

Citizen Science in Switzerland: Taking Stock and Ways into the Future

A Report from the Swiss Expert Group
for Citizen Science

About this Publication

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Preface

By Yves Flückiger,
President of the Swiss Academies
of Arts and Sciences

The COVID-19 pandemic thrust science into the spotlight like never before. In the face of this global crisis, science emerged as our guiding light, enabling societies worldwide to confront and navigate through unprecedented challenges. It is thanks to the relentless pursuit of knowledge, investment in basic research, international collaboration, and the data exchange made possible by the open science movement as well as the unwavering dedication of the scientific community that we have seen remarkable achievements, including the development of vaccines in record time. These accomplishments were only possible thanks to the commitment of healthcare professionals and the crucial engagement of the public, especially patient advocates and clinical trials participants, both healthy and sick.

The speed at which treatments were developed serves as a testament to the power of science. Researchers from diverse backgrounds rallied together, often redirecting their efforts to contribute solutions to the pressing needs of the world. This collective endeavour underscores the vital role of science as a force for progress and resilience in times of crisis. However, amidst this triumph, we cannot overlook the fact that there is a growing polarisation in people's attitude towards science, manifested, for example, in anti-vaccine movements. This development highlights the importance of carefully cultivating trust in science. As we navigate the complexities of our post-pandemic world, it is imperative that we reaffirm our commitment to science and its principles. By embracing openness and transparency in research practices, upholding ethical standards and inclusivity, and enhancing scientific communication, we can pave the way for a future where science serves as a beacon of hope, progress, and trust for generations to come.

In this endeavour, citizen science (CS) emerges as a crucial asset. By actively engaging the public in scientific undertakings, CS not only democratises the research process but also fosters greater trust and understanding between scientists and society. Moreover, empowering individuals to participate in scientific discovery both enriches our collective knowledge and reinforces the notion that science is a collaborative endeavour for the betterment of all.

Engaging with society is not just about the information that is shared – it is also about the active involvement of participants. Increasingly, citizens are posing questions, seeking answers, and expressing interest in contributing to university research activities. This eagerness spans from patient groups influencing medical research priorities to CS initiatives in which individuals collect vast amounts of data, showcasing their valuable contribution to scientific endeavours.

Over the past years, the open science movement has played a pivotal role in the effort to make science more accessible, particularly in Europe. However, its scope extends beyond mere communication. Policy directives, such as those from the European Union, ambitiously advocate for openness in data, source code, and educational resources. These rules are more important than ever, as we need to be very cautious about applying the principle of data sharing without limits and to bear in mind that it can also be the source of dual uses – as we have recently seen with the development of geo-surveillance software being used not only for conservation but also for military purposes.

At the heart of this movement is the burgeoning involvement of citizens and organisations in shaping research agendas and becoming active participants in projects. This marks a significant departure from traditional one-way communication in research. It empowers society by allowing it to influence scientific activities, thereby legitimising public funding for research while fostering stronger ties between academia and the public. Indeed, the increasing involvement of citizens signals the demise of the conventional ivory tower paradigm.

Realising the full potential of citizen participation requires careful consideration of effective strategies and the provision of adequate resources and frameworks for academia, NGOs, and other institutions that do CS. While some best practices in CS are already established, their implementation should not rely solely on enthusiastic individuals. Leaders of such research institutions need to champion these initiatives, devise supportive structures, and incentivise staff involvement, perhaps by allocating time and even bonuses for proactive engagement.

Citizen science stands as a beacon of innovation and collaboration within the scientific community, offering a promising pathway towards the democratisation and legitimisation of knowledge production. As one of the many participatory approaches emerging in research, its significance cannot be overstated, as it serves both scientific and societal imperatives. A key aspect of CS's multifaceted potential is its role in fostering dialogue between science and society, enhancing trust in scientific endeavours, and promoting scientific literacy.

At its core, CS embodies the spirit of inclusivity, inviting individuals from all walks of life to actively participate in the scientific process. This democratisation of science not only broadens the pool of contributors but also diversifies the perspectives and insights brought to bear on complex research questions. Through collaborative efforts, CS has the capacity to generate knowledge that may otherwise remain elusive and to tap into the collective wisdom of communities to address pressing challenges.

The Swiss Academies of Arts and Sciences have long recognised the importance of CS and have been actively engaged in fostering its growth and development within their own structures. From providing financial support for initiatives such as the Swiss CS platform and network *Schweiz forscht/Tous scientifiques*

to co-organising events like the European Citizen Science Association Conference in 2018 (ECSA 2018), the Academies have demonstrated their commitment to advancing the CS agenda. This commitment is further underscored by the Academies' inclusion of CS in their strategic multi-year planning and their continued support for key national conferences such as *CitSciHelvetia*.

This report represents yet another milestone in the Academies' ongoing efforts to promote and strengthen CS. Initiated, coordinated, and edited by *Science et Cité*, the Academies' competence centre for dialogue, this report serves as a testament to the vibrancy and dynamism of the CS landscape in Switzerland and beyond. Through its comprehensive analysis and strategic recommendations, it aims to galvanise further action and collaboration and chart a course towards a more inclusive and participatory scientific enterprise.

Indeed, while much progress has been made, ample opportunity remains to further foster CS in Switzerland. This report serves as a call to action, articulating clear goals and proposing actionable measures that can harness the full potential of CS to address the complex challenges of our time. By supporting citizen science, we reaffirm our collective commitment to a future in which science is not only accessible but actively shaped by the communities it serves.

