



United Nations
Educational, Scientific and
Cultural Organization

An abstract graphic on the left side of the cover. It features a blue silhouette of a human head in profile, facing right. Inside the head and extending outwards is a complex, glowing blue network of lines and nodes, resembling a circuit board or a digital brain. The background is a solid dark blue.

Charter of Ethics of Science and Technology in the Arab Region



Charter of Ethics of Science and Technology in the Arab Region

Published in 2019 by the United Nations Educational, Scientific and Cultural Organization
7, place de Fontenoy, 75352 Paris 07 SP, France
and
UNESCO Regional Bureau for Science in the Arab States

© UNESCO 2019
ISBN: 978-92-3-100358-5



This publication is available in Open Access under the Attribution-ShareAlike 3.0 IGO (CC-BY-SA 3.0 IGO) license (<http://creativecommons.org/licenses/by-sa/3.0/igo/>). By using the content of this publication, the users accept to be bound by the terms of use of the UNESCO Open Access Repository (<http://www.unesco.org/open-access/terms-use-ccbysa-en>).

Original title: شَرَعَةُ أخلاقيات العلوم والتكنولوجيا في المنطقة العربية
Published in 2019 by the United Nations Educational, Scientific and Cultural Organization and UNESCO Regional Bureau for Science in the Arab States

The designations employed and the presentation of material throughout this publication do not imply the expression of any opinion whatsoever on the part of UNESCO concerning the legal status of any country, territory, city or area or of its authorities, or concerning the delimitation of its frontiers or boundaries.

The ideas and opinions expressed in this publication are those of the authors; they are not necessarily those of UNESCO and do not commit the Organization.

Cover design: CreMedia
Printed by: CreMedia
Printed in Cairo, Egypt

Disclaimer: This is a translation of the original Arabic version of the Charter that was approved as a guidance document by the Council of the League of Arab States at the Summit Level (see resolution S.R. 772 O.S. (30) - S 3 - 31/03/2019 in the annex). In case of discrepancy, the Arabic version shall prevail.

Acknowledgement

We would like to express deep gratitude to Heads of Arab States for approving the Charter of Ethics of Science and Technology in the Arab Region as a guiding document. The approval came through the adoption by the Council of the League of Arab States at the Summit Level on 31 March 2019 of resolution S.R. 772 O.S. (30) - S 3 - 31/03/2019, which calls on Arab States to disseminate the Charter among their research institutions. We also thank the League of Arab States represented by its Secretary General His Excellency Mr. Ahmed Aboul Gheit, and colleagues in the Intellectual Property and Competitiveness Department at the League of Arab States for supporting this project.

We also express our sincere gratitude and appreciation to Her Royal Highness Princess Sumaya bint El Hassan, President of the Royal Scientific Society in Jordan and UNESCO Special Envoy for Science for Peace, for believing in the Charter project, guiding and supporting it since its inception.

The Charter of Ethics of Science and Technology in the Arab Region is the fruit of the cooperation between the UNESCO Regional Bureau for Science in the Arab States, the League of Arab States and the following regional partners (in country alphabetical order):

- National Council for the Evaluation of Scientific Research and Technological Development (Algeria)
- Academy of Scientific Research and Technology (Egypt)
- University of Technology (Iraq)
- Royal Scientific Society (Jordan)
- National Council for Scientific Research (Lebanon)
- Moulay Ismail University (Morocco)
- Palestine Academy for Science and Technology (Palestine)
- Prince Mohammad Bin Fahd University (Kingdom of Saudi Arabia)
- Khartoum University (Sudan)
- Institut Pasteur de Tunis (Tunisia)

Special thanks to those who contributed to the drafting, editing and coordination of the Charter, namely:

- Advisory group/reviewers (in alphabetical order): Aziz Qmichchou, Bahaa Darwish, Hanan Malkawi, Hany Sleem, Hossam Loutfi, Maha Bakheet, Mouin Hamzé, Nayef Saadé, Samir Boubaker, and Sari Hanafi.
- UNESCO Regional Bureau for Science in the Arab States: Ghaith Fariz (team leader), Jana El-Baba (coordinator), and Ahmed Salah.
- League of Arab States: Maha Bakheet, Omima Nour Elzalam, and Walaa Mohamed.
- Consultant/Editor: Bahaa Darwish.

We also thank all the participants in the sub-regional and national consultative meetings, and in the online consultation that took place through the Charter's website. More than 500 participants from the Arab region, whose names are too many to be mentioned here, expressed valuable comments and suggestions.

Contents

1. Preamble.....	10
1.1. Why a Charter of Ethics of Science and Technology in the Arab Region?	11
1.2. Structure of the Charter	13
2. The Charter of Ethics of Science and Technology in the Arab Region.....	14
2.1. Principles underpinning the Charter	14
2.2. Ethics of production of science and technology	16
2.2.1. Ethical responsibilities applicable to all phases of science and technology production.....	16
2.2.1.1. Responsibilities of Governments	16
2.2.1.2. Responsibilities of institutions engaged in the production of science and technology	17
2.2.1.3. Responsibilities of scientific workers (researchers, scientists, trainers, assistant trainers, technicians and students).....	18
2.2.1.4. Responsibilities of funding agencies of science and technology	19
2.2.2. Training, guidance and supervision	19
2.2.2.1. Responsibilities of Governments.....	19
2.2.2.2. Responsibilities of institutions engaged in the production of science and technology	20
2.2.2.3. Responsibilities of scientific workers	20
2.2.3. Authorship	20
2.2.3.1. Responsibilities of institutions.....	20
2.2.3.2. Responsibilities of the scientific worker/author	21

2.2.4. Publishing of science and research results.....	21
2.2.4.1. Responsibilities of institutions.....	21
2.2.4.2. Responsibilities of scientific workers/researchers.....	22
2.2.4.3. Responsibilities of the Publisher.....	22
2.2.5. Joint science production between multiple institutions.....	22
2.2.5.1. Responsibilities of institutions.....	22
2.2.5.2. Responsibilities of scientific workers.....	23
2.2.6. Evaluation and peer review	23
2.2.6.1. Responsibilities of institutions.....	23
2.2.6.2. Responsibilities of the scientific worker/reviewer.....	23
2.3. The ethics of the transfer and localization of science and technology.....	24
2.3.1. Responsibilities of Governments.....	24
2.3.2. Responsibilities of institutions.....	25
2.4. Ethics of harnessing and using science and technology.....	25
2.4.1. Responsibilities of Governments.....	25
2.4.2. Responsibilities of research and production institutions (public or private).....	26
2.4.3. Responsibilities of individuals	26
2.4.4. Responsibilities of the media.....	26
2.4.5. Responsibilities of society.....	26
3. References.....	27
Annex	30

Definitions

The following terms or phrases, wherever mentioned in this document, shall carry the meaning mentioned here under each term or phrase: (listed in alphabetical order)

Animal(s)

Any living animal used, or intended to be used, in research, testing or teaching.

