GLOBAL INFORMATION SOCIETY WATCH 2020

Technology, the environment and a sustainable world: Responses from the global South

Association for Progressive Communications (APC)
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ITALY

ENVIRONMENTAL SUSTAINABILITY: TRANSFER OF TECHNOLOGY AND EXPERIENCES FROM ITALY TO COUNTRIES IN THE GLOBAL SOUTH

Eurovisioni
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www.eurovisioni.eu

Introduction [12]

Given its position at the centre of Mediterranean and its proximity to Africa, the Middle East and Asia, Italy has always been the door to Europe for these regions. This explains why there are many dedicated bodies that work in Italy with decades of experience in cooperation with these neighbouring regions. Over the last 10 years, some of these bodies have refocused their action on sustainability, including in technology and innovation. Many of the projects initiated have moved from the experimental phase to the implementation phase. Various centres of excellence and universities based in Italy are now closely working with African and Asian colleagues on common projects on the theme of sustainability.

According to the UN, "sustainable development" is defined as:

- Development that meets the needs of the present without compromising the ability of future generations to meet their own needs.
- Development that involves concerted efforts towards building an inclusive, sustainable and resilient future for people and planet.[3]

For sustainable development to be achieved, it is crucial to harmonise three core elements: economic growth, social inclusion and environmental protection. These elements are interconnected and all are crucial for the well-being of individuals and societies.

Background

Historically and culturally, Italy has always been a natural bridge between Europe, Africa and the Middle East. This role was encouraged by the Italian governments after World War II and the end of Italian colonisation, with cooperation policies in the cultural, educational and scientific sectors. From the 1950s until the 1980s, thousands of young African and Arab students came to Italy to study in some specialised fields, chiefly at Perugia's university for foreigners and in Rome, where courses were organised in various languages. In the 1980s, because of budgetary restrictions (due to the huge state budget deficit), most of these policies stopped abruptly and only a few selective measures survived.

The progressive digitalisation of courses over the past 10 years, including training and research activities, has created new opportunities to relaunch the cooperation, often using virtual technologies or remote participation tools.

The new forms of cooperation in the digital era are the work of specialised public bodies that very often develop their policies and interventions in least-developed countries in close cooperation with NGOs, either in Italy or in the country where an initiative is being launched.

To this end, in 2014 Italy's Foreign Ministry created a special agency for international development cooperation[4] called *Agenzia Italiana per la Cooperazione allo Sviluppo* (AICS).[5] Every year, the AICS finances projects in countries that are of interest to Italian foreign policy strategies (but not only limited to these), notably in North Africa, sub-Saharan Africa and the Middle East.[6] The budget for the AICS for 2020 was close to EUR 1.2 billion (roughly USD 1.4 billion), 99% of it spent through specialised agencies, NGOs and third parties.[7]

These resources also support important government actors in the field of cooperation and development, some of them working on innovation, the transfer of technology and skills, and on sustainability. Each of these bodies – the Ministry

1 https://m.facebook.com/profile.php?v=info&lst= 727429487:100006778116561:1598602505& id=100006778116561&refid=17

2 https://dicorinto.it

3 https://www.un.org/sustainabledevelopment/development-agenda

4 https://www.aics.gov.it/wp-content/uploads/2018/04/LEGGE_11_agosto_2014_n_125_ENGLISH.pdf

5 https://www.aics.gov.it/language/en

6 See the list of priority countries at: https://www.aics.gov.it/home-eng/countries/openaid-map

7 The Italian Foreign Ministry's budget for international development cooperation in 2020 was fixed at EUR 1,184,799,358 (total budget). See page 12 of the full document: https://www.rgs.mef.gov.it/_Documenti/VERSIONE-I/attivita_istituzionali/formazione_e_gestione_del_bilancio/bilancio_di_previsione/budget_economico/2020-2022/LB/060-LB-2020-2022.pdf

of Education, University and Research, Ministry of Innovation and Industry, etc. – has its own funding policies within other state budget lines, but when it comes to cooperation with developing countries, most of the initiatives are funded through the AICS resources.

