North-East Asia Development Cooperation Forum 2017

28-29 September, Moscow

"Mobilizing intellectual potential of Eurasian countries for mitigating, preventing and/or reversing damage to environment"

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JAPAN

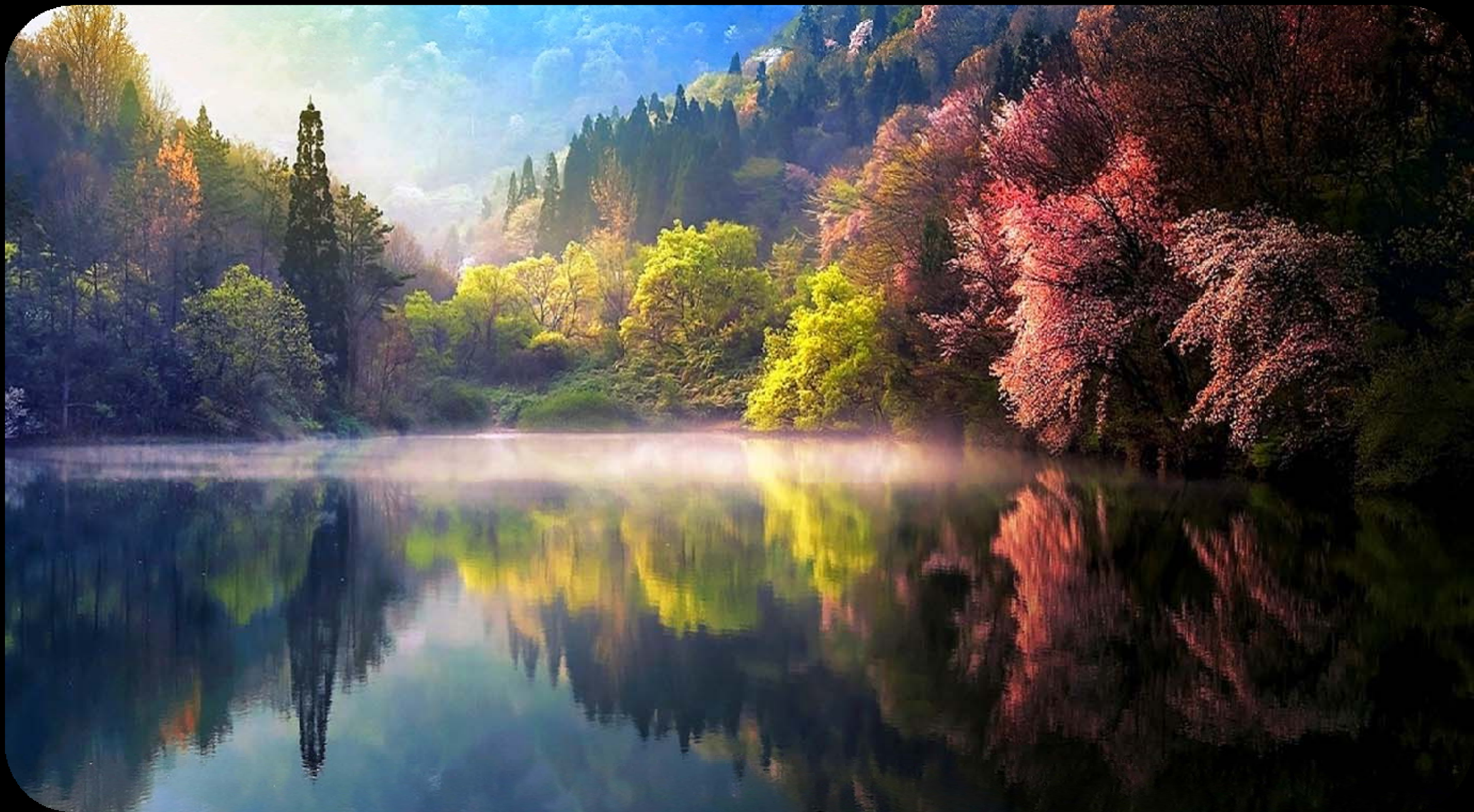
CHINA




Yangtze River

North Korea

South Korea



RUSSIA

Amur River

CONTRIBUTION OF NATURAL RESOURCES TO GDP (% of GDP, 2015)

	Total natural rents	Oil rents	Natural gas rents	Coal rents	Mineral rents	Forest rents
China	1.3	0.3	0.0	0.4	0.5	0.1
Russia	10.3	5.6	3.2	0.3	0.9	0.3