Author

A natural person who innovates, or contributes to the creation of, a science work or technological invention and formulates it using a mode of expression.

Charter

A document setting out the value framework, the principles to be followed and the responsibilities arising therefrom.

Environment

All elements, which in their totality and inter-relationships, form the framework of living conditions, by their very existence or by virtue of their impact.¹

Human dignity

An inherent and moral characteristic that a person enjoys for being human.

Human subject

The individual who agrees with his free choice to be a subject of research.

Intellectual property

Creations of the human mind (such as inventions; literary and artistic works; symbols, names and images) used in commerce.

Make (something) available

Make it accessible to all.

Publishing

The distribution of a number of copies (paper or electronic) of a scientific research to meet the reasonable needs of the public, in addition to providing access to the same research through the information network.

¹ Larsson, M. L. 2009. Legal Definitions of the Environment and of Environmental Damage. Stockholm Institute for Scandinavian Law 1957-2009, p. 156. Available at: <http://www.scandinavianlaw.se/pdf/38-7.pdf>.

Rules of procedure

Legislative controls governing work within a particular body with a view to regulating the behavior and practices within it.

Science

A mental and practical activity which includes a methodical study of the structure and behavior of the natural world through observation and experimentation.

Science production

Reaching a solution to a problem by understanding a natural, social, or human phenomenon or the relationship between phenomena using the scientific method.

Scientific research

A structured process using a specific approach aimed at understanding a natural, social or human phenomenon, or the relationship between certain phenomena, or to solve a particular problem.

Scientific workers

All those associated with the production, transfer and harnessing of science and technology, including researchers, scientists, trainers, assistant trainers, peers, technicians, students, etc.

Transfer and localization of science and technology

Transfer is the process by and through which the experiences of others or the results of knowledge are transferred to an organization or a unit in a particular organization or a country through its specified organizations or institutions. Whereas localization requires the production and use of knowledge internally.²

Vulnerable

Individuals (or groups) at risk for not being able to protect their own interests fully and independently, either because of a characteristic (e.g. age) or circumstances (e.g. prisoners, poor people, etc.).³

² United Nations Development Program & Mohammed Bin Rashid Al Maktoum Knowledge Foundation. 2014. Arab Knowledge Report 2014: Youth and Localization of Knowledge. Dubai: United Arab Emirates, p. 41.

³ Presidential Commission for the Study of Bioethical Issues. 2016. Vulnerable Populations: Background.



1. Preamble

Science and technology are among the most important pillars and foundations of sustainable human development. They play a key role in understanding and addressing growing social, economic and environmental challenges through the creation and application of scientific solutions. Although this important role for science and technology is not new to human societies, the Sustainable Development Goals (SDGs) included in the 2030 Agenda for Sustainable Development⁴ have acknowledged science and technology to be at the center of human development processes foreseen for the next two decades. The 2030 Agenda has indeed been labeled as a «science and technology agenda». This approach is critically needed in the Arab region, which faces many accumulated and complex human development challenges that require the urgent and effective intervention of science in dealing with them. In a region suffering from a wide science, technology and knowledge gap – as recognized in many reports and studies – the most urgent interventions include production, transfer and localization, and more importantly, the use of science and technology to deal more effectively with the challenges of human development in the region, in its economic, social and environmental dimensions.

The Arab region is more aware of the importance of building science and knowledge societies to achieve sustainable development. Analyses have shown that some Arab states achieved progress in transitioning to economies that are relatively more focused on science, knowledge, innovation and economic diversification. The resolutions of the Arab summits in recent years also emphasize the political will to promote scientific research, develop Arab capacities in the fields of transfer and localization of science and technology, and build Arab scientific and technological capabilities.⁵ This stems from the awareness that science, innovation and technological progress are essential levers for development.

4 A plan of action adopted in 2015 by all States (United Nations General Assembly Resolution 70/1) «Transforming our world: the 2030 Agenda for Sustainable Development», https://www.un.org/ga/search/view_doc.asp?symbol=A/RES/70/1&Lang=E.

5 Arab League Educational, Cultural and Scientific Organization. 2017. الاستراتيجية العربية للبحث العلمي والتكنولوجي والابتكار (Arab Strategy for Scientific Research, Technology and Innovation). (in Arabic)

1.1. Why a Charter of Ethics of Science and Technology in the Arab Region?

Considering that science and technology are among the main levers of development in the Arab Region, there is a need for an ethical framework to **steer** science and technology into the right direction, and to position them as key factors and critical drivers of change in Arab societies. The change would culminate in the achievement of sustainable human development in its broader and more holistic sense.

This ethical framework is intended to help identify the means to: **protect** the contexts of science and technology, products thereof and scientific workers; **promote** science and technology and support their success, including through the provision of the required legislative and legal tools, human and material resources, as well as the enabling environments, such as state and societal support; **guide** science and technology towards the right course, steering them away from unethical trends and practices that are harmful to humans and the surrounding environment. Hence, came the idea behind this Charter.