Unfortunately, among the AICS priorities for the cycle 2020-2022, innovation is not included as a separate priority per se. However, the environment is one among the six AICS priorities.[8]

Innovative projects focusing on environmental sustainability[9]

Key Italian agencies involved in development cooperation include the Italian National Agency for New Technologies, Energy and Sustainable Economic Development (ENEA);[10] the National Research Council (CNR),[11] which gathers all research and applied research projects from Italian universities and most of the research centres; and the Italian Space Agency (ASI),[12] which has developed a policy of cooperation with partner countries in Africa and Asia to promote the use of satellite data, and especially in the context of the environment and climate change.

Beyond these main state agencies, there is a network of technical universities (led by Politecnico di Torino,[13] Politecnico di Milano[14] and others) that includes some of the most active universities in the field of technology transfer to least-developed countries. There are also NGOs funded by the AICS specialised in cooperation for sustainable development such as A Sud,[15] an organisation dealing with environmental conflicts in developing countries and women's rights, which has been running since 2003; and the Regional Centre for Cooperation Intervention,[16] which is very active in women's rights, and has developed a branch of action on the environment and risks as a result of climate change.[17]

Many of the ongoing projects of these actors focus on sustainability.[18] The most ambitious is a project by the ASI called PRISMA.[19] PRISMA is a cutting-edge Earth observation system, equipped with electro-optical tools, which integrates a hyperspectral sensor with a medium-resolution camera that is sensitive to all colours (i.e. panchromatic). In other words, this satellite can detect which materials are in the observed surface of the Earth and can signal if something has changed since the last time the satellite passed over it.

PRISMA now covers all of the Earth (thanks to its polar orbit) and can scan each single point of the planet every seven days, with a resolution on the ground of 30 metres. It can detect the level of humidity of the soil (for instance, documenting the progress of desertification and predicting the increased risks of wild fires); the presence of metals (for instance, revealing hidden discharges of dangerous materials); the pollution of oil in the sea and of dioxides in the air, etc.

Since May 2020, the ASI decided to open all of PRISMA's data to communities of researchers and users everywhere in the world, for free, on the condition of no commercial reuse. To use the data one has to log into the portal set up for this purpose[20] and through simply filling in a form, interested communities can submit research projects to the satellite programmers. Specific questions can be raised, such as which kind of pollution exists in a given area, where hidden discharges of toxic waste can be found, or the areas more exposed to the risk of wild fires or of desertification.

In response to the COVID-19 crisis that has severed the physical links between students from abroad and their courses, a group of Italian universities[21] has launched the "Italian Higher Education for Africa" initiative. In cooperation with UNESCO, this consortium of Italian universities will now assist their African university partners to put in place distance learning courses. These courses will focus on technological innovation and sustainable economy, or other areas fulfilling the goals of the UN's Sustainable Development Goals (SDGs) and of the African Union's Agenda 2063.[22]

8 The other priorities for AICS are assistance to persons, peace and democracy, support to prosperity, partnerships and humanitarian assistance.

9 A RAI TV programme about science called Leonardo has assisted in identifying the projects presented in this report. See: https://www.rainews.it/tgr/rubriche/leonardo

10 https://www.enea.it/en

11 https://www.cnr.it/en

12 https://www.asi.it/en

13 https://www.polito.it/index.php?lang=en

14 https://www.polimi.it/en

15 https://asud.net/team-e-mission

16 http://www.cric.it/noi-cric/la-nostra-storia.html

17 Is also worthwhile to mention another two NGOs that are very active in fighting inequalities through sustainability: the Italian Alliance for Sustainable Development (ASviS), led by Enrico Giovannini (https://asvis.it) and Forum Disuguaglianze Diversità, led by Fabrizio Barca (https://www.forumdisuguaglianzediversita.org/our-project).

18 The selection of projects has been made with the help of Silvia Rosa Brusin from the RAI TV programme Leonardo, the leading news programme related to science and innovation in Italy. See: https://www.rainews.it/tgr/rubriche/leonardo

19 https://www.asi.it/en/earth-science/prisma

20 https://prisma.asi.it

21 The Milan Polytechnic and the Universities of Rome (Sapienza), Bologna, Florence, Naples and Padua.

22 The focal point for the initiative is Emanuela Colombo, who is in charge of cooperation and development at the Milan Polytechnic (emanuela.colombo@polimi.it).