Source: The World Bank. World development indicators 2017

OUR FORESTS

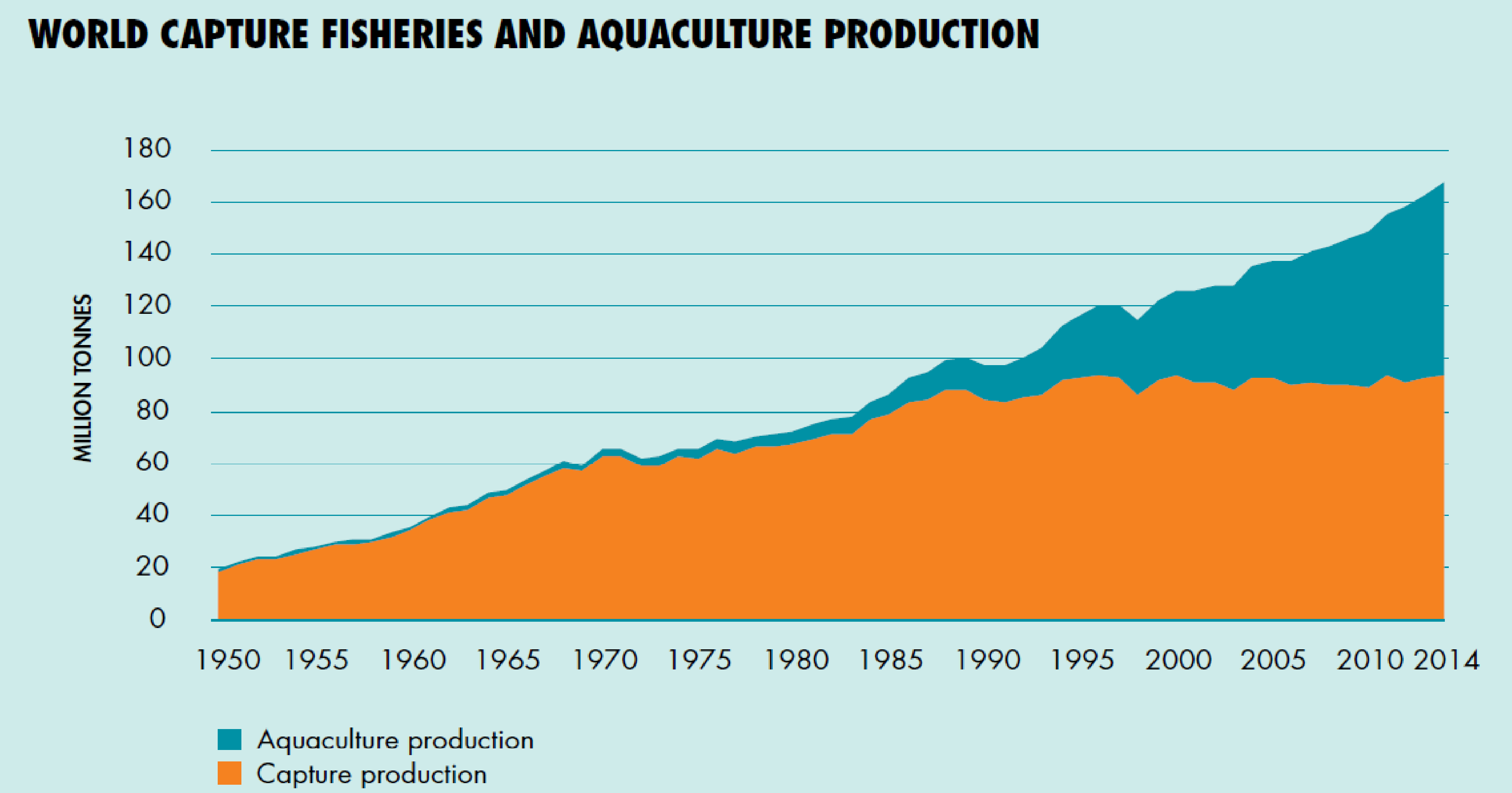
Deforestation

	Forest area		Average annual deforestation	
	sq. km thousands		%	
	1990	2015	1990-2000	2000-2015
China	1,571	2,083	-1.20	-1.09
Japan	250	250	0.03	-0.02
Korea, Dem. People's Rep.	82	50	1.67	2.12
Korea, Rep.	64	62	0.13	0.11
Russian Federation	8,090	8,149	0.00	-0.05

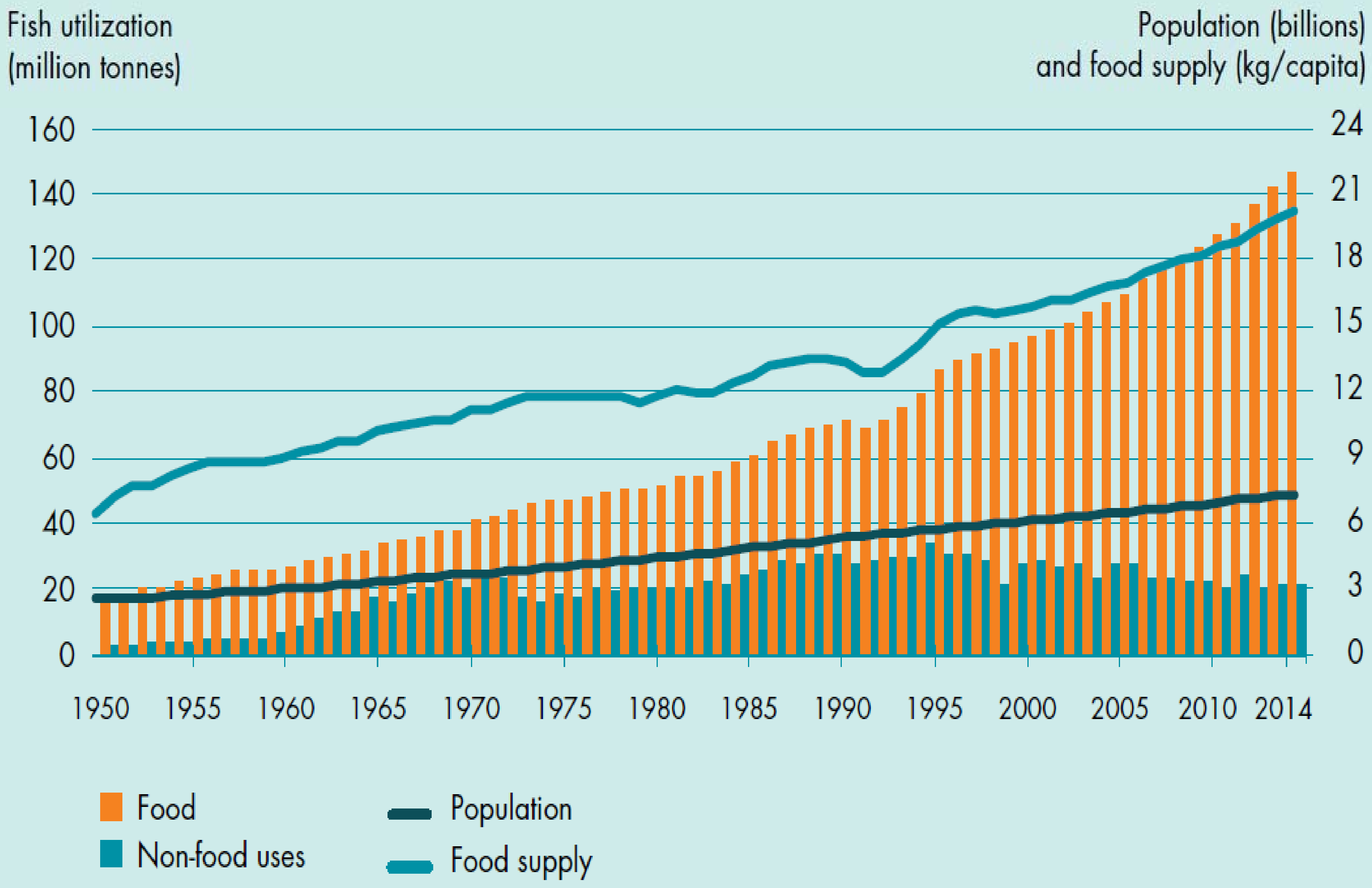
OUR RIVERS

OUR SEAS

OUR SEAFOOD


WORLD CAPTURE FISHERIES AND AQUACULTURE PRODUCTION
MILLION TONNES
180
160
140
120
100
80
60
40
20
0
1950
1955
1960
1965
1970
1975
1980
1985
1990
1995
2000
2005
2010
2014
Aquaculture production
Capture production

