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WIPO Magazine

IP and the SDGs

In this issue

WIPO

Note from the Editor

Did you know 31.4% of patents now relate to the SDGs?

If you are a regular reader of our magazine and have followed our move from quarterly print issues to regular a flow of web articles, this edition may surprise you. It's a special edition celebrating World IP Day, focusing on intellectual property (IP) and the UN Sustainable Development Goals (SDGs) this year.

Therefore, we have selected profiles (IP at Work) that spotlight the global challenges we are facing and the kind of innovation that may help alleviate some of the problems or inspire us to seek creative solutions.

We are also pleased to include exclusive essays on IP and its close relation to the SDGs. Take Edward Kwakwa, who stresses the importance of partnerships contributing to these goals as expressed in SDG 17, which is nevertheless often overlooked.

However, the connection is already solid and growing stronger in other areas, such as industry and innovation. Did you know that nearly a third of patents now relate to our shared goals? WIPO patent analyst Christopher Harrison reveals the emerging trends.

Access to knowledge, a topic close to our heart and expressed in SDG 4 as the quality of education, is another focus. Based on their world-first analysis, the authors examine the Health InterNetwork Access to Research Initiative (Hinari) program set up by the World Health Organization (WHO). They investigate whether access to scientific journals truly translates into local clinical trials and global patent filings. A similar angle was taken in a passionate new piece on the gender gap in patenting.

Speaking of gaps, we uncovered some in our own coverage while compiling this issue. In a way, they mirror those SDGs that seem particularly hard to achieve, such as those aimed at ending poverty and hunger. In the non-human realm, life on land and life below water are other topics that are only now gaining traction, so we look forward to building on these subjects in the future and have included shorter pieces here.

Some of the content you will find here exists in a longer form online, and we encourage you to explore the corresponding links to delve deeper, and the online edition of WIPO Magazine.

Lastly, this edition marks farewell to our retired editor, Catherine Jewell, whose dedicated contributions and tireless work are behind some of these pages.

Going forward, we hope this special edition will continue to inspire and inform as we reshape our online presence, so look out for more changes to come.

In the meantime, please do not hesitate to share this edition and reach out with your comments, pitches for articles and questions you'd like to see answered in future.

Best wishes,

Nora Manthey
Editor, WIPO Magazine
Email wipomagazine@wipo.int

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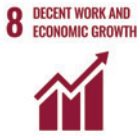
Photo: Courtesy of Iván González and Armando Vite

Germán Santillán, founder of Oaxacanita Chocolate.

Reviving Indigenous Mixtec Cocoa Traditions



The social enterprise Oaxacanita Chocolate embraces Mexico's rich cocoa culture and is working with Indigenous communities to revive these traditions while spurring the social, economic and environmental development in the state of Oaxaca.

Founder German Santillán is building a business that embraces the principles of fair trade and environmental sustainability in collaboration with local communities. "I teamed up with local Indigenous families in Oaxaca, and we began operations in an empty room in my grandmother's house. We started cultivating 20 cacao trees and now we have 5,000 under cultivation in five towns across the region," he says.

Today, Oaxacanita Chocolate is the first proudly Indigenous chocolate company in Mexico to form international alliances with organizations such as the Inter-American Foundation and the US Government.

Intellectual property has played a significant role in brand development. "The first thing we did in Oaxacanita Chocolate – Oaxacanita means, 'the little girl of Oaxaca' in Zapotec-Spanish – was to register the name of our brand. Then we opened our Facebook page where most of our marketing operations take place. That's where we make 80% of our total sales," Santillán explains.

Looking to the future, Oaxacanita Chocolate plans to promote its brand and increase its value in multiple markets beyond Mexico. By 2022, the company had sold over 2,000 kilos of chocolate and was expanding its online presence to Canada and the United States.

Photos: Courtesy of Oaxacanita Chocolate

In rural areas of Mexico's Mixtec region, the educational program La Escuelita del Cacao teaches children from Indigenous communities the importance of adopting sustainable agricultural practices. (Photo: Courtesy of Oaxacanita Chocolate)

IP at Work

Alleviating Food Hunger and Reducing Food Waste with Innovation

Kavita Shukla, founder and CEO of The Freshglow Co., is on a mission to alleviate hunger around the world with her invention FreshPaper, sheets infused with botanicals that keep produce fresh for longer.

"Food waste is this massive and very overwhelming challenge, but it's actually something that every single one of us can start to address in our own homes," Shukla says, noting how shocked she was when she first learned how much of the world's food supply spoils on a daily basis. "The world's farmers actually grow enough food to feed everyone on the planet, but over 800 million people still go hungry every single day."

While the food waste challenge is daunting, she also sees it as an opportunity to prove how small innovations can make a big difference. Her journey started early and is a story of simple beginnings and empowerment. When visiting her grandmother in India as a 12-year-old, Shukla drank water believed to be contaminated, but thanks to her grandmother's homemade remedy, she didn't get sick. She was intrigued and began studying her grandmother's remedy, and was able to figure out why it worked and how to replicate and advance its effects. She now uses this knowledge to prevent food spoilage and relieve hunger around the world.

Shukla holds four US patents and an Index Design to Improve Life award, a leading international prize for design. Her product is used by farmers and families across the globe, and Freshglow has also partnered with retailers such as Whole Foods and Walmart.

Read more about IP at Work and find the full profiles of featured businesses online.

Photo: Courtesy of USPTO

Kavita Shukla, founder and CEO of The Freshglow Co.

H3D: Africa's First Integrated Drug Discovery and Development Platform

"Drug discovery in Africa has huge potential to contribute to humanity and to create local jobs," says Kelly Chibale, Director of H3D (above, right).

Kelly Chibale, a Professor of Organic Chemistry at the University of Cape Town (UCT), holds the Neville Isdell Chair in African-centric Drug Discovery & Development and is also Director of H3D, Africa's first integrated drug discovery and development center. H3D was founded at UCT in April 2010 and focuses on translational medicine, which involves early-stage medicine discovery in the lab through to the treatment of patients in clinical settings. WIPO Magazine recently sat down with Chibale to learn more about H3D, and the role intellectual property plays in its groundbreaking work.

WM: What is the potential of drug discovery in Africa?

KC: Africa is arguably the most genetically diverse continent. Everybody came from Africa and went somewhere else. That means diseases are not African problems or African diseases, they are human diseases, human problems. So, drug discovery in Africa has huge potential to contribute to humanity and to create local jobs.

And how is H3D affecting health innovation in Africa?

H3D is having an impact at various levels, particularly by creating drug discovery infrastructure and platforms capable of contributing to the global pipeline of innovative products that could be further developed.

Photo: hadymyah/E+

Malaria was an anchor program that enabled us to acquire the skills and experience we wanted to develop, and which we then transferred to other diseases.

In other words, we have strengthened our capacity to translate basic science knowledge into potential life-saving medicines. And we are bridging the gap between the lab and the patient.

You focused initially on malaria. Why?

Malaria was an opportunity for us to build the infrastructure required for translational medicine. At the end of the day, beyond understanding the biology of the human malaria parasite, the drug discovery principles are the same for malaria or cancer. For example, regardless of the disease, among other things, the common goal is to understand how the human body will handle the drug candidate.

In terms of drug discovery, H3D is currently focusing on action studies to identify biological targets and better understand the mechanism of resistance of these targeted organisms to drugs.

The malaria project was an opportunity to work with the Medicines for Malaria Venture (MMV) and to subsequently engage with new partners, such as Merck and the Bill and Melinda Gates Foundation. Once we developed the infrastructure we needed for that project, we began adding other diseases, including tuberculosis (TB), and antimicrobial resistance. In 2022, we had an opportunity to work with Johnson & Johnson as one of the company's three satellite centers for global health discovery. In sum, malaria was an anchor program that enabled us to acquire the skills and experience we wanted to develop, and which we then transferred to other diseases.

How important are such partnerships to H3D's work, and to developing a robust health innovation ecosystem in Africa?

Partnerships are extremely important, even for innovative pharmaceutical companies with financial muscle. Indeed, some of the product portfolios they offer include drug candidates licensed in from third parties. This enables them to de-risk the early stages of drug development.

For H3D, partnerships were important from the start, for three reasons. First, to tackle infrastructure challenges; second, to build the technology platforms we needed; and third, to access skilled people.

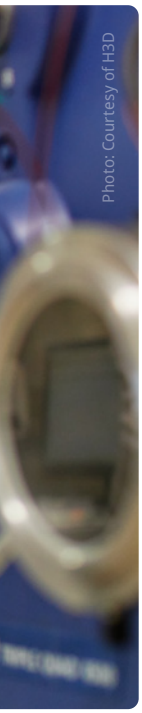


Photo: Courtesy of H3D

Partnerships are also important to secure funding. When you have a project with global support, you attract partners who share the same goals, funding grows, and you gain access to a network of centers of excellence. Partnerships can bring to the table what you don't have, because everyone is interested in the project's success. When there is mutual interest, you can make a huge difference.