For more than 25 years, Arab countries have recognized the importance of formulating codes of ethics as cornerstones for promoting and guiding science. However, most of the codes of ethics that emerged at the national or institutional levels were in the medical and biological sciences. Over time, there has been a growing awareness of the integrated nature of modern sciences and their collective contribution to solving contemporary world problems, which have become clearly interconnected. This was another reason for the need for a charter of ethics of science and technology that is general, and not specific to any one field of knowledge. There has also been a growing awareness that the harm caused by the lack of adherence to ethical controls is not limited to members of one particular society, but can extend to members of many societies, which gives a third justification for adopting a regional Arab approach. In addition, the Arab States share a number of characteristics that justify the adoption of a single regional approach. They share one language, similar development situations and challenges (despite some disparities) and similar geographical conditions. They also face almost the same knowledge and technology gap, particularly in terms of their contribution to the world's science production, which also justifies the need for Arab countries to agree on ethical principles that guide their advancement in the production, transfer and use of science and technology.

The Arab region has many successful experiences in establishing ethical controls for scientific research and technological applications, in spite of the clear differences between these experiences in terms of the scope and level of adoption (law, decree, charter, application at the national level, application at the

level of research institutions solely, medical field, various research fields, etc.).⁶ Arab experiences include but are not limited to the Tunisian experience of issuing the Ministerial decree on the procedures of experimentation with medicines (1990); the Jordanian experience of issuing the Medical Research Law (2001); the Kuwaiti experience of issuing the Ethical Guidelines of Biomedical Research (2009); the Saudi experience of issuing the Code of Ethics of Research on Living Creatures (2010); the Moroccan experience of issuing the Act on the Protection of Persons Participating in Biomedical Research (2015); and the Mauritanian experiment of issuing a law on the donation, cutting and transplant of human organs and tissues (2016). Although the ethics of medical and biological sciences continue to prevail, there have been serious attempts to change this situation, as for example in the Egyptian experience, which culminated in the establishment of the Council of Scientific Research Ethics at the Academy of Scientific Research and Technology (2005); the Sudanese experience of issuing guidelines for ethical conduct in scientific research involving human experimentation (2008); and the Qatari experience in the preparation of guidelines, controls and policies for research on human experimentation (2009), which explicitly stated their applicability to both medical and behavioral sciences; and the Algerian experience of issuing the ministerial decree on the Prevention and Control of Scientific Theft (2016). The most recent experience was in Lebanon, where the «Charter of Ethics and Guiding Principles of Scientific Research in Lebanon» (2016) was developed, identifying responsible practices in scientific research in general, including research ethics in the social and human sciences and in medical sciences. All Arab country experiences can provide a basis for an Arab Charter.

At the regional level, the Arab League Educational, Cultural and Scientific Organization established the "Arab Committee for the Ethics of Science and Technology" in 2003 and launched the "Arab Network for the Ethics of Science and Technology" in 2013 in order to achieve a number of objectives, including raising awareness on the ethics of science and technology and contributing to the development of a joint Arab vision in this regard.⁷

6 More information on Arab experiences in the development of codes of ethics of scientific research and technology can be found in Darwish, B. 2017. Background paper for the UNESCO Regional Consultation on «The Ethics of Scientific Research and Technology Applications in the Arab Region» (Beirut, 11-12 July 2017). (in Arabic)

7 Arab League Educational, Cultural and Scientific Organization. 2014. النظام الأساسي للشبكة العربية لأخلاقيات العلوم والتقانة (Statute of the Arab Network for the Ethics of Science and Technology). (in Arabic)

Within this context, and in the summer of 2017, a number of institutions in the Arab region, under the umbrella of the League of Arab States and with the support of UNESCO, embarked on the elaboration of the Charter of Ethics of Science and Technology in the Arab Region. The Charter would be an overarching umbrella for the different scientific disciplines and technology applications, and would reflect the specificities of the region. The draft of this proposed Charter was therefore developed.

1.2. Structure of the Charter

The world continues to witness sustained progress and change in all fields of science. The proposed Charter - albeit based on firm human values - is bound to be broad and flexible, yet firmly structured, to allow adaptation to the ever-changing and evolving demands of science, and to be in line with the reality of human development in the Arab region and the requirements of advancing development in a sustainable way, in economic, environmental and social terms.

This proposed Charter sets the ethical principles for science and technology in the Arab region in a holistic manner, without going into the ethical particularity of different scientific fields or of any of the Arab countries individually. While acknowledging the importance of this specificity, the intention is that this Charter - which encompasses the ethics of all sciences - shall constitute an overarching umbrella and a reference based on which the charters and legislations required for various scientific disciplines or for different Arab countries are approached according to individual needs.

The scope of the proposed Charter extends to cover the value bases of science and technology in the Arab region in three basic contexts: starting with the production of science and technology; then the transfer and localization of science and technology, which constitute a fundamental stage in the progress of the Arab region under a context of globalization and openness; and ending with the more important stage of harnessing science and technology to serve the different purposes and objectives of sustainable human development.

Within these three contexts, and given that this Charter aims to demonstrate how to protect and guide science and technology to anchor their expected role in development, such protection and guidance translate into many ethical responsibilities of relevant parties, including institutions (like universities and research centers), individuals (science and technology workers including researchers and scientists), governments (as support and protection entities), productive sectors (including productive institutions in the public and private sectors) and society at large (consumers and users of science and technology outcomes).

Hence, this Charter has been divided into the following four sections:

- The general ethical principles underpinning this Charter;
- Ethics of production of science and technology;
- Ethics of transfer and localization of science and technology;
- Ethics of harnessing and using science and technology.

Finally, the aim of the authors of this Charter goes beyond ensuring the voluntary commitment of stakeholders in Arab societies, which is what most charters and codes of ethics do. The aim is to reach social and political acceptance and support for the Charter. This means the support of decision-makers for the adoption and application of the Charter in various Arab countries as a fundamental and philosophical basis towards a legally binding instrument in any form that the Arab governments consider appropriate (e.g. adopting a legislation, or referring to its adoption through other legislations). Only through adoption by all stakeholders can it be said that the effort made in drafting this Charter has borne fruit, and that the Charter would contribute to ensuring that science and technology are steered onto the right path towards the real progress as represented in sustainable development.