Executive Summary

In recent years, the relationship between science and society has undergone a significant transformation, putting the dynamic field of citizen science into focus and allowing it to expand rapidly. In the citizen science approach, members of the general public (citizens) contribute to scientific knowledge production. People can engage in various stages of the research process, from problem formulation to data collection, analysis, and dissemination. Like other participatory approaches in science, citizen science aims to bring science and society closer together and often addresses concrete social or environmental problems.

Switzerland's citizen science landscape is exceptionally diverse and vibrant. Numerous institutions, organisations, and projects with different backgrounds, missions, competencies, and scopes exist. There are regional and national associations and organisations that carry out projects and exemplify how to do locally and socially grounded citizen science. In addition, Switzerland has academic centres that can serve as role models for the institutionalisation of citizen science in research institutions and that have international networks and reach. Although these complementary and diverse groups of actors are challenging to coordinate, they are also a great asset for citizen science in Switzerland. They reflect the country's federalism, which operates on the principles of consensus and subsidiarity. These Swiss advantages need to be strengthened and supported.

This report was commissioned by the Swiss Academies of Arts and Sciences (a+). Its mandate stems from a participatory process within a+ and the network Schweiz forscht/Tous scientifiques led by Science et Cité. This made it possible to bring representatives of citizen science stakeholder groups with different perspectives to the table to reflect together on how to strengthen citizen science in Switzerland. Using a collaborative approach that embraced their richness of views, the project's expert group agreed to focus on four thematic fields in which they saw a need for action.

The report's introduction provides additional details and context on the concept of citizen science and presents the most important actors that promote, support, implement, and/or realise citizen science projects in Switzerland. Each of the subsequent chapters identifies action points and defines goals and measures to further foster citizen science in Switzerland that are related to

the chapter's topic. These measures are aimed at citizen science practitioners, higher education institutions, non-academic institutions, ad hoc working groups, coordination points, and funding agencies. The report's conclusion provides an overview of all the goals and measures by categorising them according to the corresponding groups of actors.

Added Value and Impact

Citizen science provides invaluable benefits across multiple fronts. Science benefits from access to knowledge and experiences that are otherwise unavailable. In addition, citizen science enables data to be collected and validated on a broader scale, thus leading to more robust and widely accepted results. Participants gain added value by experiencing science and learning something in the process. They attain a sense of empowerment and meaning by contributing to research and solving real-world problems while also pursuing their interests and concerns. Citizen science fosters dialogue between science and society. As a result, it can identify socially relevant research questions and address urgent issues through (often applied) research. Hence, citizen science promotes practical, open science principles that benefit society. In order to fully exploit its added value, citizen science needs to take an impact-oriented approach and measure the benefits it provides.

Funding

Like most research projects, citizen science initiatives rely heavily on external funding. Switzerland, however, lacks mid- and long-term funding programmes dedicated to citizen science. This is problematic because citizen science cannot compete equally with other kinds of projects. The decision to use the method usually has to be justified, and competent reviewers are rare. The co-creation aspect inherent to many citizen science projects makes applying for grants especially challenging because the co-creation process itself requires resources that are not available at the time of writing an application. Due to their focus on building community and trust, citizen science projects usually require longer development periods. Another challenge is that they often need additional resources for training, infrastructure, outreach, and communication. One possible solution for

these funding challenges is for practitioners is to seek funding from various sources (a list of possible sources is included in this report). On a more fundamental level, research assessments need to be adapted to account for the specific requirements of citizen science.

Training

The report's chapter on training addresses the often overlooked aspect of preparing researchers to carry out citizen science projects. While there is ample literature on citizen training, scant attention is given to equipping scientists with the skills required to prepare and run citizen science projects. Core competencies of citizen science need to be integrated into academic curricula to meet the growing demand for high-quality citizen science. The chapter on training presents a few inspiring examples as well as a list of online tools – and it calls for placing more emphasis on capacity building for researchers.

Communication and Visibility

Several national organisations in Switzerland have increasingly recognised the value of citizen science, thus heightening the attention and support given to the approach. This development has greatly increased the prominence of citizen science among these organisations' stakeholders. Significant potential interest also exists within the broader Swiss population, which could be tapped via different online and offline channels. However, not only do many citizen science projects lack the resources needed to communicate more, but academic priorities generally lie elsewhere. The chapter on communication and visibility presents a list of tools for science communication as well as best practice examples of projects that have demonstrated good communication. Communication efforts need to be expanded and intensified in order to increase citizen science's visibility and reach an even wider audience.

Most Pertinent Measures to Foster Citizen Science in Switzerland

The following five measures appear in at least three of the four chapters and can thus be considered the most important measures that can be taken to move citizen science in Switzerland forward.

- **Create more training opportunities** that develop competencies specific to citizen science, including impact planning and measurement, grant writing, and science communication.
- **Create and maintain long-term structures** for projects and personnel. To do this, research-related jobs need to be diversified to include, for instance, communicators and community managers.
- **Reconsider research assessments** so they take into account tasks and needs specific to citizen science, such as outreach, science communication, and community management.
- **Facilitate the involvement of citizens** and non-academic actors in all stages of research.
- **Cooperate** in these and other endeavours and coordinate them well to avoid fragmentation. This can be done, for example, by creating an “ambassador's network” for citizen science with representatives from important and interested institutions.