What about the importance of building a local procurement support system?

One of the main barriers to scientific innovation in Africa has been a lack of infrastructure in the broad sense. This includes a local procurement support system with functioning laboratories, access to the spare parts you need when something breaks down, the ability to access reagents and chemicals readily and rapidly, and so on.

Of course, from a business perspective, we need scale that justifies the business. At present, there are too few players, so business opportunities are limited. That's why we're working to expand the community to create the demand that will foster the businesses we need to supply the chemicals and reagents required for research and development, for example.

What is the role of intellectual property in all this?

When there's an unmet medical need, you have to innovate, and IP incentivizes innovation. IP is an enabler and underpins robust innovation ecosystems.

Cash-strapped universities can use IP to generate new sources of income from their research, through university spinouts, for example. IP is also a magnet for investment. People want to invest in a country where there is respect for rules and laws, including IP.

Do you still need IP in Africa for infectious diseases, where commercial returns are low?

Absolutely. Because IP is also a responsibility, even for infectious diseases where commercial returns are perceived to be low. Without IP you would have a free-for-all. When it comes to health equity, it's important to remember that the person who owns the IP can decide whether to share it voluntarily or not.

When you hold IP rights in a medicine, you can control its use to some extent. That's why, in Africa, we need to be owning IP. When we do, and we find an appropriate partner to take the IP forward, we get a return. I would rather own 1% of one billion than 99.99% of zero.

IP is also a responsibility, even for infectious diseases where commercial returns are perceived to be low.

What is the current focus of H3D's work?

In terms of drug discovery, we're focusing on action studies to identify biological targets and to better understand the mechanism of resistance of these targeted organisms to drugs. These organisms are very clever. Our job is to outsmart them.

Do you still see the need for new approaches?

Yes. At a scientific level, I'm an advocate for Afro-centric drug discovery. You need to find a target to hit – an enzyme or a protein – which may respond differently in different populations for genetic reasons.

> Drug development needs to move from a one-size-fits-all focus towards a population-centric approach.

Genetic differences in the expression and activity of drug-metabolizing enzymes can lead to variable responses to therapeutics. For example, in people of African descent, due to genetic mutations, enzymes responsible for metabolizing the antiretroviral drug Efavirenz work more slowly than in other populations and this can result in toxicity, even death, due to drug overdose if dosages aren't adjusted appropriately. So, drug development needs to move from a one-size-fits-all focus toward a population-centric approach.

We really need to invest in understanding the genetics of the African population with respect to biological drug targets we go after and the enzymes responsible for metabolizing specific drugs.

Also, we need to address the funding gap in translational medicine, which many investors find too risky. This will require policy changes to encourage investors to see drug development as a continuum that requires investment at each stage of the value chain. This would create opportunities to share both risks and benefits, and ultimately will benefit everyone.

Read the full interview online and learn more about Chibale's recommendations for developing a robust health innovation system in Africa.

Can Access to Published Research Help Local Science and Innovation?

By *Alexander Cuntz*, Head of Creative Economy Sector, WIPO, and *Alessio Muscarnera*, Research Fellow, Department for Economics and Data Analytics, WIPO

Photo: Getty Images/Erdark

Low-cost access to information can drive research and clinical trials in developing economies and contribute to SDGs. But different regions are affected in different ways. So how can low-performing institutions catch up?

So far, the public debate on access to medicine, neglected diseases, and patent-protected technology has underplayed the potential of access to information for economic development. Similarly, earlier research has revealed a startling gap between lower- and higher-income countries in terms of access to knowledge, with over half of medical institutions having had no subscriptions to academic literature in lower-income countries.

Several UN agencies and major academic publishers launched the Research For Life (R4L) initiative to fill this gap. The World Health Organization (WHO) runs Health InterNetwork Access to Research Initiative (Hinari), one of five programs under the R4L umbrella. It provides free or low-cost access to academic literature to at least 270,000 researchers in over 100 developing economies. This is for this WHO-led program alone. The entire initiative includes more than 21,000 peer-reviewed journals, 69,000 e-books and 115 data and other sources.

Focusing on Hinari, a new WIPO research paper carried out empirical analysis of millions of data points to understand the strengths and weaknesses of the program. It is the first study to link access to scientific publications in developing countries to welfare along the science-to-innovation pipeline.

The report shows a local increase in health science publications of up to 75% after joining Hinari. Likewise, involvement in international clinical trials grew by over 20%, suggesting that research and innovation in local institutions improved. Screening over 36 million scientific papers in PubMed, a repository of health science, the study found more than 167,000 papers co-authored by local researchers in developing economies, which cited clinical trials conducted worldwide over 30 years.

> An uptick in research and clinical trials only sometimes leads to global patents.

However, this uptick in science publishing and clinical trials only partially translated into global patents and inventions. The study attributes this to developing countries often lacking infrastructure and funding to transfer new findings into patented technologies. This gap reveals the remaining challenges in developing innovation and IP systems.

Moreover, the study also finds that local context matters. Institutions in specific regions and those that already had a high research performance benefited most from the Hinari program. This also means that it is harder for others to catch up, despite better access to information.

Access to global knowledge counts on the ground

Empowering local researchers by providing access to information is essential to their work. Researchers tend to target diseases that affect the local population and may be overlooked by researchers abroad. Enabling such access may help innovation in neglected diseases, mainly by connecting local teams to the global knowledge base.

Aside from increased scientific activity, R4L also reports direct effects from Hinari regarding medical practice and patient care. The initiative quotes

Photo: Getty Images/zeljkosantrac

Dr. Nguyen Duc Chinh from Viet Duc Hospital, Hanoi, Viet Nam: "Good research, in short, leads to better patient care." The doctor relied heavily on Hinari for his PhD on intestinal TB and surgical treatment. TB is prevalent in Viet Nam, but there is a relative lack of information on intestinal TB. "With the information and knowledge we obtain," he says, "we feel more confident in practicing and implementing respected medical expertise from around the world."

> Empowering local researchers by providing access to information is essential to their work.

Dr. Sami Hyacinthe Kambire at Kamboinsé Research Station, Ouagadougou, Burkina Faso, also found his research progressing faster and wrote grant-winning funding proposals thanks to Hinari. Before his institution adopted R4L, Dr. Kambire often devoted considerable time to research already

performed elsewhere. The initiative helped reduce these duplicative research efforts in global health sciences and increase the quality of local teaching and education.

Access to information affects institutions differently

Despite the impacts, the study also found that the program effects differed for different parts of the world. Research institutions in the Carribean, Central Asia, Europe and Latin America benefited the most in generating new scientific knowledge. On average, their academic paper output increased by 80–100%.

Regarding clinical trials, program participation is most impactful for East Asia, the Pacific, the Middle East and North Africa. Trial activity rose by up to 35% at institutions in these regions. That does not mean other regions did not gain from the program, but the impact has been less pronounced.

> Hinari preserves the gap between the most and least productive institutions for scientific publications and clinical trials.

However, there are also institutional differences. Notably, the study authors wanted to avoid comparing apples to oranges, because high- and low-performing research institutions differ. The high performers might be more likely to adopt the Hinari program in the first place. Seeing more publications might also be an outcome of the institutions' selection into the program rather than an outcome of the program and better access to knowledge on the ground. To reveal the causal effects rather than mere correlations, the study compares different fields. This means health sciences supported by the program are matched against other research fields not supported by Hinari but conducted at the same institution.

How to make the most of access to information

Having ruled out the factors described above, the report suggests that program management could improve in two ways. First, it shows that already productive institutions benefit more from Hinari. For example, research institutions that have previously published academic papers see an average 60–70% increase in their publications after joining. This increase is only around 40% for institutions that rarely published scientific works previously. This suggests that Hinari preserves the gap between the most and least productive institutions for scientific publications and clinical trials. Under these conditions, the least productive institutions are, all else being equal, less likely to catch up.

Still, the study ultimately supports the view that the Hinari program and the R4L initiative contribute to achieving the SDGs. They help boost research and innovation capacity in developing economies and improve health services (SDG 3) and education quality (SDG 4) at local institutions. They also aim to build industry, innovation and infrastructure, thus encouraging decent economic growth (SDGs 8 and 9).

The Hinari program and the R4L initiative contribute to the SDGs.

The R4L initiative is also an excellent example of how private–public initiatives can make a difference. It joins private sector stakeholders from the global publishing industry and research institutions in the UN member states in a win–win situation. For research institutions, the initiative provides a practical solution. Their libraries and labs often need to be better resourced, and R4L improves access to information for students and researchers. It is also a smart way for industry stakeholders to show their corporate social responsibility and enhance their social impact in developing economies. It could also help grow local demand and the customer base in the long term.