2. The Charter of Ethics of Science and Technology in the Arab Region

2.1. Principles underpinning the Charter

Although ethical principles are universal and repeat in almost all global charters and codes, this Charter focuses on ethical principles that help fulfil the objective of advancing science and technology for human development in the Arab region. Accordingly, the Charter is predicated on the following fundamental principles:

❖ **Integrity and safety:** Integrity, objectivity, and truthfulness form the value bases for all processes related to the production of science and technology, notably in the case of scientific research, as well as the transfer, localization and use of science and technology. They guarantee the safety and rights of the parties involved in all these processes.

❖ **Respect for human dignity:** Respect for human dignity is part of, and a prerequisite for, attaining human esteem and progress. Hence, science and technology production, transfer and localization, and harnessing must respect and protect human dignity.

❖ **Animal welfare and the preservation and protection of the environment:** The respect and protection of human dignity are inseparable from, and in harmony with, the protection of the surrounding natural environment, including animals, plants and natural resources such as water, soil, and the atmosphere, as well as the universe in its broader sense.

❖ **Beneficence and non-maleficence:** Although there is consensus that science and scientific research in various fields should be beneficial and non-harming, the urgent application of this ethical principle in the Arab region is even more significant. This is due to the dire need of the region for scientific and technological approaches and solutions to the problems of poverty, food and water shortage, and insecurity, solutions that do not cause harm to humans and other living organisms or to the environment. This principle applies to all sciences, including social sciences and engineering, to ensure they are beneficial, reflect societal interests and address its problems, while also avoiding all forms of harm or damage that may affect research subjects due to lack of respect for their dignity, independence and confidentiality of their data. This principle also stipulates avoiding harm to society, researchers and the surrounding environment.

❖ **Justice and protection of rights:** This principle is clearly reflected in all ethical responsibilities of governments, institutions and researchers. It is also reflected in the respect for the intellectual property rights of all stakeholders, in sustainable development where natural resources are used optimally and rationally, and in the realization of human development for all citizens without discrimination through the provision of fair access to education and all science and technology products, and participation in all social, economic and political activities. An important issue of justice relates to the use of research findings, whether these findings will directly or indirectly affect the participants in the research, and whether the resulting knowledge will contribute to attaining equality and justice.

❖ **Freedom:** Freedom is understood here in its broader sense, beyond freedom of expression and participation, to include individual and community obligations and rights and good governance. This principle is manifested in many respects: it means bringing the individual out of poverty and unemployment, and making available and expanding opportunities for participation for all citizens in all fields without marginalization or exclusion, including gender equity, free access to information and freedom of scientific research. More important in this context is the freedom of thought that leads to innovation, and without which real science and technology cannot be produced.

❖ **Openness and productive communication:** Whether with oneself - to address internal issues transparently and objectively - or with the other - to be open to the region and the world. In science-based and globalized societies, and especially in the context of modern information and communication technologies, communicating with oneself is essential to identify and address gaps and define and build on successes. In addition, being open to, and communicating with, the world are essential and necessary to expand the production, transfer and use of science and technology to serve the purposes of sustainable human development.

2.2. Ethics of production of science and technology

The production of science and technology depends mainly on scientific research, and there are a number of actors that contribute to it, whether directly or indirectly. The protection, promotion, and guidance of the production of science and technology entails ethical responsibilities, some of which are applicable to all phases of science and technology production, whereas others are applicable to a certain phase as shown below.

2.2.1. Ethical responsibilities applicable to all phases of science and technology production

2.2.1.1. Responsibilities of Governments

- a. Develop and enforce policies that promote the production of science and technology and cooperation between science and technology producers (universities and research centers) and users in the different productive and service sectors, both public and private.
- b. Develop and enforce policies that encourage all institutions to establish ethics committees - specialized and intra-disciplinary - to assess the scientific, social, ethical and legal issues of research projects, provide advice on the ethical implications of these projects, and promote a culture of dialogue and awareness of the importance of scientific research ethics.
- c. Adopt ethics teaching as part of compulsory courses as widely as possible and in various disciplines.
- d. Protect public and individual liberties that guarantee freedom of thought and creativity, and take measures to ensure that scientific workers respect public accountability.
- e. Empower all, especially women, to participate in scientific disciplines and other aspects of economic and social life.
- f. Disseminate the culture of public participation and develop mechanisms to enable such participation throughout all stages of national and non-national projects.
- g. Promote policies that guide scientific activities towards strategic areas that serve people in all sectors of society, and ensure capacity building in science, technology

and innovation and their applications.

- h. Provide the best possible working conditions for scientific workers in all sectors where scientific research is conducted.
- i. Codify the protection of traditional knowledge and genetic resources, and have regard to heritage, customs and positive traditions of communities that inhabit the land of a project, in conformity with the principles and provisions of this Charter.
- j. Develop and enforce legislations that conserve natural reserves, coral reefs, plants and animals which are endangered, and prevent harm to them during any scientific research or the implementation of any project.
- k. Regulate the rational use of natural resources, including land, water and mineral resources.
- l. Develop and enforce legislations covering human experimentations and the protection of the lives and dignity of human subjects.
- m. Enforce legislations that protect intellectual property, and related ratified international treaties, and develop the mechanisms required for their operationalization.
- n. Guarantee and enforce legislations that protect the welfare of animals used in scientific research.

2.2.1.2. Responsibilities of institutions engaged in the production of science and technology

The main responsibility of institutions is to provide an ethical environment that is conducive to the production of science and technology and responsible scientific research, through the following:

- a. Adopt the provisions of this Charter and include within the institution's rules of procedure, a code of ethics that clearly identifies the rules governing responsible scientific conduct, and undertake a periodic review of such rules, guided by global ethics documents. The institutional code of ethics should identify irresponsible practices in the production of science and technology, and mechanisms for dealing with such practices.
- b. Promote awareness of charters, rules of procedure, and national and global ethics documents that identify responsible and irresponsible behaviors, policies and procedures for the production of science and technology and scientific research; and make these documents available, and explain them clearly to all workers in the fields of science, technology and knowledge.
- c. Provide continuous training and explanation of these rules of procedure through specialized workshops that build the capacities required for responsible ethical conduct.
- d. Provide continuous supervision and advice on responsible ethical behavior.
- e. Establish ethics committees in all disciplines to supervise the implementation and evaluation of this Charter and the commitment of scientific workers to it.
- f. Provide special spaces for the care of experimental animals that suit their behavioral and biological needs.