WORLD FISH UTILIZATION AND SUPPLY



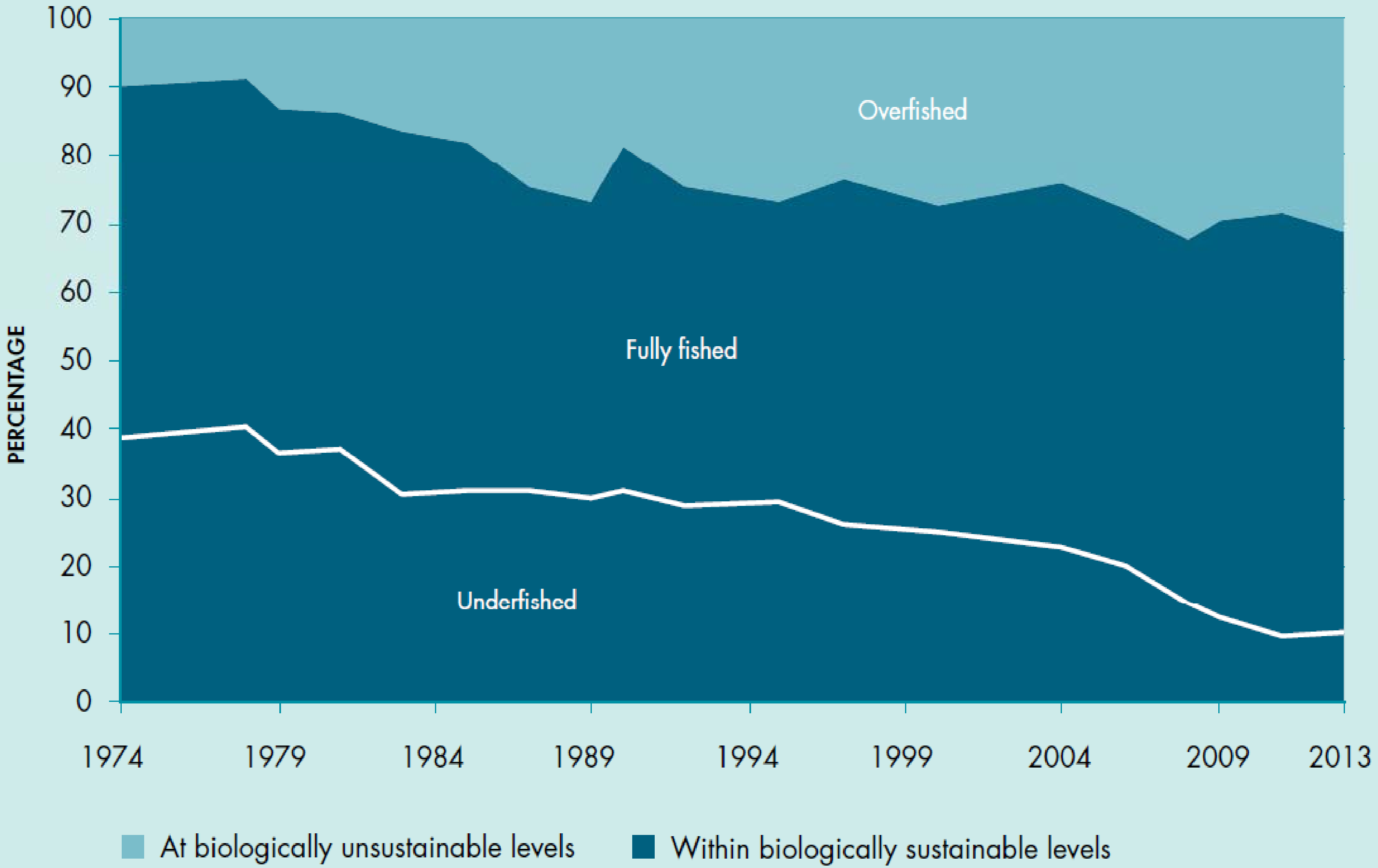
WORLD FISHERIES AND AQUACULTURE PRODUCTION AND UTILIZATION

	2009	2010	2011	2012	2013	2014
	(Million tonnes)					
PRODUCTION						
Capture						
Inland	10.5	11.3	11.1	11.6	11.7	11.9
Marine	79.7	77.9	82.6	79.7	81.0	81.5
Total capture	**90.2**	**89.1**	**93.7**	**91.3**	**92.7**	**93.4**
Aquaculture						
Inland	34.3	36.9	38.6	42.0	44.8	47.1
Marine	21.4	22.1	23.2	24.4	25.5	26.7
Total aquaculture	**55.7**	**59.0**	**61.8**	**66.5**	**70.3**	**73.8**
TOTAL	145.9	148.1	155.5	157.8	162.9	167.2
UTILIZATION[1]						
Human consumption	123.8	128.1	130.8	136.9	141.5	146.3
Non-food uses	22.0	20.0	24.7	20.9	21.4	20.9
Population (*billions*)	6.8	6.9	7.0	7.1	7.2	7.3
Per capita food fish supply (*kg*)	18.1	18.5	18.6	19.3	19.7	20.1

Note: Excluding aquatic plants. Totals may not match due to rounding.

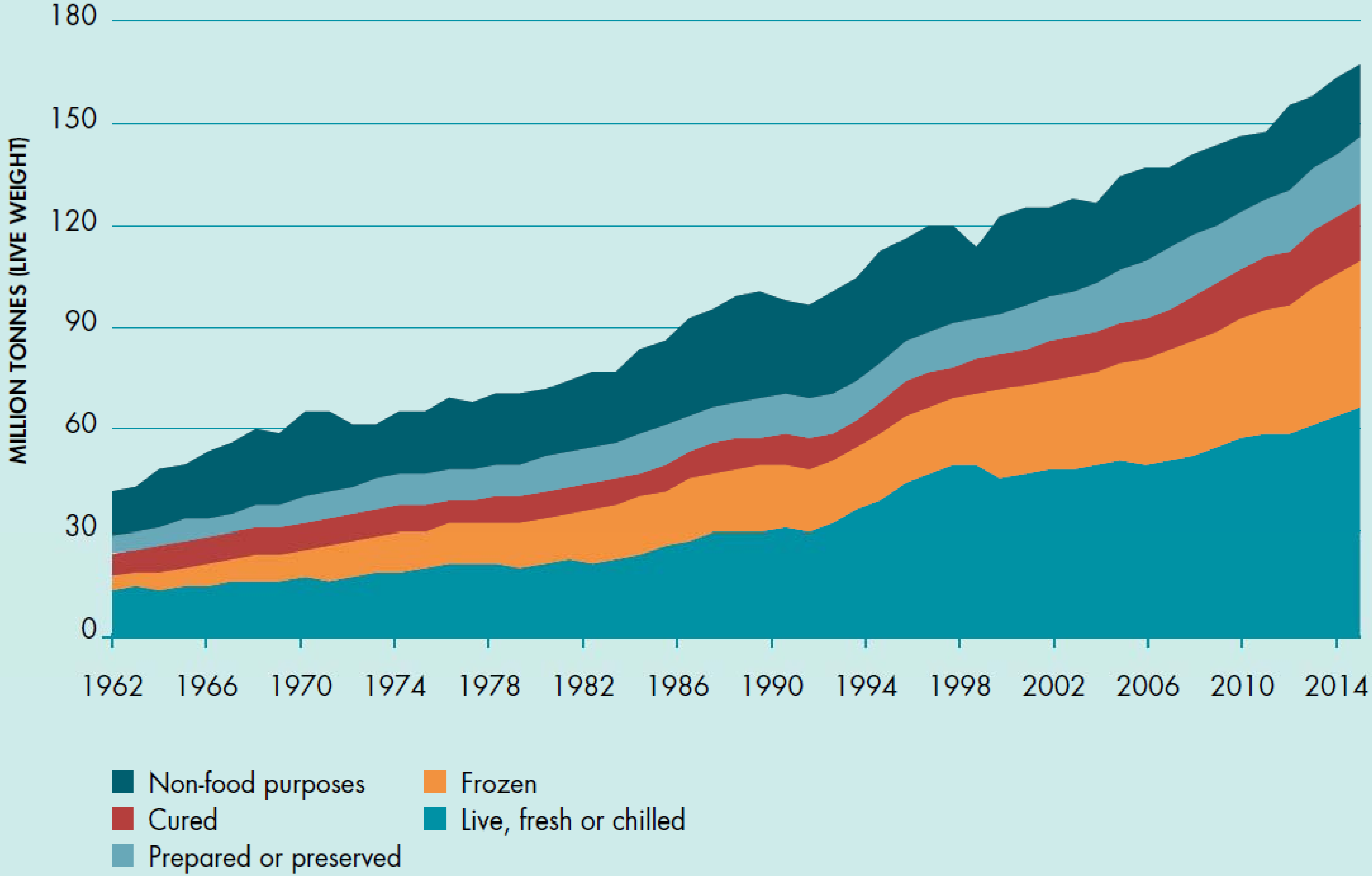
[1] Data in this section for 2014 are provisional estimates.