The ENEA has a tradition of 50 years of cooperation. It runs a database where all innovative ENEA projects on cooperation are listed.[23] The database includes projects in more than 40 thematic areas and more than 100 countries: from the utilisation of solar energy to green buildings, from IT systems for agricultural weather alerts to biological solutions for treating biowaste.

Most of the ENEA projects are focused on energy,[24] such as MED-DESIRE (a support scheme for renewable energy for Mediterranean countries – Egypt, Lebanon and Tunisia),[25] MATS (a project to develop multipurpose applications using thermodynamic solar power in Egypt),[26] the development of small-scale solar power plants to replace fuel power generators in rural areas (in Ethiopia),[27] and the creation of predictive models on droughts in Africa.[28]

The ENEA also invests in human capital through dedicated projects such as "Be Ready for the Future" (in Burkina Faso), which trains young students, and "Professionals Without Borders" (co-developed with the NGO FOCSIV based in Côte d'Ivoire, Ethiopia and Senegal), which persuades young graduates who have migrated to Europe to return to their country of origin to promote business activities based on IT and innovation.[29] Finally, the ENEA also develops its own technologies for sustainable development that are offered to partners in least-developed countries for implementation and testing. The most recent one is called SeT, an innovative greenhouse system for vertical greenhouse farms, based on photovoltaic technology.[30] This process is used to produce fresh foods in emergency conditions, such as refugee camps, deserts or wastelands.[31]

Other innovative projects include those promoted by the CNR, the Italian National Research Centre. For instance, the CNR's Water Research Institute-IRSA[32] in Puglia is well advanced in developing a technology that cleans waters polluted by industrial processes (applicable for instance to mining waste water), reducing the production of contaminated muds. The acronym for this project is MULESL (which stands for "much less sludge"). It has been successfully tested and proved effective in reducing the quantity of sludge at the water line of a sewage treatment plant in Italy.

The results obtained over a one-year period test phase are impressive: contaminated muds are 77% lower than those recorded for primary and secondary treatment at conventional plants during the same period.[33]

The MULESL system has now been handed over by the CNR to the co-developer (an Italian startup called Cisa Spa). The CNR has started cooperating with various African countries to reduce pollution created by urban liquid waste.[34]

Another very promising technology developed by CNR-IRSA is currently testing the effectiveness of poplar trees to clean contaminated soils. The first testing plant is already successfully operating and is also able to produce biodiesel and zero waste.[35]

Another department of the CNR – CNR-IBE, the Institute for Bio Economy, based in Florence – is also testing the use of drones in agriculture to prevent the effects of drought and preserve food reserves. This initiative is the work of the Drought Observatory,[36] a CNR unit specialised in climate change impact that produces a regular report and provides climate services for the Mediterranean Basin and Central Europe.[37]

Last but not least, Turin Polytechnic has developed the Aquaseek project, a promising solution to produce water from the air, conceived for very dry climates or for areas affected by droughts. The test phase has ended already, and now this technology is being used by a startup called Aquaseek. Aquaseek

23 https://www.enea.it/en/international-activities/international-relations/development-cooperation/enea-atlas-for-development-cooperation

24 For more info on ENEA projects, the focal point is Cristiana Testa: cooperazione_sviluppo@enea.it

25 https://www.enea.it/en/international-activities/international-relations/development-cooperation/enea-atlas-for-development-cooperation/project/med-desire-mediterranean-development-of-support-schemes-for-solar-initiatives-and-renewable-energies

26 http://www.mats.enea.it

27 https://www.enea.it/en/research-development/renewable-energy-sources/concentrated-solar-thermal-energy

28 https://www.enea.it/en/international-activities/international-relations/development-cooperation/enea-atlas-for-development-cooperation/technology/monitoring-and-assessment-of-climate-change-impact

29 https://www.enea.it/it/Stampa/news/cooperazione-al-via-progetto-professionisti-senza-frontiere

30 https://www.enea.it/en/international-activities/international-relations/development-cooperation/enea-atlas-for-development-cooperation/technology/closed-photovoltaic-greenhouse-system

31 Governments or NGOs interested in accessing this technology can contact the Energy Efficiency Technical Unit of ENEA at: cooperazione_sviluppo@enea.it