Promising initiatives related to these measures already exist, for example the tailored training and implementation platforms that Citizen Science Zurich provides, the science mediation centers in Lausanne and Geneva that provide long-term structures, the Coalition for Advancing Research Assessment (CoARA) that provides alternative metrics for granting research money, Horizon 2020 that provides non-academic actors the opportunity to apply for grants, the citizen science Global Partnership in international Geneva that provides leverage for citizen science initiatives with the UN, and Schweiz forscht – tous scientifiques that provides a network and platform for citizen science in Switzerland to foster mutual learning and collaboration. These initiatives show that it is important that research and funding institutions establish citizen science on a strategic level. An important next step to realising the above-mentioned measures is to make even more visible what is already there: institutions, initiatives, tools and – most importantly – the diverse palette of citizen science projects.

Zusammenfassung

In den letzten Jahren hat sich das Verhältnis zwischen Wissenschaft und Gesellschaft stark verändert. So ist Citizen Science in den Fokus gerückt und konnte sich dynamisch entwickeln und ausbreiten. Beim Citizen-Science-Ansatz trägt die Bevölkerung (Citizens) zu wissenschaftlichem Erkenntnisgewinn bei. Interessierte Personen können in verschiedenen Phasen des Forschungsprozesses mitmachen: von der Problemformulierung über die Datenerfassung- und -analyse bis hin zur Verbreitung der Ergebnisse. Wie andere partizipative wissenschaftliche Ansätze zielt auch Citizen Science darauf ab, Wissenschaft und Gesellschaft einander näher zu bringen, und befasst sich häufig mit konkreten sozialen oder ökologischen Problemen.

Die Citizen-Science-Landschaft der Schweiz ist ausserordentlich vielfältig und lebendig. Es existieren zahlreiche Institutionen, Organisationen und Projekte mit unterschiedlichen Hintergründen, Aufträgen, Kompetenzen und Aufgabenbereichen. Regionale und nationale Verbände, Vereine und Organisationen führen Projekte durch und zeigen, wie Citizen Science lokal und gesellschaftlich verankert betrieben wird. Darüber hinaus gibt es in der Schweiz akademische Zentren, die als Vorbilder für die Institutionalisierung von Citizen Science in Forschungseinrichtungen dienen und die über internationale Netzwerke und Reichweite verfügen. Obwohl die Koordination dieser komplementären und vielfältigen Akteursgruppen eine Herausforderung darstellt, sind sie zugleich ein grosser Gewinn für Citizen Science in der Schweiz. Sie spiegeln den Föderalismus des Landes wider, der auf den Prinzipien des Konsenses und der Subsidiarität beruht. Diese Schweizer Vorzüge und Stärken müssen gestärkt und gefördert werden.

Der vorliegende Bericht wurde von den Akademien der Wissenschaften Schweiz (a+) in Auftrag gegeben. Das Mandat geht zurück auf einen partizipativen Prozess innerhalb von a+ und dem Netzwerk *Schweiz forscht* unter der Leitung von Science et Cité. Dies ermöglichte es, Citizen Science Stakeholder mit unterschiedlichen Perspektiven einzuladen, um gemeinsam darüber nachzudenken, wie Citizen Science in der Schweiz gestärkt werden kann. In einem kollaborativen Ansatz, welcher die vielfältigen Sichtweisen einbezog, einigte sich die Expert:innengruppe des Projekts auf vier Themenfelder, in denen sie Handlungsbedarf sah.

Die Einleitung des Berichts bietet weitere Details und Kontext zu Citizen Science und stellt die wichtigsten Akteure vor, welche Citizen-Science-Projekte in der Schweiz fördern, unterstützen, implementieren und/oder realisieren. Jedes der nachfolgenden Kapitel benennt Handlungsfelder und definiert dazugehörige Ziele und Massnahmen zur weiteren Stärkung von Citizen Science in der Schweiz. Die Massnahmen richten sich an Citizen-Science-Praktiker:innen, Hochschulen, nicht-akademische Institutionen, Ad-hoc-Arbeitsgruppen, Koordinationsstellen und Förderorganisationen. Der Bericht endet mit einer nach Akteursgruppe geordneten Übersicht zu allen Zielen und Massnahmen.

Mehrwert und Wirkung

Citizen Science ist in mehrfacher Hinsicht von unschätzbarem Wert. Für die Wissenschaften ergibt sich dadurch Zugang zu Wissen und Erfahrungen, die sonst nicht verfügbar sind. Darüber hinaus ermöglicht Citizen Science die Sammlung und Validierung von Daten in grösserem Umfang, was zu solideren und breiter akzeptierten Ergebnissen führt. Ein Mehrwert für die Teilnehmenden an Citizen-Science-Projekten besteht darin, dass sie Wissenschaft erleben und dabei etwas lernen. Ihr Beitrag zur Forschung und zur Lösung realer Probleme wirkt sinnstiftend und selbstermächtigend, während sie gleichzeitig ihren Interessen und Anliegen nachgehen können. Citizen Science fördert den Dialog zwischen Wissenschaft und Gesellschaft. Dadurch können gesellschaftlich relevante Forschungsfragen identifiziert und dringende Probleme durch (oft angewandte) Forschung angegangen werden. Citizen Science fördert also praktische und offene Wissenschaftsprinzipien, die der Gesellschaft zugutekommen. Um ihren Mehrwert voll ausschöpfen zu können, sollten Citizen-Science-Projekte einen wirkungsorientierten Ansatz verfolgen und ihren Nutzen evaluieren.