Moreover, easing access to published research through initiatives like Hinari and WIPO's Access to Research for Development and Innovation (ARDI) program can significantly affect research output and contribute to desired social and economic outcomes laid out in the SDGs. UN agencies like the WHO and WIPO have been vital matchmakers. However, addressing existing gaps through schemes such as WIPO's Technology and Innovation Support Centers (TISCs) may help build local infrastructure and contribute to a vibrant IP and innovation system. In conclusion, the report's findings on success and remaining challenges may inform stakeholders' decisions to renew or change their commitment to R4L beyond 2025.

Photo: Getty Images/Edwin Tan

Photo: Getty Images/skynesher

Closing the Gender Gap in Patents Across Latin America

By *Maria Fernanda Hurtado*, Executive Director, Global Intellectual Property Alliance (GLIPA) and *Esteban Santamaría Hernandez*, Director, CAIINNO, Mexico and GLIPA Board Member

Just over a year ago, we formed the Global Intellectual Property Alliance to build a world in which intellectual property enables all people to improve their lives and create a more prosperous and sustainable future. GLIPA is now working in Africa, Asia, Europe, Latin America and North America. Our mission is to attract more and diverse groups of users to the intellectual property system. In line with these objectives, in 2023, the GLIPA Latin America (LATAM) chapter and the Mexican think tank, CAIINNO began working to get a clearer view of the participation levels of women in the IP system, specifically in the field of patenting in Brazil, Chile, Colombia and Mexico.

The gender gap in IP is a global problem

The gender gap the IP system is not confined to any single country or region; it is a global phenomenon. A recent study by WIPO, which offers an international comparison of the gender gap in global patenting between 1999 and 2020, finds that women participated in just 23% of all patent applications, representing 13% of the inventors listed, in that period. According to the study, if current trends continue, gender parity in patenting in Latin America will only be achieved in 2068, seven years later than the current global gender parity forecast of 2061.

In Brazil, Chile, Colombia and Mexico, GLIPA and CAIINNO's work offers greater clarity on the role that women play in the invention process in those countries. The data also considers regional and communal levels.

Year	% of patents filed by male inventors only	% of patents filed by female inventors only	% of patents filed by mixed teams of at least one woman and one man
Brazil			
2017	82.0%	7.2%	10.8%
2022	72.4%	5.8%	21.8%
Chile			
2017	79.5%	8.3%	12.1%
2022	67.3%	7.4%	25.3%
Colombia			
2017	63.6%	10.5%	25.9%
2021	62.9%	6.6%	30.5%
Mexico			
2017	56.6%	5.3%	38.1%
2022	44.9%	5.4%	49.7%

Table 1: Percentages of patents granted by inventors, including men, women and mixed teams in Brazil, Chile, Colombia and Mexico.

From 2017 to 2022 the use of the patent system by both men and the already small number of women inventors obtaining patents fell in Brazil, Chile, Colombia and Mexico. Interestingly, the rate of patenting by mixed teams shows a significant increase in women's participation. While this trend is promising, there is still a sizeable gender gap in the patent system. This is a gap that we need to narrow.

> If current trends continue, gender parity in patenting in Latin America will only be achieved in 2068, seven years later than the current global gender parity forecast of 2061.

Photo: Courtesy of GLIPA

Through its IP education and awareness programs, like this training event at the University of San Andrés in Buenos Aires, Argentina, GLIPA is drawing new users to the IP system and equipping them with the knowledge and skills they need to use IP rights effectively.

The GLIPA/CAIINNO study highlights four key actions to help Latin American countries reduce the gender gap in patenting:

1. Closer collaboration with organizations like WIPO to support efforts to overcome blocks and standardize the collection of IP data, especially with respect to gender, from IP offices around the world.

2. Better and easier access to these data will help to show a clear picture of how the IP system is being used around the world and by whom. It will also help ensure the development and implementation of effective policies and strategies to encourage greater participation in the IP system by more diverse groups, including women.

3. Reaching out to women inventors and actively encouraging them to engage with the IP system is crucial. This requires close collaboration among all those who influence the IP landscape, including government, business associations, civil societies such as CAIINNO and GLIPA, local innovators and others.

4. We also need to rethink IP education. This involves moving beyond seeing IP exclusively as a technical legal field, and broadening our approach to ensure IP is seen as a practical toolkit for inventors, creators and entrepreneurs to translate their ideas into thriving businesses.

Dr. Beraich, CEO of Biodôme du Maroc, has developed a sustainable and cost-effective production method to recover and treat agricultural waste for Moroccan farmers.

IP at Work

Bringing Renewable Energy to Local Farmers

Eco-innovative farming solutions are vital to ensuring the global reduction of greenhouse gas (GHG) emissions related to agriculture. Biodôme du Maroc, a small, fast-growing Moroccan company, provides local farmers with a technology that gives them access to renewable energy for on-farm use.

Founded in 2013 by Dr. Fatima Zahra Beraich, Biodôme du Maroc is the first Moroccan company to specialize in the recovery of organic waste through natural treatment and environmentally friendly processes. This is to enable farmers in rural areas to produce biogas and fertilizer.

For the environment, biogas helps to reduce greenhouse gas emissions from abandoned organic waste and minimizes the risk of polluting waterways. This “clean” method of energy production also reduces reliance on wood as a fuel source.

Biodôme du Maroc offers a range of small-scale agricultural anaerobic digesters. These digesters use a simple and innovative system to produce biogas and recover organic matter. Inside underground concrete enclosures, farmers can deposit different kinds of organic waste, such as household, plant and animal waste, which is fermented in a biological accelerator. In this process, gas is produced through methanization or anaerobic bio-digestion, where bacteria naturally break down organic matter within weeks.

Photos: Courtesy of Biodôme du Maroc

By providing a technology that produces gas from organic waste, Biodôme du Maroc gives local farmers access to renewable energy for agricultural production.

Dr. Beraich currently holds six patents covering innovations that improve the efficiency and performance of Biodôme's bio-digesters.

"The process of securing a patent means that our technology is evaluated by experts and allows us to understand just how different our inventions are from other competing technologies. This allows us to protect the inventive characteristics of our outputs," explains Dr. Beraich. "With these patents in hand, we hope to be able to license our more recent patented innovations."

The support of the Moroccan Association for Research and Development (R&D Maroc) – part of the network of Technology and Innovation Support Centers (TISCs) in Morocco – has played a critical role in the success of Biodôme du Maroc. "I learned about the TISC network at an outreach event at the University organized by the Moroccan Industrial and Commercial Property Office," Dr. Beraich explains. R&D Maroc helped Dr. Beraich secure seed funding and also ensured she had the help she needed to draft her patent applications, and license and access the technology she required to create and commercialize her bio-digesters. Biodôme is currently marketing its patent-protected bio-digesters in Morocco and across Africa.

Read more about IP at Work and find the full profile of Biodôme du Maroc online.

Nigerian Author Sparks Creativity Among Young Creators

Photo: Courtesy of Philip Kisaka Wasilwa

Lawyer and writer Chidera Okolie is on a mission to inspire young Nigerians to make the most of their creative talents.

From immersing herself in the world of literature to crafting her own stories, Chidera Okolie has been nurturing her creative interests since she was a child. The Nigerian lawyer and writer is the author of two novels, *When Silence Becomes Too Loud* (2014) and *Not Forgiven* (2017). Beyond her passion for writing, Okolie is actively encouraging young writers in Nigeria to fulfil their writing dreams through her Idios Creatives initiative, which she launched in 2018. This is her story.

Chidera Okolie set up Idios Creatives, a platform for young people to explore and express their creativity. “Through the Idios Creatives project, I wanted to provide a platform for a new generation of writers to embrace their creative power. It is my way of contributing to the development of young people’s writing and other creative skills,” Okolie explains.

To capture the attention of young people across Nigeria, in 2018, Okolie created the Idios Prize for Flash Fiction and Poetry. Over 300 schoolchildren took part in the competition. “We visited schools across Nigeria, collecting short stories from young writers. Eventually, we had about 300 stories, which we narrowed down to the best 100 for publication. This has helped showcase the abundance of creative talent in Nigeria,” Okolie notes. In setting up Idios Creatives, her strongest hope is that “young people are encouraged to read more and to explore their own creativity.”

Advancing IP and creativity in Nigeria

The author is also a champion of intellectual property rights, highlighting their crucial importance in recognizing, rewarding and supporting creators for their work.

“IP allows you to protect your creative work from exploitation, illegal reproduction and misuse. It also ensures the preservation of your economic rights, in other words, your ability to earn income from your work, and your moral rights, including the right to be credited as the creator, and the right to protect the integrity of your work,” Okolie explains.

While Nigeria has made progress in this regard, Okolie believes there is still more to be done to enhance the country’s copyright landscape. “Nigeria has long suffered from piracy, but the landscape is gradually improving. I strongly believe that IP rights play a critical role in emboldening artists to safeguard their work and use it for economic benefits. This becomes particularly significant when building a career based on one’s creativity,” she says.

