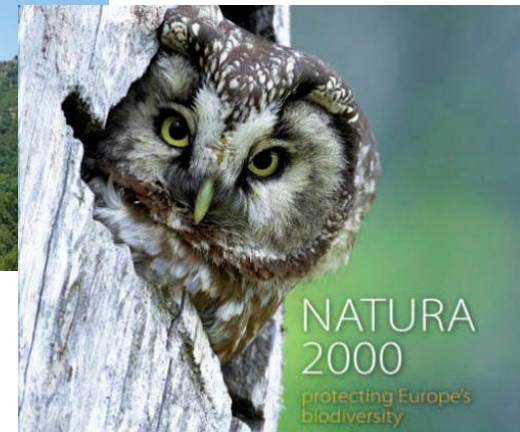
Tool:

Directive 42/92/CE; Directive 409/79/CE



Main rule:

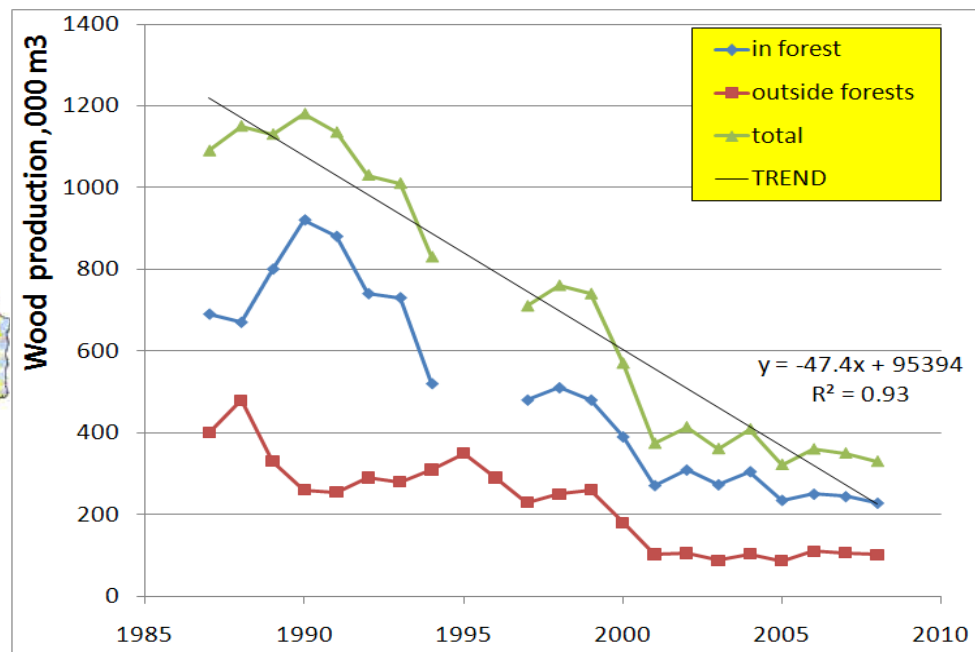
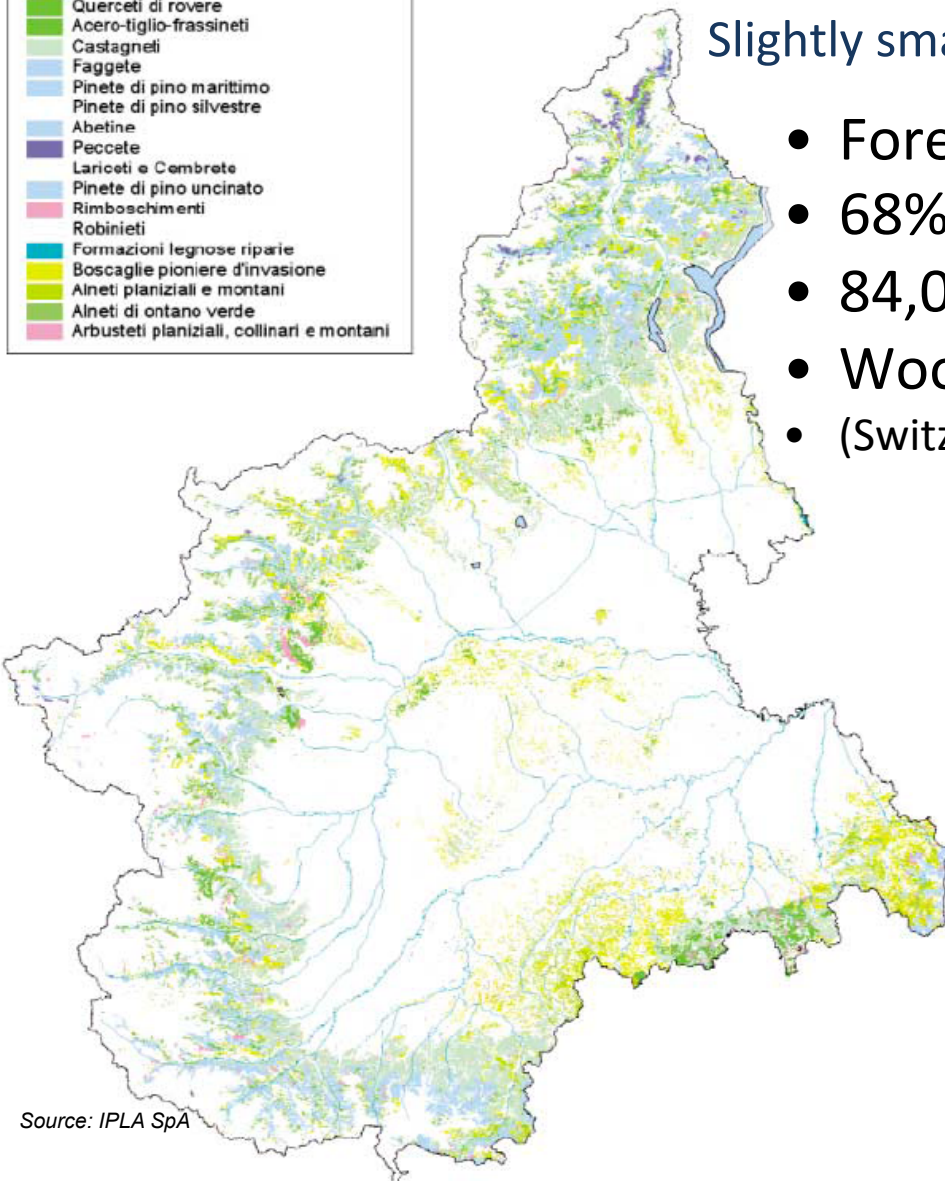
- reduce noise, especially during the breeding period of the species;
- use appropriate tools and techniques with low environmental impact;
- protection of plants that serve particular environment functions (habitat);