2.2.1.3. Responsibilities of scientific workers (researchers, scientists, trainers, assistant trainers, technicians and students)

- a. Be aware of the Charter and the relevant regulations, laws and policies adopted by the State and follow-up on amendments and updates thereof, especially those that promote and regulate various aspects of work in science production and scientific research.
- b. Follow the provisions of the Charter and the relevant internal ethical policies and rules of procedure that are enforced in their institutions.
- c. Respect the ethical and cultural specificities of different societies (religion, customs and traditions) and without infringing the principles of the Charter.
- d. Prevent interference of funding agencies in the results of research.
- e. Limit human experimentation to research that cannot attain its purposes except through such experimentation.
- f. Ensure the good treatment of the human subject, the avoidance of harm to him/her and his/her dignity, and that scientific research is directed primarily to his/her benefit.
- g. Obtain the free and informed consent of the human subject or his/her legal representative for voluntary participation before conducting the research.
- h. Take all appropriate measures to protect the vulnerable and people at risk who participate in research, and adopt appropriate means for obtaining their informed consent or that of their legal representative.
- i. Respect the human subject's independence, privacy, and confidentiality of personal information; personal information should not be exploited for harm, defamation, blackmail or profit; personal data that reveal the subject's identity should not be used without obtaining his/her free and informed prior consent. Such consent shall not include any conditions that infringe on the subject's human rights or prevent him/her from recourse to the law in the event where he/she should suffer any damage due to participation as research subject.
- j. Be aware of the responsibility for animal welfare, and refrain from conducting research on animals without a justified objective.
- k. Limit the use of animals in experiments to research which can only achieve its objectives through such experimentation.
- l. Reduce the number of animals used in research as much as possible and replace them with other appropriate research modes.
- m. Spare animals - as much as possible - from the unjustified infliction of pain before, during and after experimentation.
- n. Establish appropriate conditions for the animals that suit their behavioral and biological needs.
- o. Refrain from contributing to any research project that would be detrimental to the sustainability of the environment and its natural resources and biological diversity.

2.2.1.4. Responsibilities of funding agencies of science and technology

- a. Contribute to the achievement of sustainable human development through funding scientific research that is directed primarily to the benefit of people and which respects human dignity and does not cause harm to animals or the environment, giving priority to research addressing the most pressing societal challenges.
- b. Commit to providing research subjects with access to research results, when such results have proved to be effective and whenever subjects need them, this being a joint ethical responsibility of funding agencies and researchers.
- c. Commit not to impede the publication of funded research results and to avoid interfering in its results.
- d. Refrain from putting any sort of pressure on the researcher at any phase of the funded research to achieve an interest that conflicts with the objectivity of the research.

2.2.2. Training, guidance and supervision

The researcher cannot practice scientific activity with the hoped-for efficiency and quality without training, guidance and supervision. Hence, continuous development of oneself and of others, scientifically and professionally, has become an ethical imperative.

2.2.2.1. Responsibilities of Governments

- a. Adopt measures and policies to ensure equal access to training and work opportunities in scientific research for all - without discrimination based on color, religion, gender, race or other.
- b. Encourage educational initiatives that promote the teaching of all sciences and technology in different schools or educational institutions, and incorporate interdisciplinary topics into science courses and curricula; use teaching methods that strengthen students' personal skills and special mental abilities such as the use of scientific approach; the ability to review a problem in whole or in part and the skills to uncover and isolate the ethical implications of an issue in order to address it.
- c. Properly train personnel involved in the provision of training.

2.2.2.2. Responsibilities of institutions engaged in the production of science and technology

- a. Ensure that all scientific workers, without discrimination, receive continuous training in all phases of science production, starting from the selection of the research problem, through the methodology and structure of the research, and until the publication of research results.
- b. Incorporate into the training environmental protection measures, individual safety and security conditions, and the ethics of scientific research.
- c. Make available the Charter and other necessary documents on responsible research behavior, and the institution's code of ethics, including procedures for the protection of human subjects and animals used in scientific research.

2.2.2.3. Responsibilities of scientific workers

- a. The more experienced scientific workers, or heads of research teams, should supervise those who are junior, develop their skills, train and guide them so they can properly develop their research activities, and to create a healthy research environment.
- b. Consolidate basic ethical standards among young scientists; the mentor (the more experienced and qualified scientist) should provide a role model for those less experienced in the application of ethical principles.
- c. The scientist shall respect his students and the younger scientists and encourage their critical and independent thought.
- d. The scientist shall not hamper or prevent his students from communicating with other scientists and other scientific institutions.

2.2.3. Authorship

2.2.3.1. Responsibilities of institutions

- a. Develop a standard to clarify the concept of "author" in order to avoid any dispute on the eligibility of a person or persons to include his / her / their name(s) in the authors' list. Such standard is often included in the institutional intellectual property policy.
- b. In cases of collective authorship, a "lead author" should be identified to act as the link between the authors of the research work and the publisher.
- c. In cases of joint authorship, one of the involved researchers should be appointed as a general coordinator between them.

2.2.3.2. Responsibilities of the scientific worker/author

- a. Be scientifically proficient in the field of research.
- b. Be highly knowledgeable about references, published scientific articles and the latest developments in his/her field of specialization before choosing the research idea.
- c. Refrain from appropriating others' innovative research ideas.
- d. Be precise and truthful in presenting excerpts or quotations from others, and clearly indicate the source of the quote or excerpt.
- e. Be objective in collecting scientific material.
- f. Avoid using research activity to advertise for any personal purpose, or for any tribal, ethnic or demagogic affiliation.
- g. Deal with research data in all integrity and objectivity and refrain from modifying data to support a particular hypothesis or in response to pressure from the funding body or any other entity.
- h. In the case of joint authorship, the names of all those who participated in the research or in authoring - and only these names - should be included, so that none of the actual contributors is omitted, and no names are added without scientific justification.