GLOBAL TRENDS IN THE STATE OF WORLD MARINE FISH STOCKS SINCE 1974



Notes: Dark shading = within biologically sustainable levels; light shading = at biologically unsustainable levels. The light line divides the stocks within biologically sustainable levels into two subcategories: fully fished (above the line) and underfished (below the line).

UTILIZATION OF WORLD FISHERIES PRODUCTION (BREAKDOWN BY QUANTITY), 1962–2014



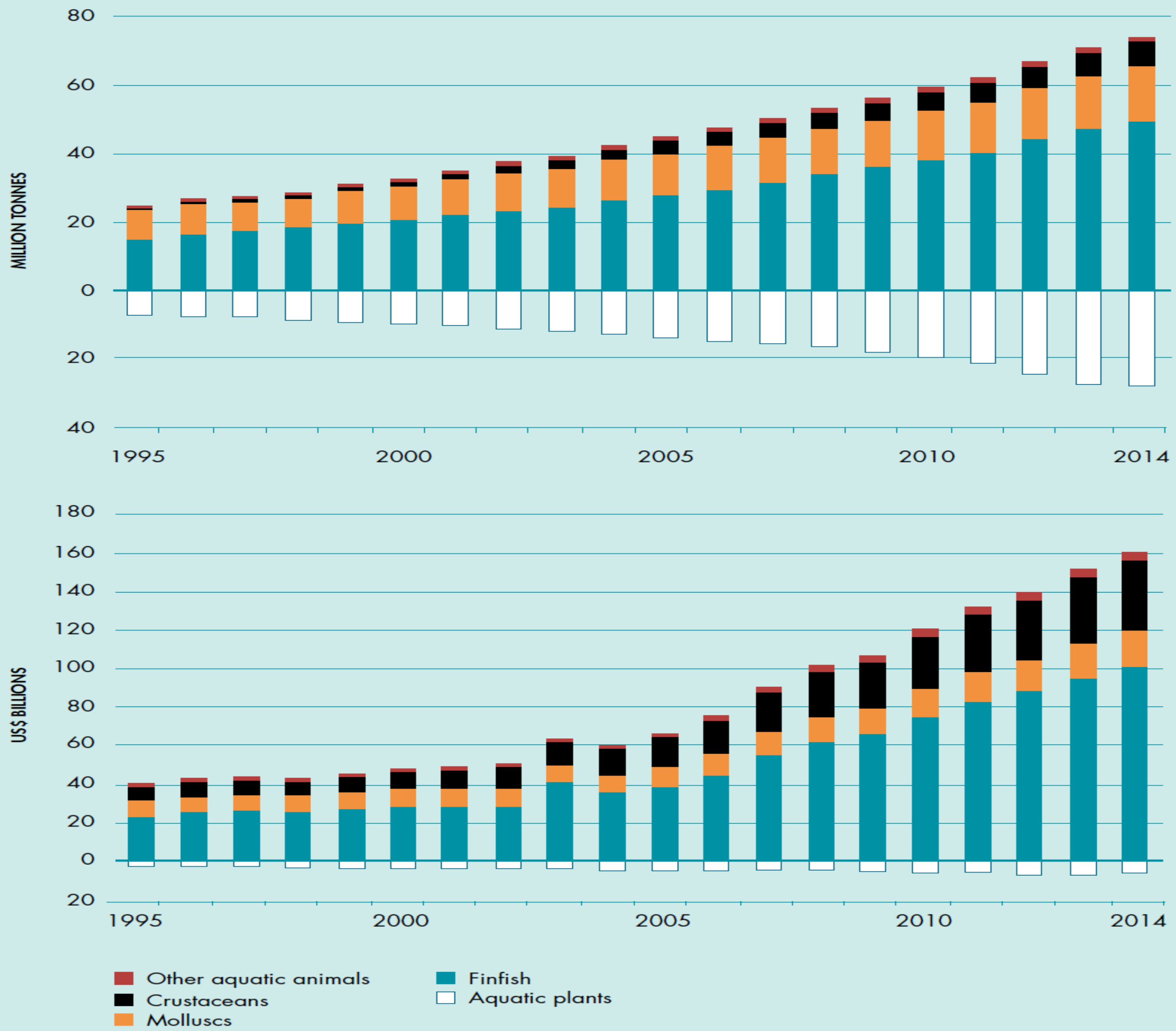
MARINE CAPTURE PRODUCTION: MAJOR PRODUCERS

COUNTRY OR TERRITORY	AVERAGE 2003–2012	2013	2014
		(Tonnes)	
CHINA	12 759 922	13 967 762	14 811 390
JAPAN	4 146 622	3 621 899	3 630 364
REPUBLIC OF KOREA	1 736 680	1 586 059	1 718 626
RUSSIAN FEDERATION	3 376 162	4 086 332	4 000 702
WORLD TOTAL	80 793 507	80 963 120	81 549 353
SHARE OF 4 COUNTRIES IN WORLD TOTAL MARINE CAPTURE	27,6%	28,8%	30,2%