32 http://www.irsa.cnr.it/index.php/ita

33 Di Iaconi, C., De Sanctis, M., & Altieri, V. G. (2020). Full-scale sludge reduction in the water line of municipal wastewater treatment plant. *Journal of Environmental Management, 269*. https://doi.org/10.1016/j.jenvman.2020.110714

34 CISA is based in Massafra (Puglia). http://www.cisaonline.it

35 Ancona, V., Caracciolo, A. B., Campanale, C., Rascio, I., Grenni, P., Di Lenola, M., Bagnuolo, G., & Uricchio, V. F. (2020). Heavy metal phytoremediation of a poplar clone in a contaminated soil in southern Italy. *Journal of Chemical Technology and Biotechnology, 95*, 940-949. https://doi.org/10.1002/jctb.6145

36 https://drought.climateservices.it/en

37 The Observatory self-defines itself as offering "operational services for decision makers, water management authorities and stakeholders." Maps can be downloaded at: https://droughtsdi.fi.ibimet.cnr.it/dogui

has produced a prototype called "Breathe", now under trial at Princeton University.[38] "Breathe" is an atmospheric water generator that uses low-temperature heat to harvest water from the air, and can be coupled with any kind of heat source. The "Breathe" prototype is contained in a box measuring one cubic metre and can produce up to 50 litres of water per day.

Conclusion

The list of recent and ongoing projects focusing on the environment and sustainability in Italy that can benefit developing countries is very promising. Funds for international cooperation are available and are spent every year, mainly through NGOs[39] and specialised bodies. The panorama of NGOs active in this field is diverse and vast and the range of activities covers a wide area, many of them aligned with the UN SDGs.

Nevertheless, it can be noted that projects linked to sustainability are not the first priority of the Italian cooperation agency, but only one among a significant number of others options. Innovation, digitalisation and technological transfer are also not included among the priorities, and so there is no funding incentive from the Italian government for NGOs to improve and modernise their way of operating in developing countries.

Some of them do this anyway, to reply to new needs and to react to evolving situations, but this is not generally the case. Paradoxically, a huge acceleration in the use of technology resulted from the COVID-19 crisis. For instance, the Italian Higher Education for Africa initiative was in the pipeline for a long time, but took a decisive step forward when the lockdown in Italy prevented students from developing countries from moving to Italy to study.

Another limitation of these projects is their capacity to be financially sustainable. Most of them stop when available funds from the EU or from the AICS, etc. come to an end. This means that local NGOs or governmental bodies are often not equipped to carry on these activities given that they are totally dependent on external aid.

The most long-lasting effects are those produced by investment in human capital, such as the introduction of technological topics in the local school curricula, or the training of local teams of researchers and scientists.

Action steps

In order to improve the situation, Italian civil society would need to fight for:

- Introducing the categories of innovation, digitalisation and technological transfer into the requirements of funding proposals.
- Including measures to strengthen legislation and human resources in digital transformation projects in beneficiary countries (e.g. on privacy and on freedom of choice legislation promoting open source software and apps).
- Improving the investment in human capital, especially through building local capacity for cooperation and for accessing global North funds and projects at universities, research centres, innovative small and medium-sized enterprises and NGOs. This should go beyond the single-funded initiative and build long-term local capacity for cooperation.

38 https://aquaseek.tech

39 To have an idea of the number of NGOs involved, see the list of AICS partners here: https://www.aics.gov.it/wp-content/uploads/2019/02/Elenco_OSC_11_02_2019_.pdf

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The world is facing an unprecedented climate and environmental emergency. Scientists have identified human activity as primarily responsible for the climate crisis, which together with rampant environmental pollution, and the unbridled activities of the extractive and agricultural industries, pose a direct threat to the sustainability of life on this planet.

This edition of Global Information Society Watch (GISWatch) seeks to understand the constructive role that technology can play in confronting the crises. It disrupts the normative understanding of technology being an easy panacea to the planet's environmental challenges and suggests that a nuanced and contextual use of technology is necessary for real sustainability to be achieved. A series of thematic reports frame different aspects of the relationship between digital technology and environmental sustainability from a human rights and social justice perspective, while 46 country and regional reports explore the diverse frontiers where technology meets the needs of both the environment and communities, and where technology itself becomes a challenge to a sustainable future.

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