2.2.4. Publishing of science and research results

Scientific research and production are not considered complete without responsible scientific publishing that aims to advance scientific research in support of public benefit.

2.2.4.1. Responsibilities of institutions

- a. Ensure that all parties to the scientific research know the nature and limits of confidentiality of primary materials and data used in the research project.
- b. Ensure a clear policy to protect the intellectual property rights of the institution, the funding agency and the scientific workers including researchers and assistant researchers. The policy needs to be consistent with the Charter and the intellectual property laws of the state.
- c. Encourage scientific publishing in internationally ranked, specialized scholarly journals supported by scientifically recognized and competent arbitration panels.
- d. Promote scientific publishing in Arabic.

2.2.4.2. Responsibilities of scientific workers/researchers

- a. Seek to publish results of his/her research for the benefit of the public, to contribute to his/her field of specialization, and to achieve intellectual property.
- b. Refrain from unjustified fragmentation of research results in order to publish them in more than one scientific paper.
- c. Refrain from republishing previously published material, and submitting research for publication to more than one publishing house.
- d. Refrain from declaring as “achieved” those results that have not been fully completed; refrain also from claiming a work to be a “publication in progress” when it has not yet been accepted for publishing or has not yet been evaluated.
- e. Recognize the efforts of all those who contributed to scientific research, however humble the contribution, by clearly mentioning the names of the authors and the role of each contributor in the research, including sponsors and funders.
- f. Publish research in Arabic, in addition to foreign languages, if and as necessary to ensure the wider dissemination of the outputs of science and research.

2.2.4.3. Responsibilities of the Publisher

- a. Follow policies and procedures necessary to ensure the quality and integrity of the published work.
- b. Decide whether to accept or reject the publication of a research based solely on its scientific value and without any interference.
- c. Select arbitrators having recognized competence and avoid all conflicts of interest.
- d. Take utmost care to prevent the disclosure of any information about the research submitted to anyone other than the author, potential arbitrators and publisher.
- e. Report any doubts regarding the manner in which the research was conducted and prepared, its consistency with the ethics of scientific research, as well as doubts about plagiarism, fabrication, counterfeiting, and republication.

2.2.5. Joint science production between multiple institutions

Joint science production between multiple scientific and research institutions has become a tradition and practice dictated by the nature of contemporary multi-disciplinary researches, a matter which has created ethical responsibilities for institutions engaged in science and technology production, and employees thereof.

2.2.5.1. Responsibilities of institutions

- a. Each institution participating in a joint science production shall have a written agreement with the parties involved in the joint science / research project, indicating how to manage such joint science work, the method of distributing the results of intellectual property, and how to manage the primary research materials and data.
- b. Each institution shall have a clear policy for managing conflicts of interest.

- c. If the research includes human experimentation, the approvals of the ethics committees of all participating parties shall be obtained.

2.2.5.2. Responsibilities of scientific workers

- a. Agree from the outset on the objectives and mechanisms of research, intellectual property rights of participants, procedures for resolving any dispute that may arise between participants in the research, and procedures for dealing with any violation that may arise.
- b. Report immediately any potential or actual conflict of interest in any aspect of the science work / research.
- c. The lead researcher shall not exploit his/her influence to achieve personal benefits or abuse the rights granted to him/her to render services, opportunities or facilities to some researchers at the expense of others.

2.2.6. Evaluation and peer review

Evaluation and peer review is an important step in scientific assessment, and includes the review of unpublished research, proposals for a research grant, and complete work submitted for promotion or for an award.

2.2.6.1. Responsibilities of institutions

- a. Encourage their employees and researchers to participate in peer review and evaluation processes.
- b. Train all researchers on the evaluation process in order to ensure that it is professionally completed.
- c. Develop precise scientific criteria for evaluating and reviewing peer work.

2.2.6.2. Responsibilities of the scientific worker/reviewer

- a. Carry out the evaluation and peer review with total objectivity, integrity and impartiality.
- b. Preserve the confidentiality of the research data being reviewed, as well as the proposals being submitted for a research grant.
- c. When asked to evaluate, or give an opinion regarding the work of a peer or party related to him/her, the researcher/reviser shall transparently disclose the possibility of conflict of interest (material or moral) and the possibility of existence of a relationship between the evaluator and the party to be evaluated, which may influence his/her opinion and accordingly subject him/her to the risk of being accused of bias. In this case, the researcher/reviser should decline the work.
- d. Refrain from reviewing any scientific or research work outside his/her specialization as this contradicts with the principle of competence, according to which the researcher must be scientifically proficient and perform only the services that lie within his/her area of competence.

2.3. The ethics of the transfer and localization of science and technology

The transfer and localization of science and technology often involve the production of science. Accordingly, most if not all the responsibilities contained in section 2.2 apply as well to the transfer and localization of science and technology. The ethics of the transfer and localization of science and technology entail the following additional responsibilities:

2.3.1. Responsibilities of Governments

- a. Develop a policy that identifies the strategic areas of science and technology in which transfer and localization should be promoted, from the standpoint of achieving public interest and based on an assessment of scientific and technological needs.
- b. Promote policies and practices of openness and fruitful communication with oneself and with others.
- c. Develop national policies that support capacity building of individuals through expanding opportunities for participation in all fields of economic and service activities for all citizens without exclusion or marginalization.
- d. Promote the culture of scientific thinking so it becomes embedded within the society's cultural fabric. This can be achieved through the development of specific policies, education and media, and the adoption of standards of reference to gauge public attitudes towards science.
- e. Promote awareness and the culture of respecting intellectual property rights.
- f. Enforce the rule of law, especially in the area of intellectual property protection, to ensure the transfer of science and technology and help localization thereof.
- g. Establish a minimum financial allocation in the general budget for the transfer and localization of science and technology and urge institutions operating in all productive sectors to allocate resources in their budgets for that purpose.
- h. Provide the appropriate training and qualification relating to the applications of science and knowledge management within different institutions.
- i. Encourage foreign investment, which is considered as one of the most effective and rapid mechanisms for the acquisition, transfer and dissemination of cross-border science, technology and knowledge.
- j. Provide free public access to information and communication technologies, and training on their use, to promote their vital role in accessing and transferring knowledge, and rapid dissemination of science.
- k. Incentivize Arab immigrants who work in science to benefit their countries with their scientific and knowledge capital and contribute to their country's development.