Finanzierung

Wie die meisten Forschungsprojekte sind auch Citizen-Science-Projekte in hohem Masse auf externe Finanzierung angewiesen. In der Schweiz fehlt es jedoch an mittel- und langfristigen Förderprogrammen spezifisch

für Citizen Science. Dies ist insofern problematisch, weil Citizen Science nicht gleichberechtigt mit anderen Forschungsprojekten konkurrieren kann. Die Anwendung von Citizen Science muss meist besser begründet werden, und kompetente Begutachtende sind rar. Viele Citizen-Science-Projekte setzen stark auf Mitgestaltung. Dieser Aspekt der Co-Kreation macht das Beantragen von Fördermitteln zu einer besonderen Herausforderung, weil der Mitgestaltungsprozess selbst Ressourcen erfordert, die zum Zeitpunkt der Antragstellung nicht verfügbar sind. Citizen-Science-Projekte benötigen in der Regel also eine längere Entwicklungsphase, da sie viel Zeit für Vertrauensaufbau und Community-Building benötigen. Eine weitere Herausforderung besteht darin, dass sie oft zusätzliche Ressourcen für Schulungen, Infrastruktur, Öffentlichkeitsarbeit und Kommunikation benötigen. Eine mögliche Lösung für diese Herausforderungen besteht darin, dass sich Praktiker:innen um Finanzmittel aus verschiedenen Quellen bemühen (eine Liste möglicher Stellen ist in diesem Bericht enthalten). Auf einer tiefergehenden Ebene müssen die Kriterien für Forschungsbewertungen angepasst werden, um den spezifischen Anforderungen von Citizen Science gerecht zu werden.

Ausbildung

Das Kapitel zum Thema Ausbildung (Training) befasst sich mit einem oft übersehenen Aspekt: der Schulung von Forschenden zur Durchführung von Citizen-Science-Projekten. Es gibt zwar viel Literatur über die Ausbildung von Teilnehmenden aus der Bevölkerung, aber es wird kaum darauf eingegangen, wie Wissenschaftler:innen die Kompetenzen erwerben können, die für Vorbereitung und Durchführung von Citizen-Science-Projekten erforderlich sind. Kernkompetenzen für Citizen Science sollen in akademische Lehrpläne integriert werden, um der wachsenden Nachfrage nach guter Citizen Science gerecht zu werden. Das Kapitel über Ausbildung stellt einige inspirierende Beispiele sowie eine Liste von Online-Tools vor - und fordert, den Schwerpunkt stärker auf den Kapazitätsaufbau für Forschende zu legen.

Kommunikation und Sichtbarkeit

Mehrere nationale Organisationen in der Schweiz haben den Wert von Citizen Science inzwischen anerkannt und damit die Aufmerksamkeit und Unterstützung für den Ansatz erhöht. Dies hat bei den Stakeholdern den Bekanntheitsgrad und Stellenwert von Citizen Science stark erhöht. Auch in der breiter Schweizer Bevölkerung besteht ein grosses potenzielles Interesse, das über verschiedene Online- und Offline-Kanäle angesprochen werden kann. Allerdings fehlt es vielen Citizen-Science-Projekten nicht nur an den nötigen Ressourcen, um stärker zu kommunizieren, sondern die akademischen Prioritäten liegen im Allgemeinen woanders. Das Kapitel über Kommunikation und Sichtbarkeit enthält eine Liste von Tools zur Wissenschaftskommunikation sowie Best-Practice-Beispiele aus Projekten. Solche kommunikativen Aktivitäten sollten erweitert und intensiviert werden, um die Sichtbarkeit von Citizen Science weiter zu erhöhen und ein noch grösseres Publikum zu erreichen.

Die wichtigsten Massnahmen zur Stärkung von Citizen Science in der Schweiz

Die folgenden fünf Massnahmen finden sich in mindestens drei der vier Kapitel und können somit als die wichtigsten Massnahmen zur weiteren Entfaltung von Citizen Science in der Schweiz betrachtet werden.

- **Schaffung von Ausbildungsangeboten**, die Citizen-Science-spezifische Kompetenzen vermitteln, einschliesslich Wirkungsplanung und -messung, Ausarbeitung von Förderanträgen und Wissenschaftskommunikation.
- **Schaffung und Bewahrung langfristiger Strukturen** für Projekte und Personal. Dazu bedarf es einer Diversifizierung von Forschungsstellen, z. B. für Kommunikation und Community Management.
- **Überarbeitung der Kriterien für Forschungsbewertung**, um die spezifischen Aktivitäten und Anforderungen von Citizen Science zu berücksichtigen und zu würdigen, z. B. Öffentlichkeitsarbeit, Wissenschaftskommunikation und Community-Management.

- **Beteiligung von Citizens und nichtakademischen Akteuren** in allen Phasen der Forschung muss vereinfacht werden.
- **Kooperation bei diesen und anderen Vorhaben**, um eine Fragmentierung zu verhindern. Dies kann zum Beispiel durch die Schaffung eines «Botschafter:innen Netzwerks» für Citizen Science mit Vertretenen von wichtigen und interessierten Institutionen geschehen.