An outline of Piedmont forests

Slightly smaller than Switzerland (1,2Mha of forests)

- Forests surface **0,9 - 1 Mha**
- 68% private - 28% municipalities
- 84,000 farms with forests < 4 ha/farm
- Wood production (2008) **330,000 m³**
- (Switzerland timber production –FAO, 4.6 Mm³)

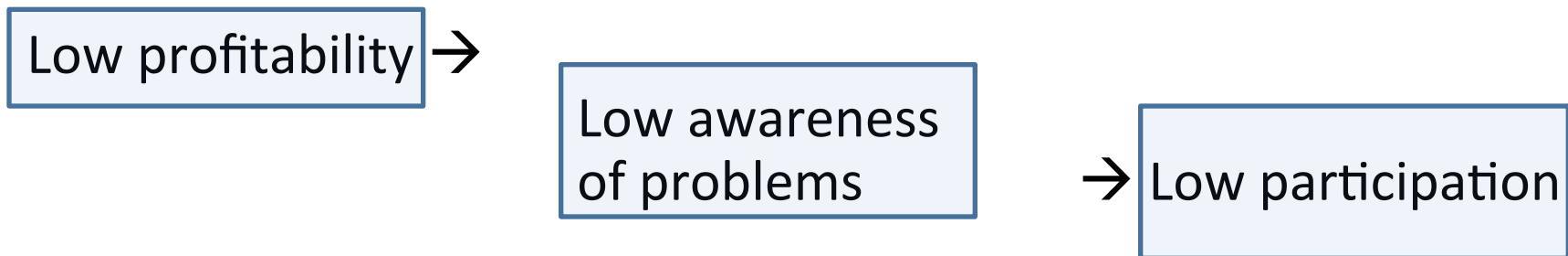


Source: ISTAT

Several factors contribute to the “inertia” of private forest actors

The primary cause is the **poor competitiveness** of domestic production of timber in a globalized market

- fragile land structure (mountain)
- fragmentation of supply (parceling out of estates)
- lack of structures/infrastructures
- reduced convenience of management (timber prices vs costs dyn.)
- lack of integration in the wood-chain
- lack of cooperation in trade
- ...