2.3.2. Responsibilities of institutions

- a. Raise awareness regarding the importance of transferring science and technology as an essential step towards its localization and production in the Arab region.
- b. Develop science and technology management - as a competence embedded in the structure, leadership and culture of the institution - to maximize the return from the science/knowledge capital.
- c. Develop the capabilities and skills of its members in the transfer and localization of science, technology and new knowledge, including the capacity to negotiate access to technology.
- d. Commit to establish, and intensively use, high-efficiency information systems.
- e. Expand regional and global scientific cooperation partnerships to promote growth and develop joint action with all countries.
- f. Funding institutions for science and technology are to provide funding opportunities for joint researches that foster scientific links between researchers and create an environment conducive to the transfer of science and technology.

2.4. Ethics of harnessing and using science and technology

2.4.1. Responsibilities of Governments

- a. Monitor markets, agencies and institutions to ensure that security and safety standards apply to all technology products in use, and protect members of society from all forms of harm that may result from failure to observe these standards.
- b. Evaluate the effects that may result from the wide scale use of certain technologies among members of society to ensure their safe use, taking into consideration the social, economic, environmental and legal dimensions.
- c. Issue legislations that ensure the use of technology products in a safe and sound way that does not conflict with the rights of others or is harmful to others.
- d. Issue legislations that prevent the misuse of information and communication technologies, guarantee the protection of private data and respect the privacy of others.
- e. Provide access to all forms of technology for all members of society to develop their human capacity and allow them to assume their expected role in advancing sustainable development.
- f. Provide access to the outputs of scientific projects for the benefit of all, in order to ensure sustainable human development.
- g. Provide access to the Internet and the means and tools of information and communication technologies to narrow the digital divide between members of society and support the principle of democracy, transparency and accountability.
- h. Protect the freedom of individuals to creatively use and develop all forms of technology while respecting the rights of others.

2.4.2. Responsibilities of research and production institutions (public or private)

- a. Provide a healthy environment characterized by integrity, accuracy and responsibility in publishing, advertising and valorization of research results.
- b. Make the outputs of scientific and technological projects available to all in the interest of justice and equal opportunity.
- c. Within the framework of intellectual property protection, ensure that the entity funding the research does not impede the dissemination of research results for any personal benefit.
- d. Each participating or supporting institution in a joint scientific research shall draw up a written agreement for all the parties involved in the scientific project (theoretical or applied) that clarifies the distribution of intellectual property, especially in terms of the material rewards from the research.
- e. Enhance the capabilities of all their members to secure the use of various types of technology and prevent wrong and harmful uses.

2.4.3. Responsibilities of individuals

- a. Use science and technology products in a rational manner that does not conflict with the rights of others and in a way that preserves the dignity and privacy of others.

2.4.4. Responsibilities of the media

- a. Provide an accurate and correct interpretation of scientific and technological practices and products.
- b. Verify the accuracy, sources and careful drafting of scientific information prior to dissemination.
- c. Avoid discrimination based on gender, race, religion or any other form of discrimination.
- d. Refrain from copying the work of others;
- e. Avoid all conflicts of interest and immediately report any unavoidable conflict of interest;
- f. Declare all errors promptly and publicly and rectify them immediately.

2.4.5. Responsibilities of society

- a. Establish and activate methods and mechanisms of public oversight over the practices of the State, productive sectors (public and private) and institutions based on the standards and ethical foundations of science and technology. Civil society organizations, such as consumer protection institutions, trade unions and professional associations - including syndicates of engineers, doctors and media - can play a key role in this area.

3. References

All European Academies. 2017. European Code of Conduct for Research Integrity (Revised Edition). Berlin.

http://ec.europa.eu/research/participants/data/ref/h2020/other/hi/h2020-ethics_code-of-conduct_en.pdf.

Arab League Educational, Cultural and Scientific Organization. 2014. النظام الأساسي للشبكة العربية لأخلاقيات العلوم والتقانة (Statute of the Arab Network for the Ethics of Science and Technology). (in Arabic)

Arab League Educational, Cultural and Scientific Organization. 2017. الاستراتيجية العربية للبحث العلمي والتكنولوجي والابتكار (Arab Strategy for Scientific Research, Technology and Innovation). (in Arabic)

Australian Research Council & Universities Australia, 2007. Australian Code for the Responsible Conduct of Research.

http://www.hdr.mq.edu.au/information_about/home/bottom_content/Australian_Code_for_the_Responsible_Conduct_of_Research.pdf.

Draft Tunisian Charter on the Ethics of Animal Experimentation (n.d.). (in Arabic).

Estonian Academy of Sciences (n.d.). Code of Ethics of Estonian Scientists.

http://www.akadeemia.ee/_repository/File/ALUSDOKUD/Code-ethics.pdf.

Ethics and Principles for Science & Society Policy-Making: The Brussels Declaration. Text adopted on 17 February 2017 during an announcement symposium at the American Association for the Advancement of Science's Annual Meeting held in Boston, USA.

<http://www.sci-com.eu/main/docs/Brussels-Declaration.pdf>.

Gurzawska, A. & Bencin, R. 2015. Ethical Assessment in Different Fields: Social Sciences.

<http://satoriproject.eu/media/2.d-Social-Sciences.pdf>, accessed on 08/09/2017.

King Abdulaziz City for Science and Technology. 2017. ضوابط الأمانة العلمية (Scientific Integrity Controls).

https://grants.kacst.edu.sa/Docs/STU_Proposal_Agreement.pdf (in Arabic)

Lebanese National Council for Scientific Research. 2016. The Charter of Ethics and Guiding Principles of Scientific Research in Lebanon.

http://www.cnrs.edu.lb/Library/Files/Uploaded%20Files/Charter_of_Ethics_En.pdf.