Es gibt bereits vielversprechende Initiativen zur Umsetzung dieser Massnahmen. Citizen Science Zürich bietet auf die Zielgruppe zugeschnittene Ausbildungsangebote und Umsetzungsplattformen an. Die Wissenschaftsvermittlungszentren der Universitäten Genf und Lausanne sichern langfristige Strukturen. Die Vereinbarung von CoARA (Coalition for Advancing Research

Assessment) schlägt alternative Kriterien für die Vergabe von Forschungsgeldern vor. Horizon 2020 erlaubt nicht-akademischen Akteuren, sich auf Fördermittel zu bewerben. Die Citizen Science Global Partnership verschafft Citizen-Science-Initiativen mehr Einfluss bei der UNO. Mit *Schweiz forscht* gibt es eine Plattform und ein Netzwerk, welche das gemeinsame Lernen und die Zusammenarbeit in der Schweiz fördern. Diese Beispiele verdeutlichen, dass es von zentraler Bedeutung ist, dass Forschungs- und Fördereinrichtungen Citizen Science auf einer strategischen Ebene verankern. Ein wichtiger nächster Schritt zur Umsetzung der oben genannten Massnahmen ist es, das Vorhandene noch sichtbarer zu machen: Institutionen, Initiativen, Instrumente und vor allem die vielfältige Palette an Citizen-Science-Projekten.

Synthèse

Au cours des dernières années, les relations entre la science et la société ont considérablement évolué, mettant en lumière le domaine dynamique de la Citizen Science et lui permettant de se développer rapidement. Cette approche permet au grand public, aux citoyen-ne-s, de contribuer activement à la production de connaissances, tout en suivant les principes de la recherche scientifique. Les citoyen-ne-s s'impliquent ainsi dans les différentes étapes du processus de recherche, qui vont de la formulation du problème à la collecte de données, en passant par l'analyse et le partage des résultats. Comme d'autres approches participatives, la Citizen Science aspire à rapprocher science et société, se préoccupant souvent de problèmes sociétaux ou environnementaux concrets.

Le panorama de la Citizen Science en Suisse est exceptionnellement diversifié et étendu. Il existe en effet un nombre important d'institutions, d'organisations et de projets, porteurs de missions et de compétences diverses, qui agissent dans des domaines spécifiques. En outre, la Suisse dispose de centres universitaires qui peuvent servir de modèles pour l'institutionnalisation de la science citoyenne dans les établissements de recherche et qui disposent de réseaux et d'une portée internationale. La complémentarité et la diversité des intervenant-e-s constituent bien sûr un défi pour une coordination réussie, mais sont avant tout un avantage majeur en Suisse. Ces forces reflètent en effet le fédéralisme suisse, qui fonctionne sur les principes du consensus et de la subsidiarité, et doivent être absolument renforcées et soutenues.

Le rapport présenté ici a été réalisé à la demande des Académies suisses des sciences (a+). Les bases du mandat ont été définies dans le cadre d'un processus participatif au sein d'a+ et du réseau Tous scientifiques, piloté par Science et Cité. Des représentant-e-s de la Citizen Science se sont ainsi réunis, partageant leurs expériences complémentaires, et réfléchissant ensemble à la manière de renforcer ce domaine en Suisse. Cette richesse de points de vue échangés a permis de définir collaborativement quatre champs d'action thématiques.

L'introduction du rapport précise et contextualise la notion de Citizen Science et présente les principaux intervenant-e-s qui promeuvent, soutiennent, mettent en œuvre et/ou réalisent des projets dans ce domaine en Suisse. Le rapport identifie ensuite, au fil des chapitres et pour chaque thème retenu, les besoins et les actions nécessaires, puis définit les objectifs et les mesures qui seront utiles pour développer la Citizen Science en Suisse. Ce document propose de bonnes pratiques, à destination des praticien-ne-s de la Citizen Science, des hautes écoles, des institutions non-académiques, des groupes de travail ad-hoc, des points de coordination, ainsi que des organismes de financement. Les conclusions présentent une vue d'ensemble des objectifs et des mesures pour chacun de ces groupes.

Valeur ajoutée et impact

Un projet Citizen Science offre des avantages inestimables sur de multiples fronts. D'un point de vue scientifique, cette démarche fournit en effet des connaissances et des expériences difficiles à obtenir autrement. Elle permet la collecte et la validation de données à large échelle, ce qui renforce la confirmation et l'acceptation des résultats. Les participant-e-s acquièrent également, au cours du processus, un ensemble d'expériences et de connaissances nouvelles dans le domaine scientifique. En collaborant ainsi à la recherche, ils contribuent activement à la résolution de questions concrètes, en lien avec la société. Leur démarche prend aussi du sens, car elle s'inscrit au plus près de leurs intérêts et de leurs préoccupations. La Citizen Science favorise ainsi le dialogue entre la science et la société. Elle permet en outre d'identifier des questions de recherche socialement pertinentes en abordant des problèmes urgents grâce à des méthodes de recherche appliquée. De plus, la Citizen Science met en valeur les principes pratiques de l'Open Science, au bénéfice de la société dans son ensemble. Cependant, pour que la Citizen Science déploie toute sa valeur ajoutée, elle doit être planifiée de manière à avoir un impact, qui pourra être finalement mesuré.