Okolie started writing her first novel, *When Silence Becomes Too Loud*, in 2014, without any intention of sharing it outside her personal sphere. “It was purely a personal endeavor,” she notes. But her father insisted that she have her book published. “I was hesitant to reveal myself so intimately and to allow others to delve into my innermost creative thoughts," she says.

Despite her initial fears, Okolie started looking for a publisher and the book’s release, in 2014, exceeded all her expectations. “The book was widely acclaimed in my country and gained a lot of attention. It caught the eye of my country’s former president, who expressed his pride in associating with young people who strive to keep creativity alive in the country,” Okolie explains.

Photo: Courtesy of Chidera Okolie

"My hope is that young people are encouraged to read more and explore their creativity," says Chidera Okolie, founder of Idios Creatives, a platform that supports young creatives in Nigeria.

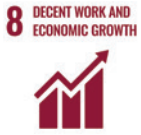
Her outstanding novel earned her three awards, including the 2016 Nigerian Writers Award for Best Fiction Writer of the Year and a nomination for the African Achiever's award.

Building on her success, Okolie's second publication, *Not Forgiven*, is a collection of short psychological thrillers and also won accolades, paving the way for her to receive Most Outstanding Fiction Writer of the Year in 2017. In January 2019, Okolie was listed among the 100 Most Influential Young Nigerians by Avance Media.

Read more about Chidera Okolie and Nigeria's thriving creative economy online.

Patent Data Show One-Third of Inventions Relate to the SDGs

By *Christopher Harrison*, WIPO Patent Analytics Manager



Patents are a unique source of information. Much of the technical information in them is never published elsewhere and is in a relatively standard format. This makes patents a recognized indicator for science and technology output, and innovation tracking. So, big data analytics using patent data is fast becoming a key metric of progress.

For this new report on innovations related to the United Nations Sustainable Development Goals (SDGs), WIPO collaborated with LexisNexis IP Solutions. Using patent metadata reflecting these SDGs, their experts found 100 distinct categories of technologies linked to these goals. (You can find out more about the LexisNexis analysis online.)

By aligning patents with the SDGs, it is possible to identify those areas of innovation contributing the most to our shared goals. We can also find emerging areas alongside those that are still under-represented. In combination with patent analytics, which shows how specific technologies contribute to each SDG, such an approach can support strategic decisions in R&D, innovation policies, IP commercialization and licensing, as well as research collaboration in the public and private sectors.

> Patents represent 13 of the 17 goals, and nearly one in three patents now relate to the SDGs.

Globally, there are over 15.2 million active patent families – a collection of patents associated with the same invention. More than 4.7 million are already linked to the SDGs.

The UN General Assembly established the SDGs in 2015. The 17 global goals capture 169 specific targets that cover social, economic and environmental issues, and provide a blueprint for international peace and prosperity by 2030. Patents are by their nature clear signs of innovation, so aligning them with the SDGs is a vital indicator. Patents represent 13 of the 17 SDGs, and 31.4% of active patent families worldwide now address the SDGs.

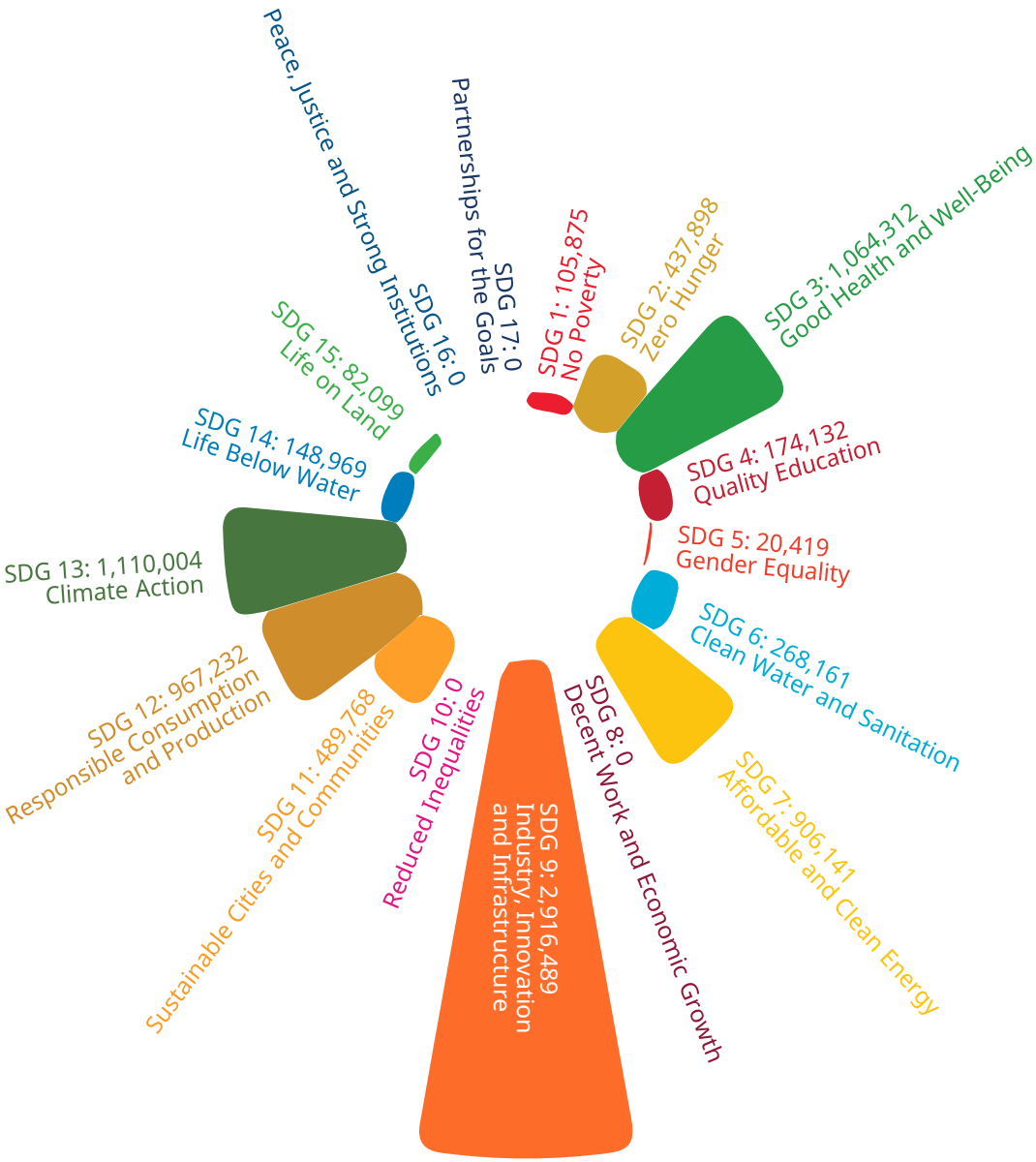


Figure 1: The current number of active patent families associated with each of the 17 SDGs that cover relevant technologies. Source: WIPO, based on patent data from PatentSight, January 2024

But crucially, four of the 17 goals don't map to patents. Those goals are SDG 8 'Decent Work and Economic Growth,' SDG 10 'Reduced Inequalities,' SDG 16 'Peace, Justice and Strong Institutions,' and SDG 17 'Partnerships for the Goals.'

Analysis of patent trends also shows that some targets are advancing faster than others. SDG 9 'Industry, Innovation and Infrastructure' is one example. This field leads and has the highest number of patents (2.9 million active patent families), showcasing the scope of the SDGs within this field. It covers electronics, manufacturing and materials, all areas that are heavily patented and prominent in the analysis. Its global share of active patents rose from under 10% to about 20%.

Alongside innovations in industry and infrastructure (SDG 9), those contributing to climate action (SDG 13) feature most strongly. SDG 7, which addresses the need for affordable and clean energy, is on the rise. A total of 1.1 million active patent families contribute to climate action, with another 900,000 contributing to cleaner energy. 'Climate Action' (SDG 13) is driven by technologies aimed at curbing greenhouse gas (GHG) emissions, while 'Affordable and Clean Energy' (SDG 7) benefits from advances in renewables like solar and wind power. Both show a slightly stronger upward trend than most other SDGs, reflecting a growing awareness among consumers of cleaner alternatives.

> Analysis of patent trends shows some targets advancing faster than others.

Emerging innovations relating to socioeconomic SDGs

Green technologies are vital. But more broadly the SDGs recognize that we must end poverty and other deprivations. Doing this goes hand-in-hand with strategies that improve health and education, reduce inequality and spur economic growth. And patents related to social and economic SDGs, like the calls for an end to poverty (SDG 1), quality education (SDG 4), clean water and sanitation (SDG 6) and sustainable life below water and on land (SDGs 14 and 15) are gaining interest.