INLAND WATERS CAPTURE PRODUCTION

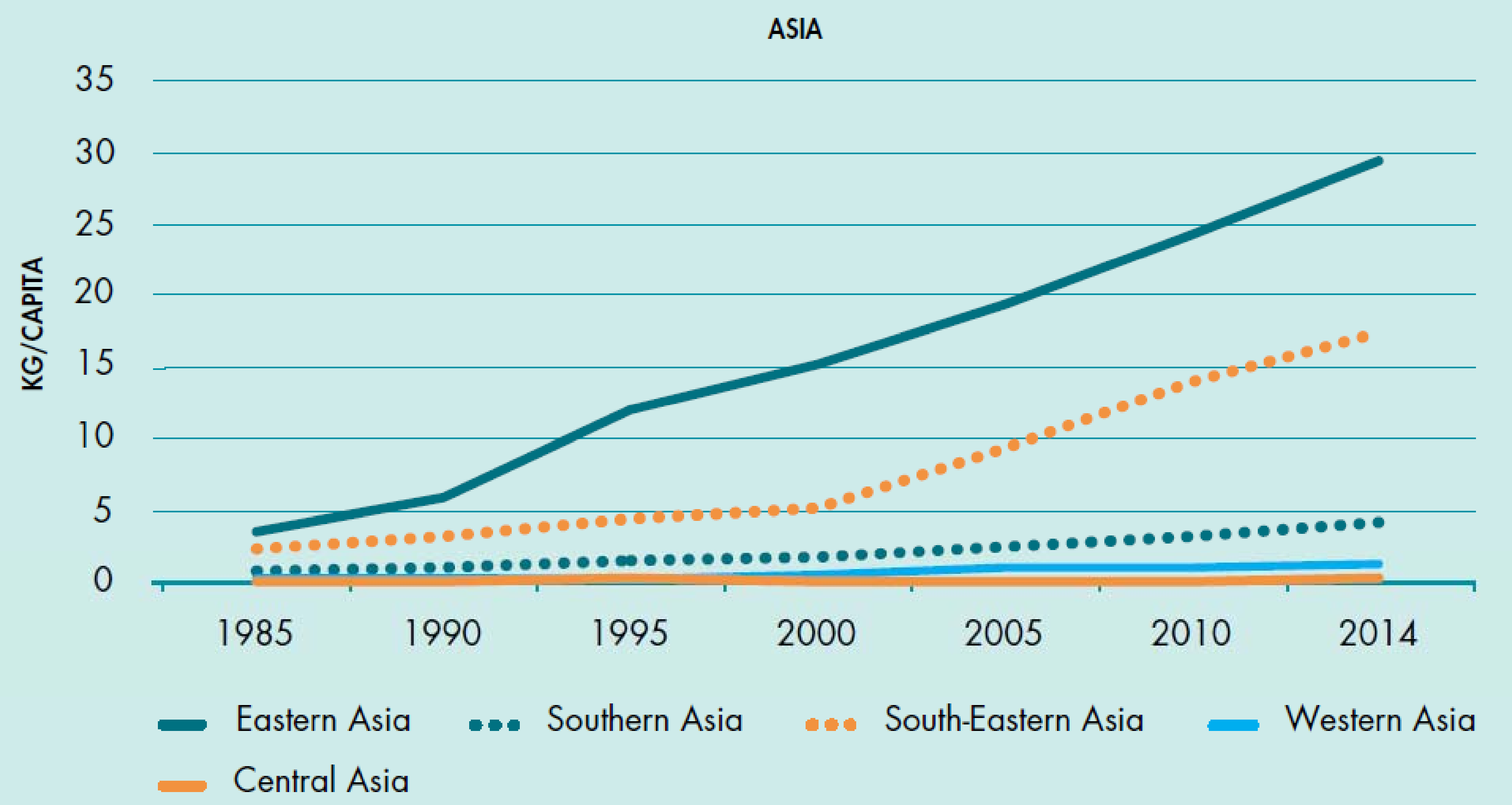
COUNTRY	AVERAGE 2003–2012	2013	2014
		(Tonnes)	
CHINA	2 215 351	3 307 162	2 295 157
RUSSIAN FEDERATION	228 563	262 050	224 854
WORLD TOTAL	10 130 510	11 706 049	11 895 881
SHARE OF 2 COUNTRIES IN THE WORLD TOTAL INLAND PRODUCTION	23.7%	30%	21%

WORLD AQUACULTURE PRODUCTION VOLUME AND VALUE OF AQUATIC ANIMALS AND PLANTS (1995–2014)



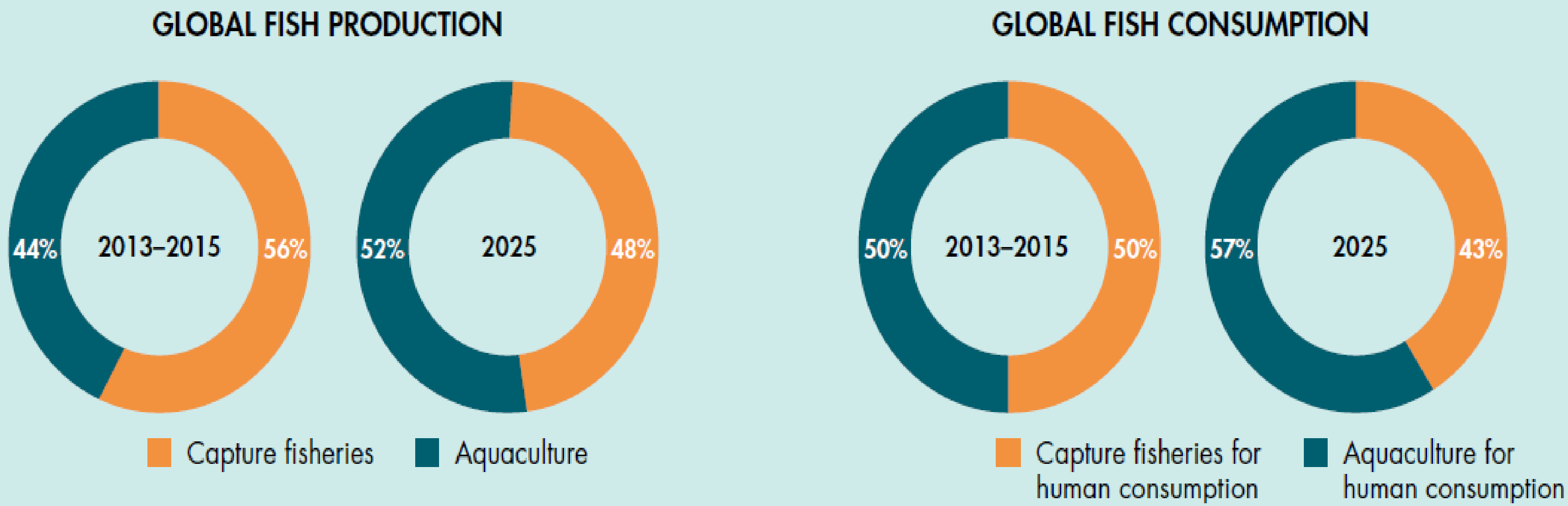
Measured at the national level, 35 countries produced more farmed than wild-caught fish in 2014. This group of countries has a combined population of 3.3 billion, or 45 percent of the world's population. Countries in this group include five major producers, namely, China, India, Viet Nam, Bangladesh, and Egypt. The other 30 countries in this group have relatively well-developed aquaculture sectors, e.g. Greece, the Czech Republic and Hungary in Europe, and the Lao People's Democratic Republic and Nepal in Asia.