Le financement

Comme la plupart des projets de recherche, les initiatives de Citizen Science dépendent fortement des financements externes. Toutefois, la Suisse ne dispose pas d'un programme qui lui est dédié, que ce soit à moyen ou à long terme. Cette situation est problématique car les projets de Citizen Science se retrouvent alors en concurrence inégale avec d'autres projets. Il faut en effet expliciter la méthodologie utilisée, alors que les évaluateurs compétents dans ce domaine sont peu nombreux. La cocréation inhérente à de nombreux projets de Citizen Science complexifie également la recherche de fonds, car le processus lui-même nécessite des ressources qui ne sont pas disponibles au moment de la rédaction de la demande. Comme il faut réunir une communauté et instaurer un climat de confiance, les projets de Citizen Science impliquent généralement des périodes de développement plus longues. Une autre difficulté est que ces projets nécessitent souvent des ressources supplémentaires pour la formation, l'infrastructure, la sensibilisation ou la communication. Une solution consiste à trouver des fonds auprès de divers organismes, dont ce rapport fournit une liste. Il apparaît fondamental que les évaluations de la recherche soient repensées, afin de tenir compte des spécificités de la Citizen Science.

Formation

Ce chapitre du rapport aborde le thème de la formation nécessaire aux chercheurs qui souhaitent mener à bien des projets de Citizen Science. En effet, si une littérature abondante existe à propos de la formation des citoyen-ne-s, peu d'attention est accordée à l'acquisition par les scientifiques des compétences nécessaires à la préparation et à la mise en œuvre de tels projets. Il est nécessaire d'intégrer les compétences de base de la Citizen Science dans les programmes universitaires afin de répondre à la demande croissante d'une Citizen Science de haute qualité. Le chapitre présente quelques exemples, ainsi qu'une liste d'outils en ligne, tout en précisant qu'il faut impérativement renforcer la formation des chercheurs et des chercheuses.

Communication et visibilité

Plusieurs organisations nationales reconnaissent de plus en plus la valeur de la Citizen Science, ce qui a pour effet d'accroître l'attention et le soutien. Cela contribue grandement à accroître son importance et l'intérêt pour la Citizen Science parmi les parties prenantes. Pour atteindre un public plus large, les projets doivent aussi bénéficier d'une plus grande visibilité. Il existe un potentiel certain d'intérêt au sein de la population suisse, qui pourrait être sensibilisée à travers différents canaux de communication en ligne et hors ligne. Cependant, de nombreux projets ne disposent pas des ressources nécessaires pour accroître leur communication, et les priorités sont parfois différentes pour le monde académique. Ce chapitre présente non seulement une liste d'outils de communication scientifique, mais aussi des exemples de bonnes pratiques de projets qui réussissent leur communication.

Les mesures les plus pertinentes pour encourager la Citizen Science en Suisse

Les cinq mesures résumées ici apparaissent dans au moins trois des quatre chapitres et peuvent donc être considérées comme les plus importantes pour que la Citizen Science en Suisse fasse un nouveau pas en avant.

- **Mettre en place davantage d'offres de formation** pour transmettre les compétences spécifiques à la Citizen Science, telles que la planification et la mesure de l'impact, la rédaction des demandes de subvention et la communication scientifique.
- **Créer et soutenir des structures à long terme** pour encadrer les projets et le personnel. Dans ce but, les emplois liés à la recherche doivent être diversifiés pour inclure, par exemple, des responsables de communication et des gestionnaires de communautés.
- **Repenser la manière dont sont réalisées les évaluations de projets scientifiques**, afin de tenir compte des critères et des exigences propres à la Citizen Science, telles que la diffusion, la médiation scientifique et la gestion des communautés.

- **Faciliter la participation des citoyen-ne-s**, des intervenant-e-s non-académiques à toutes les étapes de la recherche.
- **Encourager la coopération** dans toutes les activités et bien les coordonner afin d'éviter la dispersion. Cela peut se faire, par exemple, par un « réseau d'ambassadeur/drice-s » de la Citizen Science avec les représentant-e-s des institutions importantes et impliquées.

Des démarches prometteuses ont déjà été entreprises en vue de l'adoption de ces mesures, par exemple les plateformes d'encadrement et de mise en œuvres spécifiques proposées par Citizen Science Zurich, les centres de médiation scientifique des universités de Lausanne et de Genève, qui fournissent des structures pérennes,

CoARA (Coalition for Advancing Research Assessment) qui propose des mesures alternatives pour l'octroi de fonds de recherche, Horizon 2020 qui offre aux intervenant-e-s non-académiques la possibilité de solliciter des subventions, le Citizen Science Global Partnership à Genève, qui fournit un levier pour les projets en sein de l'ONU, et Tous scientifiques, qui déploie un réseau et une plateforme pour la Citizen Science en Suisse afin de favoriser l'apprentissage mutuel et la collaboration. Ces initiatives montrent ainsi qu'il est important que les institutions de recherche et de financement établissent la Citizen Science à un niveau stratégique. Une prochaine étape importante pour la mise en œuvre des mesures mentionnées consiste à renforcer la visibilité du panorama actuel : les institutions, les initiatives, les outils et, surtout, la palette variée de projets de Citizen Science.