At the same time, those SDGs focused on socioeconomic aspects have limited patent connections because they are not tech-driven like some other SDGs. Looking at certain technologies, however, still reveals their progress. Take 'No Poverty' (SDG 1) as an example. Innovation is primarily driven by adding blockchain technology within this SDG. This technology has significantly contributed to advances in agriculture and food security. A blockchain database stores data in blocks linked together in a chain. This can improve the traceability of food, thus ensuring an adequate food supply for those who need it. Blockchain also drives transparency and can improve food safety and quality within the supply chain by stopping contaminated food from entering the market. Blockchain also has the potential to ease trade and access to global value chains, especially for small businesses in developing economies, and can help provide more effective government services.

The Innovation Maturity Matrix for SDG-related patents highlights which SDGs are current hot topics, meaning they have many patents and have grown strongly over recent years. The Matrix can also help find emerging interest in areas that might otherwise be harder to spot when looking at absolute numbers of patents because these areas are dwarfed by those segments with lots of patents.

Aligning specific technologies and SDGs

Patents are classified by the International Patent Classification (IPC). This is a hierarchical system used by most IP offices worldwide to group patents into specific technology sectors. Much like a library classification system for books, it allows patents relating to a specific technology to be quickly found.

To provide enough detail for the analysis presented in the report, the WIPO technology concordance table was also used. This table links IPC symbols to 35 fields of technology, each within one of five sectors, namely Electrical Engineering, Instruments, Chemistry, Mechanical Engineering and Others. This deeper analysis shows the alignment between specific technology fields and the SDGs. For instance, it connects SDG 3, 'Good Health and Well-Being' to pharmaceuticals and other biological and medical fields owing to the finer detail provided. Similarly, SDG 2 'Zero Hunger' aligns significantly with food chemistry, and SDG 11 'Sustainable Cities and Communities' with civil engineering.

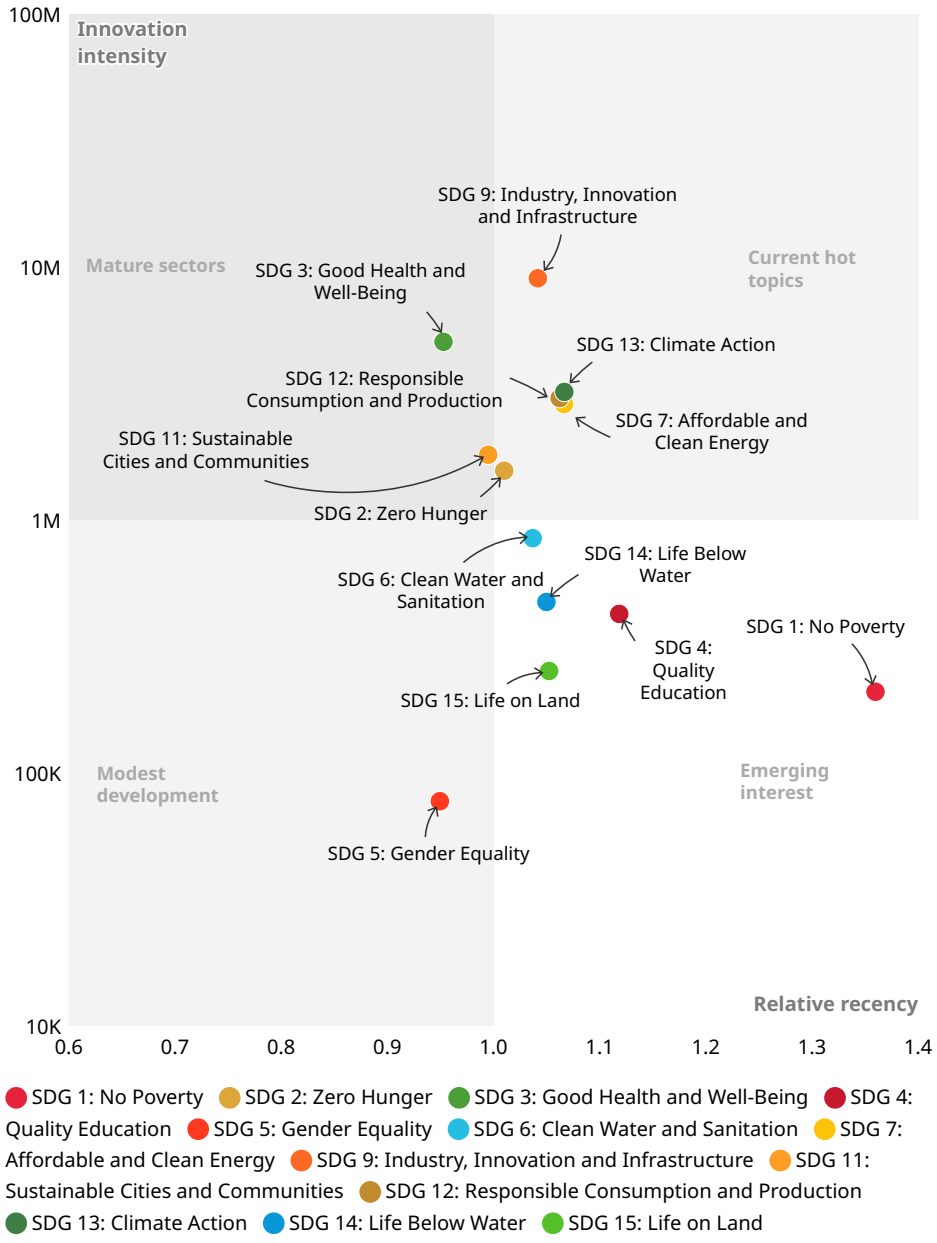


Figure 2: The Innovation Maturity Matrix helps identify those emerging technologies contributing to the SDGs alongside hot topics and mature sectors. Source: WIPO, based on patent data from PatentSight, January 2024

In broader terms, Chemistry holds the largest proportion of SDG-related patents, encompassing pharmaceuticals and innovations for cutting GHG emissions. Within the Chemistry sector, biotechnology and pharmaceuticals have battled for second and third position for many years, with consistent annual increases. However, by 2018, both were overtaken by micro-structures and nanotechnology, which has grown from around 25% in 2000 to nearly 65% in 2023. Environmental technology also aligns well with its description and holds the biggest share of SDG-related patents at about 75%, many relating to the decarbonization of industrial processes. Overall, the share of SDG-related patents in micro-structures and nanotechnology, pharmaceuticals, and environmental technology are progressing toward 100%, albeit coming from an already high level.

> The top patent applicants with the most SDG-related patents in their IP portfolios are a mix of corporations and research organizations.

Industry, academia and research organizations are all driving sustainable innovation

The SDGs are an urgent call for action by all countries – developed and developing – in a global partnership. Our analysis shows that the top patent applicants with the most SDG-related patents in their IP portfolios are a relatively even mix of corporations and research organizations.

Among the key industry players are CATL and Samsung SDI for batteries, along with Roche and Merck for pharmaceuticals. However, electronics companies such as Qualcomm, Ericsson, Baidu, LG Electronics and TDK have the highest growth rates.

Within academia and research, the University of California and the Chinese Academy of Sciences lead in SDG-related patents, with significant contributions from academic and research organizations across the United States, China, France, the Republic of Korea and Germany.

While specific UN goals like SDG 9 'Industry, Innovation and Infrastructure' and SDG 13 'Climate Action' show substantial patent activity, others focused on socioeconomic aspects have limited patent connections. Nevertheless, upward trends in SDG-related patents, particularly for renewable energy and emission reductions, reflect a growing focus on sustainable technologies.

Mapping patents to the SDGs also reveals intersections, with cross-cutting technologies like blockchain contributing to multiple goals. Analyzing trends by technology sectors and fields therefore gives a measurable insight into the alignment of specific areas, such as environmental and pharmaceutical innovations, with the SDGs.