PER CAPITA PRODUCTION OF AQUACULTURE (EXCLUDING AQUATIC PLANTS)



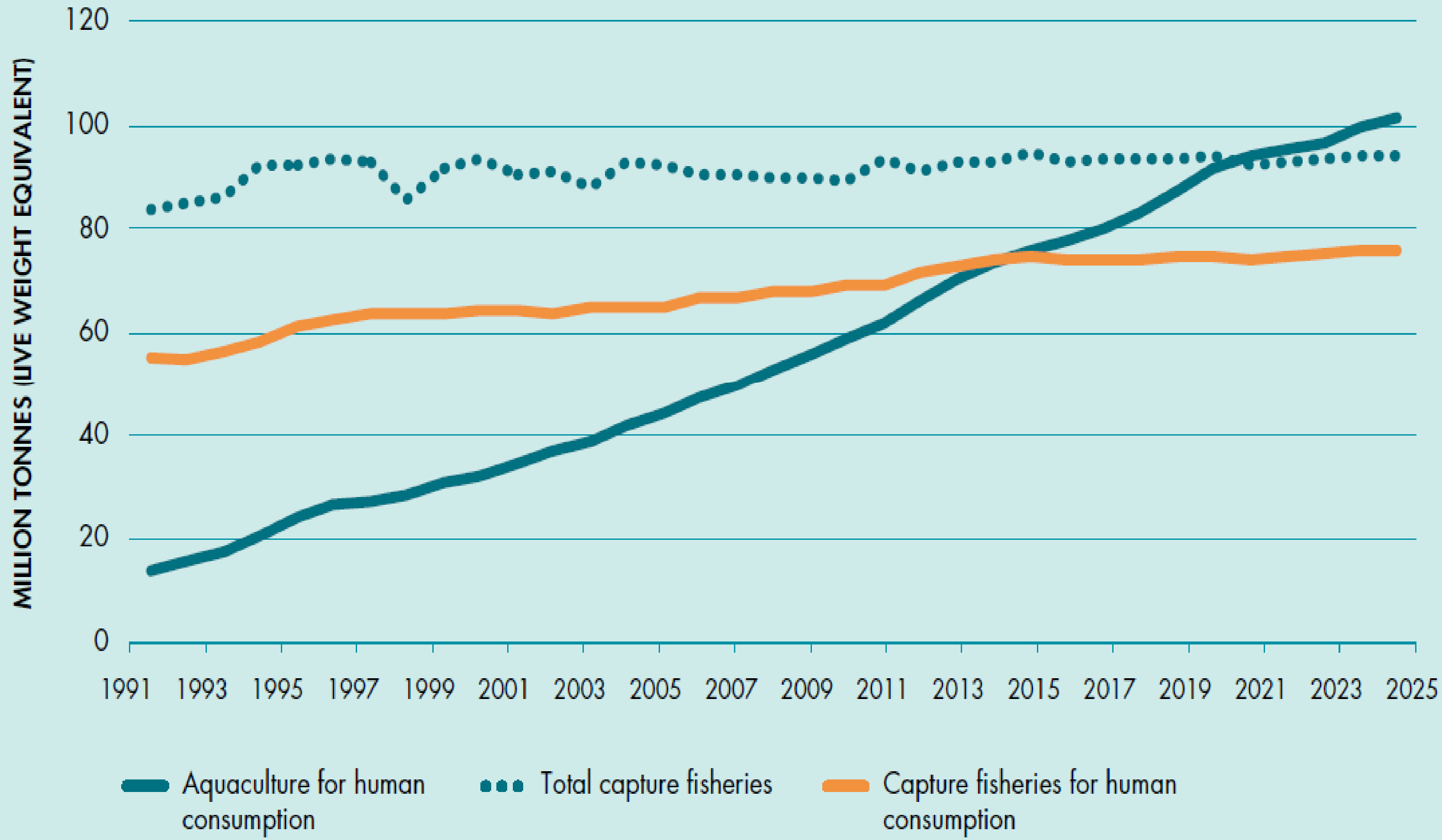
FAO PROGNOSIS

RELATIVE SHARES OF AQUACULTURE AND CAPTURE FISHERIES IN PRODUCTION AND CONSUMPTION



SOURCE: OECD and FAO.

GLOBAL CAPTURE FISHERIES AND AQUACULTURE PRODUCTION TO 2025



To allow oceans, seas and marine resources to continue to contribute to human well-being, SDG 14 recognizes the need to manage and conserve marine resources while supporting those ecosystem services that are of crucial importance for humans. A more sustainable use of resources, changes in production and consumption patterns, and improved management and regulation of human activities can help reduce negative environmental impacts and allow current and future generations to benefit from aquatic ecosystems. Promoting sustainable fishing and fish farming practices will not only contribute to resource and ecosystem management and conservation but ensure the world's oceans and seas are able to deliver nutritious food.

Along with important contributions to global food and nutrition security, livelihoods and national economic growth, oceans, seas and inland waters provide valuable ecosystem goods and services for the planet. About 50 percent of carbon in the atmosphere that becomes bound in natural systems is cycled into the oceans and inland waters. However, these same oceans and inland waters are under threat from overexploitation, pollution, declining biodiversity, expansion of invasive species, climate change and acidification. Stresses caused by human activity on the oceans' life support systems have reached unsustainable levels.

Trends in greenhouse gas emissions

	Total greenhouse gas emissions		Methane emissions				Nitrous oxide emissions				Other greenhouse gas emissions	
					From energy processes	Agricultural			From energy processes	Agricultural		
	thousand metric tons of carbon dioxide equivalent	% change	thousand metric tons of carbon dioxide equivalent	% change	% of total	% of total	thousand metric tons of carbon dioxide equivalent	% change	% of total	% of total	thousand metric tons of carbon dioxide equivalent	% change
	2012	1990-2012	2012	1990-2012	2008	2008	2012	1990-2012	2008	2008	2012	1990-2012
Korea, Dem. People's Rep.	109,895.0	-32.6	18,983	-12.2	59.1	23.3	3,306	-66.0	13.3	66.8	4,196	66.2
Korea, Rep.	668,989.7	122.6	32,625	4.2	22.6	40.6	14,979	42.2	25.7	42.2	8,968	45.5
China	12,454,710.6	220.0	1,752,290	72.3	48.0	37.6	587,166	72.5	10.5	74.7	251,254	306.1
Hong Kong SAR, China	58,633.5	57.4	3,147	105.4	25.6	0.0	476	20.1	41.3	0.0	150	-60.4
Japan	1,478,858.9	13.4	38,957	-41.8	8.2	72.5	24,911	-32.6	27.0	30.1	71,746	88.8
Russian Federation	2,803,398.5	-22.0	545,819	-12.7	79.5	8.2	65,194	-59.4	11.5	49.6	373,884	1.5