Sintesi

Negli ultimi anni, il rapporto tra scienza e società ha subito un'importante trasformazione. Ciò ha fatto luce sul campo dinamico della citizen science e lei ha permesso di espandersi rapidamente. In questo approccio di ricerca, i membri del grande pubblico (citizens) contribuiscono alla produzione di conoscenze scientifiche. Le persone possono interagire in diverse fasi del processo di ricerca: dalla formulazione del problema, alla raccolta di dati, fino all'analisi e alla divulgazione dei risultati. Come altri approcci partecipativi in ambito scientifico, anche la citizen science mira ad avvicinare tra di loro la scienza e la società e tratta spesso problemi sociali ed ambientali concreti.

Il panorama della citizen science in Svizzera è estremamente diversificato e ricco. Esistono numerose istituzioni, organizzazioni e progetti con diverse storie, missioni, competenze e scopi. Ci sono associazioni regionali e nazionali che realizzano progetti e che dimostrano come fare citizen science radicata a livello locale e sociale. Esistono centri accademici che possono fungere da modello per l'istituzionalizzazione della citizen science negli istituti di ricerca e che dispongono di una rete di collaborazioni internazionali e di prestigio. Questa complementarità e diversità di attori rappresenta una sfida a livello di coordinamento, ma allo stesso tempo è una grande risorsa per la citizen science in Svizzera. Ciò rispecchia il federalismo del paese, che opera sui principi del consenso e della sussidiarietà. Questi vantaggi svizzeri devono essere ulteriormente rafforzati e sostenuti.

Questo rapporto è stato commissionato dalle Accademie svizzere delle scienze (a+). Le basi per questo mandato sono state sviluppate in un processo partecipativo all'interno di a+ e della rete Schweiz forscht/Tous scientifiques guidata da Science et Cité. Ciò ha permesso di riunire attorno al tavolo i rappresentanti dei diversi operatori nel campo della citizen science, che hanno portato le loro numerose prospettive e riflettuto su come rafforzare ulteriormente questo campo in Svizzera. Cogliendo questa varietà di punti di vista, sono stati concordati in modo collaborativo quattro ambiti d'azione tematici.

L'introduzione di questo rapporto specifica e contestualizza ulteriormente la nozione di citizen science e presenta gli attori più importanti che promuovono, sostengono, implementano e/o realizzano progetti di citizen science in Svizzera. In ciascuno dei suoi capitoli, il rapporto identifica le necessità di intervento e definisce sia gli obiettivi che le misure per promuovere ulteriormente la citizen science in Svizzera rispetto all'ambito del capitolo. Il rapporto suggerisce misure per gli operatori di citizen science, per le scuole universitarie, le istituzioni non accademiche, i gruppi di lavoro ad hoc, i punti di coordinamento e le istituzioni finanziatrici. Per una visione generale di tutti gli obiettivi e le misure per ciascun gruppo di attori, si vedano la conclusione.

Valore aggiunto e impatto

La citizen science fornisce benefici inestimabili su più fronti. Per la scienza, offre conoscenze ed esperienze altrimenti non disponibili, permettendo di raccogliere e convalidare dati su una scala più ampia, portando a risultati più solidi e ampiamente accettati. I partecipanti beneficiano invece del valore aggiunto di vivere la scienza e al contempo di imparare qualcosa. I cittadini percepiscono un senso di responsabilità e sentono di fare qualcosa di significativo contribuendo alla ricerca e risolvendo problemi reali, mentre possono seguire i loro interessi e preoccupazioni. La citizen science promuove il dialogo tra scienza e società. In questo modo, si possono identificare delle domande di ricerca, che hanno rilevanza sociale, affrontando questioni urgenti attraverso una ricerca spesso applicata. La citizen science promuove dunque i principi pratici della scienza aperta (open science) a beneficio della società. Affinché la citizen science possa esprimere tutto il suo valore aggiunto, è necessario pianificare in modo orientato all'impatto e misurarla.

Finanziamento

Come la maggior parte dei progetti di ricerca, le iniziative di citizen science dipendono fortemente da finanziamenti esterni. In Svizzera, tuttavia, manca un programma a medio-lungo termine dedicato a questo scopo. Questo è un problema perché la citizen science si trova in concorrenza impari con altri tipi di progetti. Normalmente è necessario giustificare l'uso di questo metodo e il numero di revisori competenti è molto limitato. La co-creazione, intrinseca di molti progetti di citizen science, rende le richieste di sovvenzioni particolarmente ardue, perché il processo stesso di co-creazione necessita di risorse non ancora disponibili durante la stesura della richiesta. A causa della necessità di costruire una comunità e di creare un rapporto di fiducia, i progetti di citizen science di solito richiedono dei periodi di sviluppo più lunghi. Un'altra sfida è rappresentata dal fatto che si necessitano risorse aggiuntive per la formazione, le infrastrutture, la promozione, o la comunicazione. Una soluzione per i professionisti è di trovare fondi da altre fonti. Questo rapporto ne fornisce un elenco. Fondamentalmente, le valutazioni della ricerca devono essere riformate per tenere conto delle specificità della citizen science.

Formazione

Questo capitolo tratta un aspetto trascurato: la formazione di ricercatori per progetti di citizen science. Sebbene ci sia un'ampia letteratura sulla formazione del cittadino, scarsa attenzione è data al fornire agli scienziati le competenze necessarie per preparare e condurre progetti di citizen science. È necessario integrare le competenze chiave della citizen science nei curricula accademici per soddisfare la crescente domanda di citizen science di alta qualità. Il capitolo presenta alcuni stimolanti esempi, nonché un elenco di strumenti online, ma invita anche a porre maggiore enfasi sullo sviluppo delle capacità dei ricercatori.