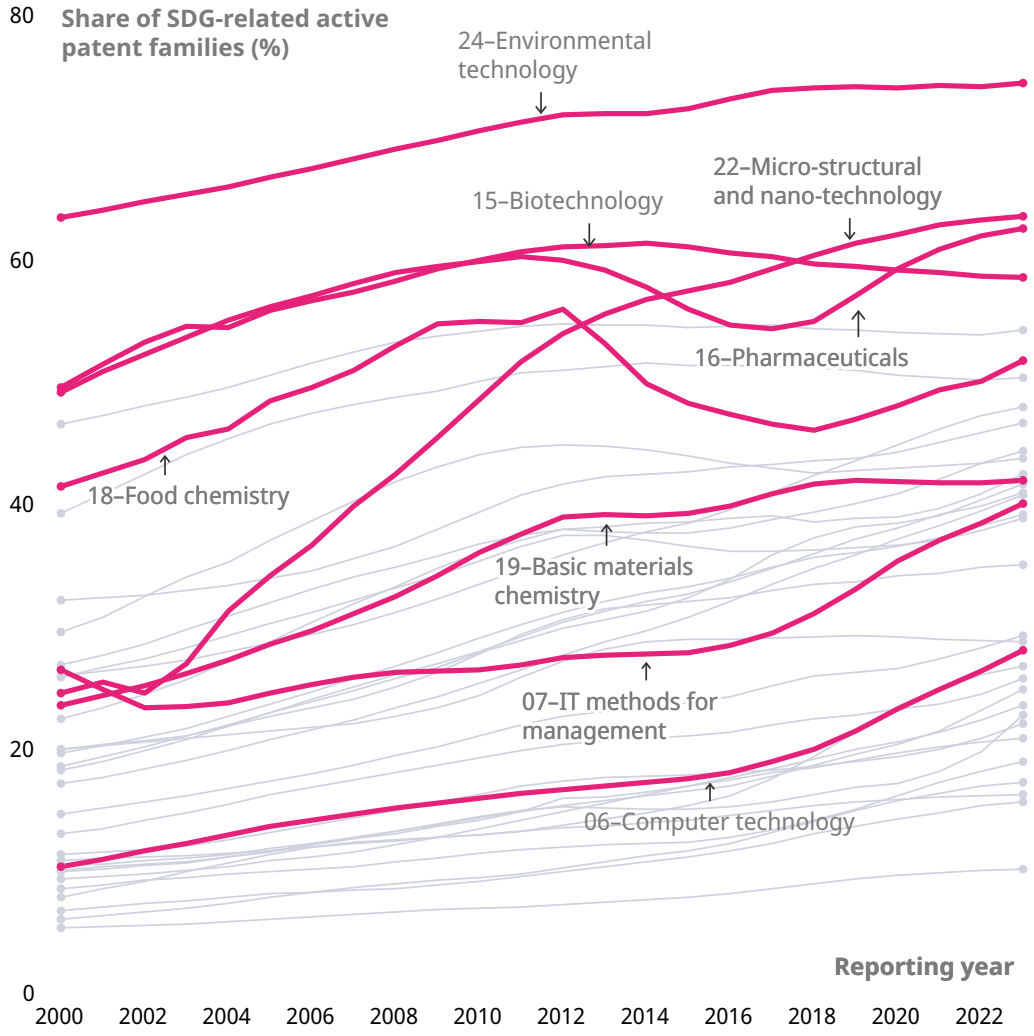


Figure 3: A snapshot of SDG-related patents across 35 technology fields (2000–2023). Source: WIPO, based on patent data from PatentSight, January 2024

Overall, the findings of this new report on innovation related to the UN Sustainable Development Goals illuminate the pivotal role played by intellectual property in steering development toward sustainability. IP empowers decision-makers, policymakers and innovators to make data-driven choices, allocate resources effectively and foster collaboration in those areas where inventive contributions are most needed. With insights from patents informing us on innovation as it relates to the Sustainable Development Goals, we can together actively shape our shared future.

You can now access the full report, Mapping Innovations, as a PDF online.

Photo: Courtesy of Chaoying Zhang

The Dove (Pigeon) pattern holds significant symbolism as it is considered a bird of fidelity and longevity. The embroidered dove motif on both sides, created by Li women, represents the unity and integration of brotherly peoples, along with everlasting peace and tranquility.

IP at Work

The Art of China's Li Brocade: Weaving Tradition and Innovation

The art of Li Brocade is deeply rooted in Chinese culture, combining inherited skills with the continuous pursuit of innovation and creativity. Chaoying Zhang, a Li weaver, is committed to promoting this craft and improving the livelihoods of her community, and training future generations of weavers in the art of brocade, while safeguarding their intellectual property.

For over 3,000 years, the art of brocade weaving has been part of the culture of the Li people, who are indigenous to China's Hainan Island. The term "Li" refers to a number of different groups, including Gai, Ji, Bendi, Meifu and Jiamao. Each group has distinctive garments, designs and accessories that reflect their deep cultural heritage and aesthetic standards, which have endured the test of time. For centuries, the Li people have developed a comprehensive array of techniques that encompass spinning, dyeing, weaving and embroidery. In 2006, these artisanal skills were officially recognized by the National List of Intangible Cultural Heritage of China and were later included in the UNESCO List of Intangible Cultural Heritage in Need of Urgent Safeguarding in 2009.

The weaving of Li Brocade primarily involves the use of cotton yarn, supplemented by additional materials such as twine and silk, as well as gold and silver threads.

Photo: Courtesy of Chaoying Zhang

Empowering communities

The lifeblood of this ancient craft has been the transmission of skills across generations. In recent decades, however, the number of women practicing the craft has declined, posing a threat to the continuity of traditional Li textile techniques and practices. To help ensure the craft thrives for years to come, Chaoying Zhang, who learned how to weave Li Brocade from her grandmother, established Baisha Canran Li Brocade Handicrafts in 2016 with the backing of her parents and the local government. “It is crucial for me to raise awareness about the unique appeal of Li Brocade culture in Hainan,” she says.

To ensure the preservation of Li Brocade skills, Baisha Canran Li Brocade Handicrafts organizes public training courses that offer practical guidance and hands-on experience of the craft. “My community brings together women from the villages and regularly organizes public training sessions on the traditional skills of Li Brocade. Qualified trainees receive materials to make Li Brocade at home. This allows them to follow our standardized specifications and procedures when using materials and patterns, and well-established production practices. In this way, the products they make meet our quality standards and specifications,” explains Chaoying Zhang.

> Preserving Li Brocade serves the dual purpose of protecting the Li people’s rich cultural heritage and fostering new ideas and creativity to ensure this age-old craft continues to evolve.

Recognizing the importance of attracting young people to the craft to ensure it continues to thrive, Chaoying Zhang also started sharing short videos of her designs on Douyin, one of the most popular social media platforms in China among GenZers. She also organizes regular online and offline events to inspire young people to engage in preserving Li Brocade craftsmanship.

The role of IP for Li Brocade

IP rights play a crucial role in preserving and promoting the intangible cultural heritage of the Li people. Various initiatives supported by the local community, central government and WIPO, have succeeded in raising awareness among artisans of how IP rights can support their work, enabling them to generate income from their craft, hone their skills and support the craft’s long-term development.

Photo: Courtesy of Chaoying Zhang

The pattern symbolizes Hercules, who is considered the creator of heaven and earth within the Li culture.

"Oriental Li Brocade" is now a registered geographical indication (GI) and trademark. Patents and utility models have been secured for some weaving equipment used to produce Li Brocade, and selected Li Brocade works are also protected by copyright.

"By utilizing these IP rights, Li Brocade weavers have been able to generate new designs and improve their weaving techniques. Some weavers have even established their own businesses to market and sell their products," Chaoying Zhang explains.

Through strategic use of IP rights, weavers of Li Brocade are also able to ensure the quality and authenticity of their craft. These rights enable them to defend themselves against any unauthorized usage or misrepresentation of their work.

Chaoying Zhang is particularly keen to equip young Li people with knowledge about IP rights, which she believes is crucial for sustaining and advancing Li Brocade traditions for future generations. "IP helps to protect the innovations and technical advancements made in the field, ensuring that traditional weaving techniques can be preserved and enhanced for future generations," she explains.

Learn more about the Art of China's Li Brocade in the full feature online.

Air Quality Monitoring for a Healthier Environment for All

New York City skyline draped in smoke from Canadian wildfires in July 2023, causing hazardous air quality. The presence of carbonaceous aerosols causes air pollution, which has a significant impact on climate change and health.

With widespread forest fires, inner city smog and pollution, air quality is a major concern for national, regional and local authorities and citizens everywhere. But you can't manage what you don't measure. This is where the Slovenian company Aerosol Magee Scientific, a leading developer and manufacturer of air monitoring systems to measure air quality, is playing a key role. WIPO Magazine recently met with Aerosol's CEO, Mateja Forštnarič, to find out how the company is helping policymakers develop clean air strategies, and how IP is supporting its innovation drive in this key area.

What exactly are carbonaceous aerosols?

Carbonaceous aerosols are a major group of air pollutants that, in simple terms, consist of black carbon and organic carbon. Black carbon consists of tiny particles of dust and soot that float in the air. On inhalation, these particles go deep into the lungs and enter the body, causing chronic health problems,


Photo: NYC Stock Photos / iStock / Getty Images Plus

like heart disease, asthma and others. Most particulate matter (PM) in the air consists of black carbon and carbonaceous aerosols, making up 80% of such PM. That's why it's important to understand the composition and source of PM, because only then can we tackle the problem.

> Black carbon aerosols come from the incomplete combustion of fossil fuels and biomass.

Black carbon aerosols come from the incomplete combustion of fossil fuels and biomass. They're generated from traffic, ships, airplanes, industrial activity and certain agricultural practices, as well as wildfires and wood burning for heating.

And what is the scale of their impact on the environment and health?

