"Science must play a crucial part in ensuring a sustainable world"

At the end of September, heads of state will meet at the United Nations (UN) in New York for the first review of the SUSTAINABLE **DEVELOPMENT GOALS (SDGs)**, which were put in place in 2015 for 2030. Jean-Paul Moatti, President and CEO of the French National Research Institute for Sustainable Development (IRD) and a UN Rapporteur, says the priorities are to strengthen sustainability science and to ensure public and private financial flows are more aligned with sustainable development.

2 ZERO HUNGER NO POVERTY 3 GOOD HEALTH AND WELL-BEING 5 GENDER EQUALITY QUALITY 6 CLEAN WATER AND SANITATION AFFORDABLE AN CLEAN ENERGY 8 DECENT WORK AND ECONOMIC GROWTH C 10 REDUCED 1 SUSTAINABLE CITIES AND PRODUCTI Jean-Paul Moatti is President and CEO of the French National Research Institute for Sustainable Development and Chair of the French Alliance for environmental sciences (Allenvi). He is one of the 15 14 LIFE BELOW WATER 5 LIFE ON LAND 6 PEACE, JUSTICE AND STRONG INSTITUTIONS independent experts named by the UN to draft the first quadrennial assessment report (2015-2019) on the UN's Sustainable Development Goals

The UN set its SDGs in 2015. Where do we stand today?

Unfortunately, most of the 169 targets for the 17 SDGs are not on track for 2030. For some major goals, like the reduction of inequalities, biodiversity loss, mitigation of climate change and limiting waste from human activities, we are actually moving in the wrong direction.

You call for great vigilance for when it comes to reducing poverty. Why?

More than half the world's extreme poverty—when people live on less than \$1.90 a day—is concentrated in five countries in sub-Saharan Africa

and South Asia. Between 2000 and 2017, one billion people managed to escape from extreme poverty. While this is good news, the number of people subsisting on between two and three dollars a day has increased by the same number over the same period. These populations remain vulnerable to economic or ecological crises and conflict.

Another concern is increased inequality. In 1980, the world's richest 1% held between 25% and 30% of global wealth, compared to 40% in 2016. The poorest 75% continue to make up around only 10% of the total. There is also the misconception that increased economic growth will eventually eradicate poverty, thanks to the "trickledown" effect. Indeed, since

"ALL PUBLIC AND PRIVATE FINANCIAL FLOWS **SHOULD BE** PROGRESSIVELY **ALIGNED WITH THE SDGs**"

the 1980s, the richest 1% have acquired 27% of income from growth, while the poorest 50% have only gained 12%. One big obstacle to fighting poverty

and inequality and promoting sustainable development is that the richest populations want to uphold current economic models.

What about the other targeted goals?

Sending girls to school, where progress is effective, will no longer be a subject for discussion if some areas become totally uninhabitable because of global warming! We need to act urgently, which implies a massive reorientation of public and private sector investments towards sustainable development, as well as support from civil society.

What is the role of science today in achieving these objectives?

Science is critical for guiding the implementation of sustainable development. One recent example is the complex issue of reducing pesticide use, where research at a fundamental level will be required to develop better agricultural practices. We now have sufficient scientific and technological knowledge to potentially achieve many of the set targets in 2030, but we must give ourselves the means to do so. We will require \$2.5 trillion per year to help developing countries on the road to sustainable development. This

is just over 10% of the world's annual economic and financial investment, which is around \$23 trillion, and less than half of the impact of fossil fuel subsidies worldwide. The challenge lies in therefore directing sufficient public and private resources towards sustainable development and distracting them from business as usual.

Could you give us a concrete example?

Overfishing and overexploitation of marine ecosystems. If properly managed, marine protected areas (the equivalent of national parks at sea) are



one way to ensure the health of marine ecosystems while continuing to provide fish and seafood for consumption. But affected communities need to be involved from the outset to ensure they continue earning a living and support change.

Is this what sustainability science is all about?

Yes. Sustainability science gained momentum at the turn of this century with the realization that global resources are finite. Its goal is to understand the entire causal chains of the ecological and social phenomena it addresses. so it must integrate key effects

at all scales - from local to global. It is therefore inherently interdisciplinary. It also encourages scientists to work with the communities involved and to develop solutions for and with all actors in the field. The National Academy of Sciences, in the United States, made sustainability science a priority in 1999 and the Chinese Academy of Sciences followed suit in 2009. Scientific research devoted to this field has continued to grow exponentially since.

Many of the goals seem to be at odds with each other. How can sustainability science help resolve these contradictions?

While this is true, the objectives are all potentially synergistic, too. If we work solely objectiveby-objective, we risk improving one at the expense of the other. A recently published study in Nature Sustainability, for example, showed that if we are not careful, poorly designed CO₂ mitigation policies could increase the number of people suffering from hunger through land use effects. But there are effective solutions to mitigate both climate change and access to proper food and nutrition. It is at international, national, but also at local levels, that these contradictions can be resolvedhence the need for collaboration with scientists from developing countries. At the IRD, more than 60% of our publications are co-authored by partners from developing countries.