Climate variability, exposure to impact, and resilience

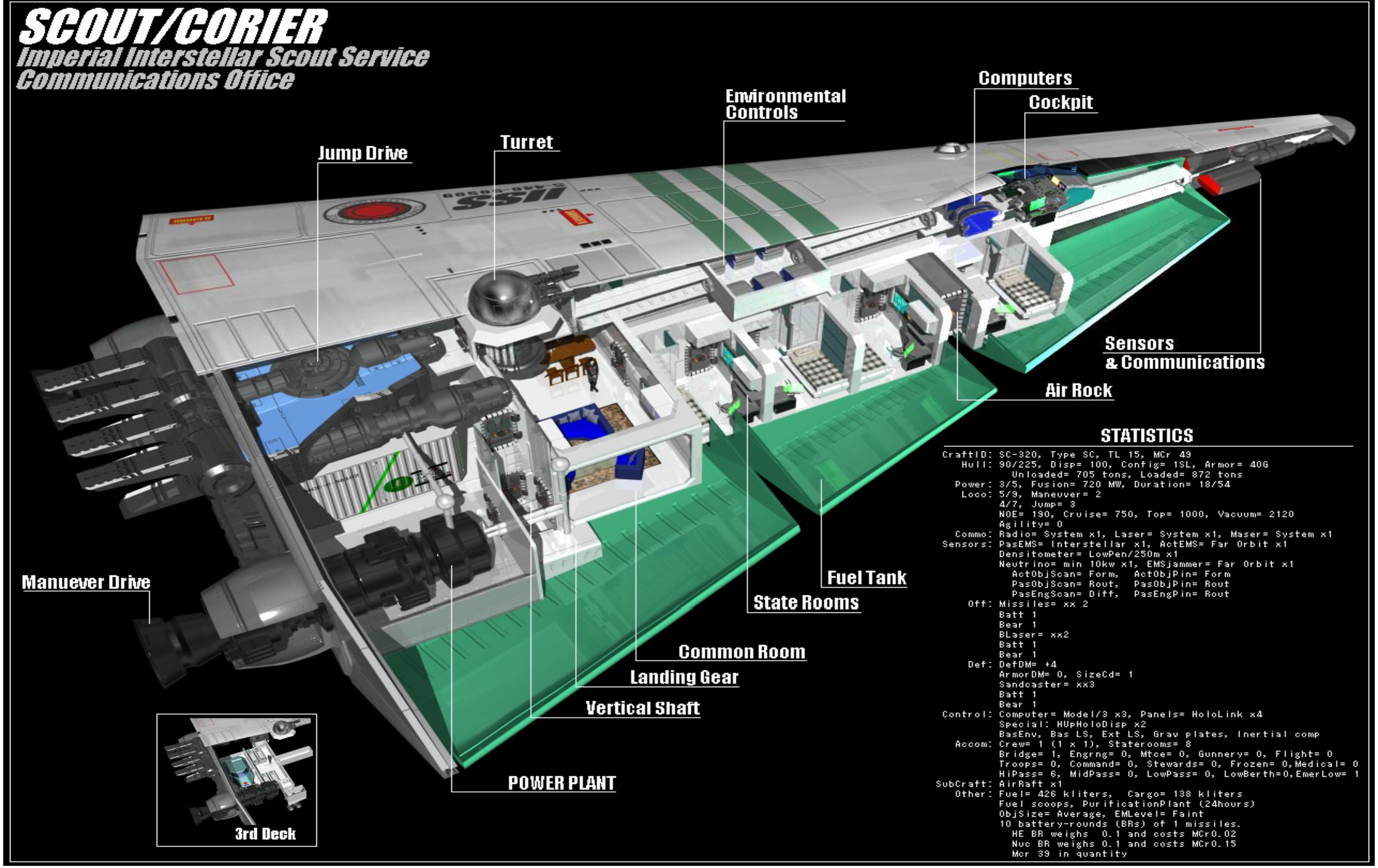
	Exposure to impact			Resilience
	Land area where elevation is below 5 meters	Population living in areas where elevation is below 5 meters	Population affected by droughts, floods, and extreme temperatures	Disaster risk reduction progress score
	% of land area	% of total population	average annual; % of total population	1, worst to 5,best
	2010	2010	2009	2011
China	1.2	6.6	8.0	..
Japan	3.4	12.6	0.0	4.5
Korea, Dem. People's Rep.	1.8	5.1	2.5	..
Korea, Rep.	2.9	3.0	0.1	..
Russian Federation	0.8	1.2	0.1	..

WHAT COULD AND MUST BE DONE TO REMEDY OUR ENVIRONMENT?

- The capabilities of our countries to reverse this trend of environment destruction are large:

COUNTRY	Researchers full-time (people per million) 2005-2015	Technicians full-time (people per million) 2005-2015	Expenditures for R&D (%GDP) 2005-2015	Patent applications filed (all) 2015
CHINA	1113	-	2.05	1 101 864
JAPAN	5386	543	3.58	318721
RUSSIAN FEDERATION	3102	501	1.19	177929
REPUBLIC OF KOREA	6899	1241	4.29	213624

A “SPACE SHIP” APPROACH




reception
Plastic Bottles Only
cans & foil
BROWN
GLASS
BOTTLES
AND JARS
ONLY
Newspapers, Magazines & Junk Mail
NO
Clear Glass
Bottles & Jars
Green Glass
Bottles & Jars
NO
Crockery / Plate Glass
Pyrex / Pots
Plastic Bags
Cardboard
Packaging
Refuse
Any Other Bits & Bobs

EARTHSHIPS HOUSES

- Eco house design is becoming an important topic across the world. There are many factors to consider such as materials, design, electricity-use, and heating and power generation, that all go a long toward eco green living.
- A good eco house design can be one of the most important factors towards combating climate change.
- The idea behind these homes is that they are **"off-the-grid,"** meaning that they try to rely as little as possible on public utilities. The man behind Earth ship, Michael Reynolds, came up with the idea back in the 1970s.
- He suggested three objectives:
- **To utilize the sustainable architecture.**
- **To rely on natural energy sources.**

- These houses are being designed by a company called *Earthship* based in New Mexico.
- A self-sustaining home is designed to maximize the light and heat gained during the winter months and as such the walls are thick, which provides thermal mass that regulates the temperature inside the house when it is both hot or cold outside.
- The outer walls of the house are made from earth rammed tires because they proved to store and radiate heat, helping with climate adjustment.

- **1. Water**

- The Earthship is built to catch and use water in the local environment as opposed to bringing water in through pipes. These sources can be from **rain, snow or condensation.** The water is filtered to remove any bacteria so that it is suitable for drinking.
- **The water collected by the above methods can be used for drinking water**.
- The toilet uses a different kind of water known as ***grey water***, which means it's already been used.
- Wastewater is sent **to a solar septic tank**, which means it's a regular septic tank but it's heated by the sun.

- **2. Food**

- The Earthship comes with **a greenhouse** that can grow food all year round regardless of the weather. You can also choose to add a fish pond and chicken coop.

- **3. Power**

- To power the house, energy is collected from the wind and the sun. The energy that is collected is stored in batteries, which are kept on the roof.
- The Earthship comes with what is known **as a Power Organizing Module** (POM), which takes the power from the battery and converts it so you can use it for AC. The house can also access city grid electricity. These Earthships do not just rely on solar heat to stay warm, tire walls are used to store heat during the day and give off heat in the night.