Black carbon contributes to global warming because it absorbs the sun's energy and light. It also affects cloud formation and rainfall patterns. That explains why we are experiencing more violent storms, rains and floods. Also, when black carbon is deposited on snow and glaciers, it accelerates melting.

A great deal of evidence also links air pollution with neurological, respiratory and immunological diseases including cancer. Air pollution causes around 7 million premature deaths globally every year. The human and economic costs are huge. The World Bank estimates the cost of the damage to health of air pollution caused by PM 2.5 (fine particles with a diameter of 2.5 micrometers or less) is USD 8.1 trillion a year, equivalent to 6.1% of global GDP.

> Air pollution causes around 7 million premature deaths globally every year.

Air pollution is a sustainability issue. And sustainability is an integral part of our vision and mission. We are all fully committed to helping to ensure we can all breathe cleaner and healthier air. While we are a commercial business, raising awareness about the sources of these air pollutants and their negative impact is central to our mission.

Photos: Courtesy of Aerosol Magee Scientific

Testing of new Aerosol Magee Scientific instruments at EUPHORE in Valencia, Spain, a major international outdoor simulation chamber for research on atmospheric pollution, air pollutant effect, forest research, meteorology and climatology.

Remote, high-altitude measurement of black carbon with Aerosol Magee Scientific's instruments in the Himalayas. Aerosol Magee Scientific instruments are used by several organizations in China, India, Nepal and Pakistan to help them understand the impact of black carbon.

Why are users turning to your air quality monitoring devices?

To manage something, you first need to measure it, and you need to collect data over the long term to understand trends. Our instruments measure and gather data on air quality and the source of the pollution. With these data, leaders and decision-makers can introduce and monitor the impact of targeted measures supported by relevant guidelines, standards and policies. Developing and continuously refining the instruments needed to measure air quality accurately, and providing the expertise to interpret the data they generate, is our core work.

Can you give us examples of where devices are being used?

Our instruments are installed on all continents, from the North Pole to the South Pole, from the Amazon to the Sahara, from mines deep in the ground to the heights of Mount Everest; and in monitoring agencies and networks from San Francisco to Shanghai, from Dublin to Delhi, and everywhere in between. We have contributed to more than 300 scientific articles and conference presentations, and our instruments are referenced in more than 8,000 scientific papers. We collaborate with leading research institutions and organizations around the world on various research and development projects.

Why are there no standards or regulations for the measurement of black carbon and other carbonaceous aerosols?

First, because aerosol science is a young science. The scientific community only identified black carbon as an important contributor to climate change in the 2000s. And second, because you need long-term measurements and evidence to convince decision-makers.

> To manage something you need to measure it first, and you need to collect data over the long term to understand trends.

At present, only six pollutants are regulated, including PM 2.5. We would certainly like to see more done in this area. However, in 2021, for the first time, the World Heath Organization (WHO) and the Intergovernmental Panel on Climate Change (IPCC) acknowledged that black carbon and carbonaceous aerosols are causing climate change and adverse health outcomes. This was a major step forward, especially as these organizations are now urging governments to systematically and continuously measure air quality, and the impact of black carbon and carbonaceous aerosols specifically. Only with these data can governments take effective, targeted action and develop the policies, procedures and standards needed to mitigate air pollution. So, things are moving in a good direction, but there is still more that needs to be done.

What are the key challenges you face as a business involved in green technology?

As air pollution is now on the agenda of decision-makers and policymakers and public concern rises, we are seeing new technologies and new players enter the market. In this evolving landscape, the primary challenge is to ensure our technology integrates with these emerging technologies, while also continuing to innovate and develop our own solutions. We're also facing a talent shortage. Finding the right people in the right place is a big challenge. And of course, we have an ongoing communications challenge in raising awareness about the need to measure these pollutants and their impact.

How is IP supporting your business?

Our IP rights are central to our commercial success. They enable us to generate revenue and grow our business. We use patents and trademarks to safeguard our innovations and our brands. By ensuring that our cutting-edge products and technologies remain exclusive to our company, our patents give us a competitive market advantage. Some competitors have already tried – unsuccessfully – to mimic our patented solutions. Our trademarks distinguish our products and services from those of our competitors and enable us to create a unique identity that resonates with our expanding customer base.

> Our IP rights are central to our commercial success. They enable us to generate revenue and grow our business.

And what is your message to environmental policymakers?

You can't manage what you don't first accurately measure and continue to monitor. That's why it's important to measure black carbon and other carbonaceous aerosols over a long period. Our equipment provides reliable and trustworthy quantitative data. Only when you have these data can scientists advise on the targeted action, policies and regulations needed to improve air quality. And these measures require systematic monitoring as to their effectiveness in reducing air pollution and negative health outcomes.

Read the full interview online and learn more about Aerosol and why air quality monitoring matters.

An average cow produces around 500 liters of methane per day. Mootral's innovative natural animal feed supplement is tackling climate change, one cow at a time.

IP at Work

Saving the Climate, One Cow at a Time

Mootral, a Swiss AgriTech startup, produces a natural animal feed supplement that significantly reduces methane emissions from ruminants – animals that chew their cud, like sheep and cattle.

Photo: Courtesy of Mootral

Photo: Courtesy of Mootral

Thomas Hafner,
Founder of Mootral.

You might ask, what's the problem? Well, over the last five years methane emissions have increased by 50%. And over a 20-year period, methane traps up to 84 times more heat than carbon dioxide (CO_2), according to NOOA Research News. As ruminants, cows produce methane; the average cow emits 500 liters of methane every day. So, while livestock produce high-value foods such as milk and cheese from straw and grass, and make an important contribution to a healthy human diet and global food security, it is really important that we find a way to reduce the levels of methane they produce.

About the technology

Mootral is a natural feed supplement that is the result of extensive research and development. It is based on a proprietary combination of active compounds from garlic and bioflavonoids derived from citrus. The company's research shows a nearly complete inhibition of emitted methane in laboratory experiments (in vitro) and, depending on animal breed, age, farm conditions and feed regime, a reduction of up to 38% under real farm conditions (in vivo). Mootral can be easily integrated into the feed chain to suit the needs of different farming systems.

Mootral and intellectual property rights

Mootral is covered by a number of patents. These rights protect the innovation and make it possible to exclude others from making, using and selling the invention. At this stage, the company's innovation focus is on reducing the methane production of ruminants. Mootral has also sought to protect its technology internationally through WIPO's Patent Cooperation Treaty.

IP protection is especially important for a startup like Mootral that doesn't have the same market power as big players. Startups need to protect their innovations because only then does it make sense for them to keep innovating and developing new solutions. The 20-year term of exclusivity that a patent provides gives these businesses an opportunity to advance their work and to come up with new patentable creations that further enrich existing platform technologies that seek to solve existing and future problems.

"Climate change is the defining issue of our time," says the team at Mootral. The path to success will require innovation across every polluting sector.

Read more about Mootral's messages to consumers and the beef and dairy industry online.

Mootral is a natural feed supplement that significantly reduces methane emissions from enteric fermentation of ruminants.

By feeding the 1.5 billion cows on earth with Mootral it would be possible to achieve annual CO_2 reductions** of 1.5 gigatons.

**Global warming potential over 100 years IPCC Standard

Photos: Courtesy of Mootral

Green Technologies for Marine Ecosystems

Photo: Getty Images/Andrew Stowe

Hundreds of millions of people rely on marine life and coral reefs to provide ecosystem services such as food and coastal protection. Climate change and other threats are putting devastating pressure on these marine ecosystems. Traditional conservation is no longer enough. Specific measures to support climate-resilient marine ecosystems are increasingly called for – and technology could play a role.

Regenerating coastal ecosystems

Biorock™ technology, invented in 1976 by marine scientist Wolf Hilbertz, is a cement-like building material that grows and forms layers of limestone over time. Small electric currents are passed between underwater metal electrodes. This causes dissolved minerals to accumulate and form a thick layer of limestone. This results in a growing and self-healing infrastructure whose uses range from artificial reefs to breakwaters. Indeed, the material has multiple applications for regenerating coastal ecosystem services. They include coastal protection, coral and oyster reef restoration and erosion control, as well as the protection of seagrass, salt marsh, mangroves and other ecosystems.

Photo: GettyImages/Madelein_Wolf

Photo: GettyImages/Daynjer-In-Focus

By providing space for settlement and growth, this technology supports ecosystems in surviving and recovering from threats such as warmer temperatures and ocean acidification. Supported by the Global Coral Reef Alliance, around 500 reef structures in more than 40 countries have been built based on Biorock™ technology, with the majority in Indonesia.