Ministry of Health in Sudan, Directorate of Research. 2008. Sudanese Guidelines for Ethical Conduct of Research Involving Human Subjects.
<http://snrec.sd/wp-content/uploads/2017/05/Sudan-National-Ethics-Guidelines.pdf>.

Ministry of Scientific Research in Egypt, Academy of Scientific Research and Technology. 2017. خارطة طريق العلم والتكنولوجيا من أجل التنمية: البعد الأخلاقي (Science and Technology Roadmap for Development: The Ethical Dimension of National Projects). (in Arabic)

National Association for Science Writers. 2014. Code of Ethics for Science Writers.
<https://www.nasw.org/code-ethics-science-writers>.

National Research Council Canada. 2017. Advisory Statement on Human Ethics in Artificial Intelligence and Big Data Research.
<https://nrc.canada.ca/en/corporate/values-ethics/research-involving-human-participants/advisory-statement-human-ethics-artificial-intelligence-big-data-research-2017>.

Qatar Supreme Council of Health (n.d.). Policies, Regulations and Guidelines for Research Involving Human Subjects.
<https://www.moph.gov.qa/about-us/Documents/research/Policies,%20Regulations%20and%20Guidelines%20for%20Research%20Involving%20Human.pdf>.

Shami, S. 2017. مبادئ وأخلاقيات البحث العلمي في العلوم الاجتماعية: حالة العالم العربي (Principles and Ethics of Scientific Research in Social Sciences: The Case of the Arab World), presentation during the "Regional Consultation on the Ethics of Scientific Research and Technology Applications in the Arab Region" (Beirut, 11-12 July 2017). (in Arabic)

Singapore Statement on Research Integrity. 2010. Document prepared for the 2nd World Conference on Research Integrity (Singapore, 21-24 July 2010).
<https://wcrif.org/guidance/singapore-statement>.

UNESCO, 2011. Code of Ethics for the Information Society Proposed by the Intergovernmental Council of the Information for All Program.
<http://unesdoc.unesco.org/images/0021/002126/212696e.pdf>.

UNESCO, 2017. Recommendation on Science and Scientific Researchers.
<https://unesdoc.unesco.org/ark:/48223/pf0000263618>.

United Nations Development Program & Mohammed bin Rashid Al Maktoum Knowledge Foundation, 2009. Arab Knowledge Report 2009: Towards Productive Intercommunication for Knowledge. Dar Al Ghurair Printing & Publishing, Dubai: United Arab Emirates.

United Nations Development Program & Mohammed bin Rashid Al Maktoum Knowledge Foundation, 2014. Arab Knowledge Report 2014: Youth and Knowledge Localization. Dar Al Ghurair Printing & Publishing, Dubai: United Arab Emirates.

Annex

The Charter of Ethics of Science and Technology in the Arab Region

The Council of the League of Arab States at the Summit Level,

- Having reviewed:

- The note submitted by the Secretariat,
- The report submitted by the Secretary-General on the joint Arab economic and social action,
- The recommendations of the Fourth meeting of the Technical Intellectual Property Committee held at the Secretariat on 13-14 February 2019,
- The "Charter of Ethics of Science and Technology in the Arab Region",
- The outcomes of the Economic and Social Council preparatory meetings prior to the Summit,

- **Having been briefed by the Secretariat,**

- **In light of the deliberations,**

1- Approves the Charter of Ethic of Science and Technology in the Arab Region as per the enclosed document [R30/(19/03)/17- R U(0178)], which serves as a guiding framework for the Arab States;

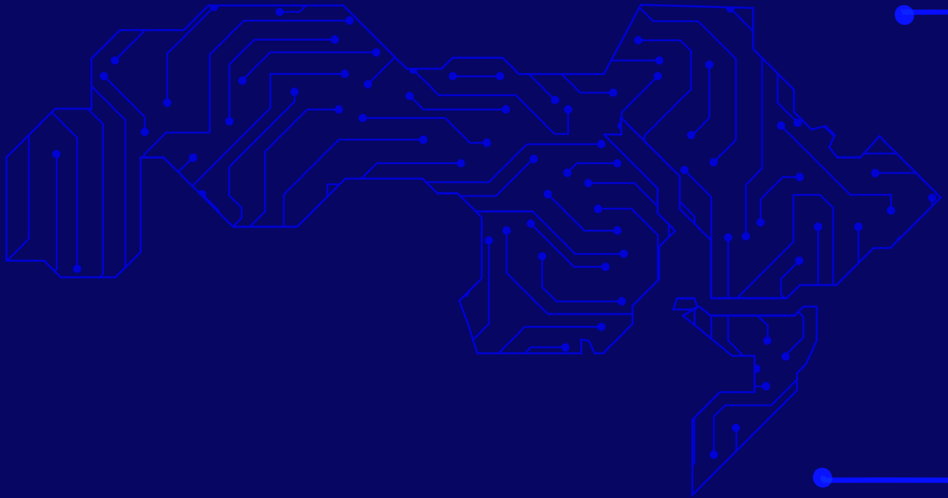
2- Calls on the Member States to disseminate the Charter principles among research institutions thereof.

(S.R. 772 O.S. (30) - S 3 - 31/03/2019)

Science and technology are foundations of sustainable human development. The Arab region faces accumulated and complex human development challenges that require the urgent and effective intervention of science in dealing with them. In light of the wide scientific and technological gap facing the region, the Charter of Ethics of Science and Technology in the Arab Region provides an umbrella ethical instrument that frames science and technology activities in the Arab region; supports an enabling environment where science and technology can thrive; protects science and technology workers and outcomes; and guides science and technology activities away from non-ethical practices that could harm the individual, society, or the environment.

The Charter is the fruit of an 18-months multi-stakeholder wide consultation process in the Arab region coordinated by the UNESCO Regional Bureau for Science in the Arab Region based in Cairo, in collaboration with the League of Arab States and several partnering regional entities. More than 500 participants from most Arab countries provided their inputs into the document.

On 31 March 2019, the Council of the League of Arab States at the Summit Level adopted a resolution that approves the Charter as a guidance document, calling on Arab States to disseminate it widely among their research institutions.



العلم