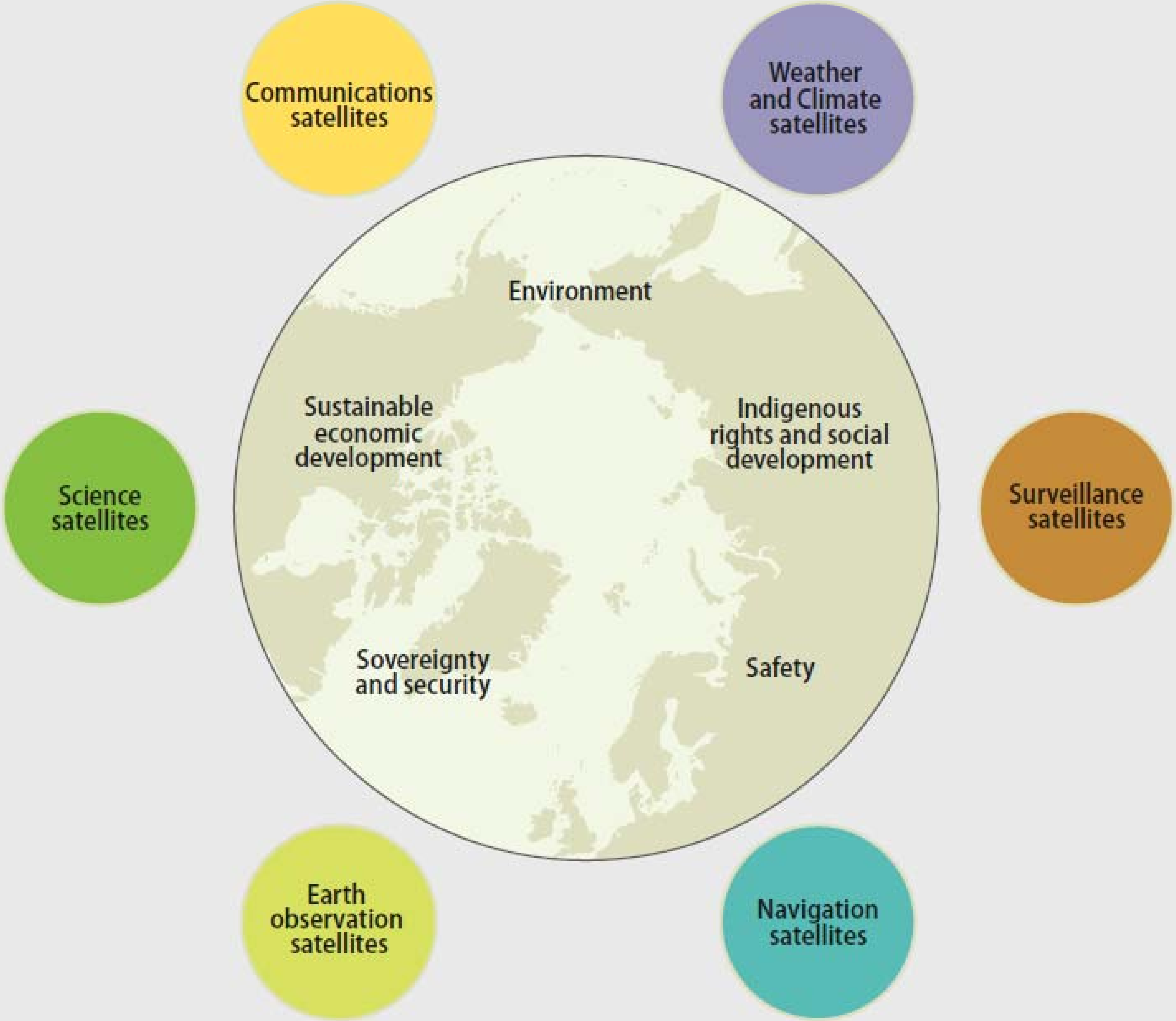
- Earthships are popping up around the world. They currently can be found in Belgium, the UK, France, Portugal, Spain, The Netherlands, Sweden, South Africa, Patagonia, Estonia, and the Czech Republic. The first district of Earthships is currently being developed in The Netherlands.

This smart Eco home is Russia is a must-see. It is designed by Russian architects and is all about integration of energy efficiency, environment, health and comfort. Minimalist interiors feature a white backdrop, high ceilings and "snapshots" of nature through its many windows and skylights, creating a sun-soaked, bright and airy atmosphere indoors.

Behind its walls, careful consideration for construction creates an eco sustainable home with thermal massing, natural lighting, solar thermal collectors, a photovoltaic solar cell system to generate electricity, and a highly effective heat pump

First Vertical Forest In Asia With 3,000 Plants Will Turn CO_2 Into 132 Pounds Of Oxygen Per Day

Space Technologies and Policy Drivers



SPACE TECHNOLOGY: MONITORING AND EARLY WARNING

- A wide variety of satellites and their ground systems are already in place.
- These range from meteorological satellites to telecommunication, navigation and earth observation satellites. They bring already some key societal contributions.
- 1) In meteorology: Significant improvements achieved in weather predictions over the past decade are due in large part to a larger international fleet of improved meteorological satellites, bringing about notably substantial gains in the management of agriculture and energy.

- 2) Space-based data:
- Over half the essential climate variables (atmospheric, oceanic, terrestrial, etc.) identified by the United Nations Framework Convention on Climate Change depend on satellite information, with many of those systems developed as short-term R&D programs for scientific research.

- Climatologists and glaciologists rely more than ever on continuous satellite observations of the Arctic and Antarctic to study, in almost real-time, climate change processes.

- A number of scientific discoveries concerning climate change have been made thanks to spacebased data.
- For example, the Topex-Poseidon and Envisat missions have shown through space altimetry that oceans have been rising over the past decade; collected data have also provided unexpected information for monitoring oceanic phenomena, such as variations in ocean circulation on the level of the El Niño 1997-98 event.

- 3) **Watching the global water cycle**:
- satellites contribute to the understanding of the global water cycle and to improved fresh water management.
- Clouds, water vapours, precipitation and sea-levels are all measured from space, in coordination with in-situ systems.

- Satellite data are used to monitor daily the quality of water bodies, detecting in particular natural and man-made pollutants (e.g. harmful algal blooms, oil spills).

- Satellites represent often the only instrument available in places, where ground systems are not deployable; particularly in the cases of telecommunications and climate monitoring systems (e.g. data from buoys and communications with ships at sea).

The infrastructure approach

- It is possible to consider space tools as parts of a larger infrastructure and compare the relative levels of investment with those required for terrestrial infrastructures (roads, power, rail, etc.).

- The earth observation and meteorological satellite infrastructure plays a key role in climate monitoring and can serve as an illustration.

- The report, the overall cost of setting up such a system – including both R&D and operational satellites – is not unduly high, nor are the rates of annual investment to maintain and expand the space infrastructure and its related networks, compared with other large infrastructure.

The risk management approach:

- Another novel angle could be to assess the operational usefulness of data by taking a risk management approach to space-based infrastructure.
- Interesting parallels can be drawn with the significant role of economic information or weather risk insurance packages. Weather is a major determinant of earnings performance for entire economic sectors (e.g. utilities).
- The US Department of Transportation estimates that weather-related delays in air transport cost passengers USD 10 billion in lost time and productivity each year in the United States alone. On an even larger scale, **systematic climate monitoring may become an essential tool for governments to hedge the risks associated with climate change and unsustainable resources management** (in fisheries for example).

PRIORITIES FOR COOPERATION BETWEEN SCIENTISTS

- 1) evaluation of damage to environment in the region:
- 2) assessment of scientific and technological potential of the participating countries in the area environment protection;
- 3) setting up joint interdisciplinary research teams to identify and meet emerging challenges in the area of environment;
- 4) designing policies and programs to combat degradation of environment;
- 5) disseminate knowledge and research results among population