Italian forests (in small doses – last)

- Weak structure of owners with a very inadequate land property due to the parceling out of estates
- Different situations but a common decline of management
 - Management based on top-down approach and binding force of laws
 - National forestry law dates 1923: that's history!
 - Devolution in 1977: forestry become Regional competency
 - Federal administrative structure, with some Regions very active (but overlapping competencies with the State)
 - Low participation, low profitability, low awareness of the problems
- New demands and new services by citizens but only few and scattered answers

Coppices: a legacy of the past

Only in coppices levels of wood removal remain relatively high, satisfying a local demand, where forests are more accessible

But official statistics are unable to estimate the production of fuelwood, which is largely underestimated: at national level recent studies approximate removals at 27-33 Mm³, which are 6-8 times the official data

Coppices are a real legacy of the past, when they totally meet the need of Italian families: small land parcels, easily managed with simple tools, with no other capitals but an axe and a mule

They remains today an interesting activity for agricultural farms, integrating agricultural revenues

But today Italy is the first world importer of fuel wood and the third of wood chips!

From the “public side”

All the economic activities associated with forest management **largely depends on public**

- Despite ownership of forest lands is for 2/3 private and
- Despite timber market characteristics

No significant intervention in the forest management can be performed without a written warrant or license, granted by authority

The reason is linked to the **public nature** of services provided by forests in a **fragile territory** : managing forests means take care of mountains

Therefore, also policies for forest management are essentially public policies

The key question

- Some crucial issues
 - Increasing wood stocks (& increasing biodiversity)
 - Loss of revenues and employment, structural importations
 - Forest fires
 - Natural services not granted
 - Abandon: more than 50% of Italian forest surface is neglected!
- We can not change the structure of Italian forests but we must try to find solutions to **assure their management** and the consequent protection of mountain territory

As a result

Unfortunately, all mentioned structural factors interact within an inadequate **legal framework**, with traditional policies based on **binding** regulations

When goals like *forest sustainability* are so broad and “ambiguous” then political choices of priorities must give a strategic direction: so, the State (Regions today) decided to ensure public services protecting forests **against** users and not managing **with** them

This is an obsolete vision, which reduces the efficiency of the sector: strong structural limits interact with an obsolete public action, causing a **progressive and unstoppable** abandonment of agriculture and forestry in many hilly and mountain areas

Consequences can be considered in terms of revenues, workplaces, services themselves, and significant changes in the land use

Changes are not straightforward

“*Le bois avance*” (“wood goes-ahead”) is a French famous slogan, which is true for our woods also, but not for our institutions:

- The National forestry law dates 1923 and it's still in force
- Despite some recent decrees, which reorganise the sector, and many draft laws, a national framework law still lacks
- In 1977 forestry become of Regional competency, with a federal administrative structure
- Some Regions are very active, other ones are not, with different levels of actors participation and different budgets
- Overlapping competencies with the State: forest policies are Regional but environmental ones are National

Lesson learned

- The strategies to guarantee an effective supply of forest products and services requires appropriate **business skills** and the presence of a structured business services
- There is a growing attention to the territory area and the plurality of functions of the forest
- There is an emerging demand of a public-private cooperation, giving an **entrepreneurial character** to services producers (payment for environmental services)
- Revenues of different services **compensate** each others: under this perspective, even coppices can contribute to develop a local economical system
- But there is not a clear answer to help the sector in this direction

Final consideration

- Italian forests have strong structural limits, mainly due to their location in mountain areas and a weak owner structure, which, combined, reduce the entrepreneurial ability of the sector
- The negative trends of forest management profitability is worsen by a poor public action, with a traditional and obsolete vision of forest management and a lack of structural programs.
- Owners are demanded to provide more and more services to society but this is not possible unless they adopt optimal management tools and receive from society (never mind in which form, from state-financer or from citizen-payer) a correct compensation of such services.

Final consideration

- This goal demands a public-private cooperation, giving an **entrepreneurial character** to services producer (payment for environmental services) and helping them to reduce the public expense with suitable tools
- The forest management itself it is an obsolete notion because we must think to a new territory and services management with a more contractual and less restriction-based policy
- Integration and valorisation with a market-oriented management is the key-solution, where revenues of different services compensate each others
- This will permit to let the public action to reach the targets which really need help,
- Otherwise, even big consortia will not survive if private and public will not do their best to help each other.