Seagrass restoration

Almost 20% of the world's known seagrass has been lost. Warming oceans are one of the factors affecting seagrass growth rate. Seagrasses provide food and habitats for numerous marine species. They are also important to conserve because of their huge capacity for carbon absorption. Research on seagrass restoration has focused on a variety of techniques and anchoring methods. Pilots have included large-scale transplantation trials with both manual and mechanical planting, including with artificial seagrass and biodegradable pots. Traditionally, transplanted seagrass survival rates have been low. But recent transplants are increasingly surviving more than two years. Project Seagrass is an organization focused on the conservation of seagrass. It has planted more than a million seagrass seeds in more than ten countries. The Seagrass Spotter is a global tool developed to help people locate and identify seagrass in support of conservation efforts.

Algae control

Warmer temperatures are worsening algal blooms, allowing them to grow thicker and float to the surface. Further blooming is promoted as the algae absorbs sunlight at the water surface. LG Sonic has developed a chemical-free algae treatment technology using low-power ultrasound. Ultrasonic waves are emitted from a device in the top water layer. This generates a constant pressure cycle around the algal cells. This pressure restricts the algae's movements, blocking its access both to sunlight at the water's surface and nutrients at the bottom of the water column. Deprived of these inputs, algae sink to the bottom and decompose naturally without releasing toxins. The technology has been applied in more than 50 countries.

Find more examples in WIPO's Green Technology Book, which looks at the state of play of green technologies responding to some of the most critical climate change challenges.

Achieving the SDGs is an All-Hands-on-Deck Affair and Requires Strong Partnerships

By *Edward Kwakwa* and *Irina Chicu*, Global Challenges and Partnerships Sector, WIPO

WIPO Director General Daren Tang (center), World Health Organization (WHO) Director-General Tedros Adhanom Ghebreyesus (right) and World Trade Organization (WTO) Director-General Ngozi Okonjo-Iweala (left) at the WHO, WIPO, WTO Joint Technical Symposium on the COVID-19 Pandemic.

In September 2015, world leaders gathered at the United Nations and adopted the 2030 Agenda for Sustainable Development, setting out a bold action plan to end poverty, inequality and injustice, protect the planet, and ensure prosperity for future generations. At the heart of the 2030 Agenda are the Sustainable Development Goals (SDGs), a universal call for urgent action and a strong commitment to build a sustainable future together while leaving no one behind.


Photo: Violaine Martin / WIPO

From eradicating poverty and hunger to promoting health, innovation, gender equality and environmental sustainability, the ambitious SDGs encompass a wide range of interrelated issues that require comprehensive and collaborative solutions on top of individual commitment. Concerted efforts and strong partnerships among national, regional and global actors are essential. The 2030 Agenda authors note that "All countries and all stakeholders, acting in collaborative partnership, will implement this plan."

It is no secret that great achievements can rarely be attained by a single person or entity, or, as one of the greatest basketball players of all time, Michael Jordan, put it, "Talent wins games, but teamwork and intelligence win championships." Therefore, WIPO has always been interested in joining forces with international organizations, governments, civil society, businesses, academia and others to build a better future for all by promoting creativity and innovation as underpinned by intellectual property.

> SDG 17 is often seen as an enabler for attaining the other goals and does not receive as much spotlight as other SDGs.

While traditionally WIPO's work is primarily connected to SDG 9, which calls for the development of industry and infrastructure, IP, innovation and creativity are instrumental for advancing the other SDGs and their specific targets. Therefore, beyond its fundamental mandate to act as a neutral, inclusive and transparent multilateral forum fostering cooperation among its Member States, WIPO also adopted a multi-stakeholder approach to address pressing global challenges in which IP has a role to play.

SDG 17 is often regarded as an enabler for attaining the other goals, and therefore does not receive as much spotlight as other SDGs. Our experience, however, shows that strong partnerships are essential for several reasons. First, no single stakeholder or entity has all the resources and expertise necessary to address the complex challenges outlined in the SDGs. By using our complementary strengths and pooling resources, partnerships enable the global community to develop and implement solutions that are more effective and efficient.

Additionally, partnerships foster an innovative approach by bringing together diverse perspectives and ideas. Collaborative initiatives promote cross-sectoral learning, knowledge and experience exchange, and lead to the development of novel strategies and practices for achieving successful outcomes.

And finally, partnerships help us to amplify impact by promoting collective action and generating broader support for the SDGs. By engaging a wide range of stakeholders, including grassroots organizations, youth, women, SMEs, Indigenous Peoples and local communities, we work side by side to help build momentum and foster a sense of shared ownership and commitment to the SDGs.

Prominent WIPO initiatives and activities in collaboration with partners contribute to the SDGs

In global health, the trilateral cooperation among WIPO, the World Health Organization (WHO) and the World Trade Organization (WTO) is focused on coordinating the efforts of all three organizations. This is to support policymakers worldwide and help them in addressing public health issues, particularly as they relate to IP and trade. In the context of the COVID-19

Photo: Emmanuel Berrod / WIPO

> Our experience shows that strong partnerships are essential for several reasons.

pandemic, WIPO, WHO and WTO Directors General agreed to enhance the existing cooperation framework. Three workshops have already been organized, reflecting on IP licensing, technology transfer, and sharing of know-how and clinical trial information; accessing and using information resources for the pandemic response; and innovation and access to diagnostics for COVID-19 and beyond.

In the pursuit of advancing global health, WIPO also partnered with the Department of Biotechnology (DBT) of the Ministry of Science and Technology of India, the Indian Institute of Technology Delhi (IIT Delhi) and the Indian Institute of Technology Bombay (IIT Bombay) to launch the WIPO Global Health Innovation Fellowship. This program is to provide training to aspiring medical technology creators, enabling them to recognize unaddressed health challenges, invent corresponding technologies, and equip them with the skills to integrate these technologies into patient care. Four fellows from Africa will be sponsored by WIPO to form the first cohort in 2024.

In the area of clean energy and climate action, the WIPO Green online platform brings together key stakeholders to catalyze green technology innovation and diffusion through its database, network and acceleration projects. Over 150 organizations have partnered with WIPO Green so far to build a network committed to fighting climate change and environmental challenges. From IP offices to ministries, SMEs and Fortune 500 companies, WIPO cooperates with various local stakeholders on developing innovative solutions to address climate change on the ground. For example, the Acceleration Project in Latin America is aimed at fostering sustainable technology solutions related to climate smart agriculture and to further developing connections between technology seekers and providers around the issue of food security. WIPO's project partners include the national IP offices and other government entities in Argentina, Brazil, Chile and Peru.

From IP offices to ministries, SMEs and Fortune 500 companies, WIPO cooperates with many local stakeholders on solutions to address climate change on the ground.

Regarding quality education, the WIPO Academy leads our work on inclusive access to IP knowledge and skills. For example, in collaboration with UNESCO, the WIPO Academy is scaling up education opportunities for girls and female scientists in STEM. The ATAL Innovation Mission (AIM) constitutes a cooperation agreement between WIPO and the National Institution for Transforming India (NITI) aiming to work together on aiding WIPO Member States in the creation of innovation labs, incubators and other activities that will cultivate essential IP skills among youth. The Innovation Hubs – TANIT project was developed in collaboration with the Tunisian Ministry of Youth and Sports (MOYS), the National Institute for Standardization and Industrial Property (INNORPI) and the Tunisian Organism for the Protection of Copyrights and Related Rights (OTDAV). Within the framework of this project, WIPO has already delivered preliminary training for 50 Tunisian youth at the Mannouba Youth Center.

On gender equality, an IP and Gender Working Group was set up by WIPO in 2023 to promote and support gender initiatives and partnerships focusing on the economic empowerment of women and other under-represented communities. The International Trade Centre (ITC), WTO's Gender Research Hub and other organizations are WIPO'S key partners in developing these initiatives.

Building collaboration comes with challenges

While these and many other successful partnership examples are at the heart of WIPO's work on SDGs, that does not mean building collaborations is a challenge-free process. WIPO is very careful about choosing the right partners and examining their accountability and transparency. The recently established Partnerships Review Committee has the role of reviewing the

Photo: Emmanuel Berrod/WIPO

WIPO Training and Mentoring Program on IP for Women Entrepreneurs from Indigenous Peoples and Local Communities.

due diligence process undertaken by WIPO's divisions and units before entering partnership arrangements that involve a financial contribution from the Organization. The goal is to ensure that our prospective partnerships will generate the best results in the safest and most cost-effective manner.

> Achieving the SDGs is indeed an all-hands-on-deck affair that demands strong collective action.

Despite potential challenges, the imperative for forging effective partnerships remains essential for WIPO and its commitment to achieving the SDGs. As we have already surpassed the halfway mark of the 2030 Agenda implementation timeline, accelerating progress toward the SDGs requires renewed commitment and action on all levels. Achieving the SDGs is indeed an all-hands-on-deck affair that demands strong collective action. By working together across sectors and borders, we can harness the collective power of humanity to build a more equitable, sustainable and prosperous future for all. The time for action is now, and the success of the SDGs depends on our ability to unite in pursuit of a shared vision of a better world.

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