Comunicazione e visibilità

Diverse organizzazioni nazionali in Svizzera hanno riconosciuto sempre più il valore della citizen science, portando ad una maggiore attenzione e supporto al tema. Questo sviluppo aiuta notevolmente a mettere in risalto la citizen science tra i diversi stakeholders. Per raggiungere un pubblico più ampio è fondamentale una maggiore visibilità dei progetti. Esiste un grande potenziale di interesse tra la popolazione svizzera, che potrebbe essere raggiunta attraverso diversi canali online e offline. Tuttavia, a molti progetti mancano le risorse necessarie per comunicare di più. Inoltre, le priorità accademiche sono altre. Questo capitolo presenta una lista di strumenti per la comunicazione scientifica e una lista di buone pratiche con esempi di progetti che comunicano bene.

Le misure più pertinenti per promuovere la citizen science in Svizzera

Le seguenti cinque misure compaiono in almeno tre dei quattro capitoli e possono quindi essere considerate le più importanti affinché la citizen science in Svizzera faccia un ulteriore passo avanti.

- **Creare un maggior numero di offerte formative** che riguardano le competenze specifiche della citizen science, tra cui la pianificazione e la misurazione dell'impatto, la stesura di richieste di sovvenzione e la comunicazione scientifica.
- **Creare e mantenere strutture a lungo termine** per i progetti e il personale. A tal fine, i posti di lavoro legati alla ricerca devono essere diversificati per includere, ad esempio, comunicatori e community managers.
- **Riesaminare le valutazioni della ricerca** per tener conto dei compiti e delle esigenze specifiche della citizen science, come la promozione, la comunicazione scientifica e la gestione della comunità.

- **Facilitare il coinvolgimento del grande pubblico** e degli attori non accademici in tutte le fasi della ricerca.
- **Cooperare** in queste e altre imprese e coordinarle bene per evitare frammentazioni. Questo può essere fatto, per esempio, attraverso una “rete di ambasciatori” della citizen science con rappresentanti di istituzioni importanti ed interessate.

Passi promettenti verso queste misure esistono già: ad esempio, le piattaforme create su misura per la formazione e l’implementazione fornite da Citizen Science Zurich, i centri di mediazione scientifica a Losanna e Ginevra che forniscono strutture a lungo termine, CoARA (Coalition for Advancing Research Assessment) che fornisce metriche alternative per l’assegnazione di fondi di

ricerca, Horizon 2020 che offre agli attori non accademici l’opportunità di richiedere sovvenzioni, la Citizen Science Global Partnership nell’internazionale Ginevra che dà voce alle iniziative di citizen science con le Nazioni Unite, e Schweiz forscht/Tous scientifiques che fornisce una rete e una piattaforma per la citizen science in Svizzera per promuovere l’apprendimento e la collaborazione reciproca. Queste iniziative dimostrano che è importante che le istituzioni di ricerca e di finanziamento istituiscano la citizen science a un livello strategico. Un importante passo successivo alla realizzazione delle misure sopra citate è quello di rendere ancora più visibile ciò che già esiste: istituzioni, iniziative, strumenti e, soprattutto, la variegata gamma di progetti di citizen science.

I Introduction

In recent years, the role of society in scientific research has undergone a significant transformation, allowing the dynamic field of citizen science to expand rapidly. This report analyses the status quo of citizen science in Switzerland with the aim of methodically promoting the approach on a national level. It identifies the citizen science community's challenges and needs in order to formulate goals and measures for making citizen science more visible and effective and to systematically develop it further.

This report was commissioned by the Swiss Academies of Arts and Sciences (a+) in December 2021. The mandate stemmed from a participatory process within a+ and the network Schweiz forscht/Tous scientifiques led by Science et Cité. During this process, it became clear that a detailed and systematic outline of citizen science in Switzerland was needed. In fact, no overview of the numerous citizen science activities, training opportunities, or guidelines existed at the time. Acknowledging the growing importance and recognition of participatory research, the Swiss Academies of Arts and Sciences provided the resources to compile this report to fill that gap. In order to compile this report in a participatory manner and to include various perspectives, Science et Cité created an expert group to author it (see Annex for details). Moreover, a participatory approach was used in order to reduce the fragmentation of the Swiss citizen science landscape. The process brought together important stakeholders in the field of citizen science and has thus promoted discussions and mutual learning among various institutions.

After clarifying a common understanding of citizen science and presenting various citizen science actors in Switzerland, this report provides an in-depth discussion of the status quo of citizen science in Switzerland with respect to four important topics: added value and impact, funding, training, and communication and visibility. Each chapter begins with a description of the current situation, followed by key aspects of the topic and goals that would further advance citizen science in Switzerland. Crucial to this undertaking, each chapter contains specific measures that support the goals and indicates which actors could implement each measure. See Section I.III for a presentation and definition of the

six different groups of actors that are addressed and the Annex for methodological details on how the report was produced.

I.1 What is Citizen Science?

I.1.1 Common Understanding of Citizen Science

The term citizen science was first coined in the mid-1990s and had two distinct meanings. On the one hand, the sociologist Alan Irwin used it to draw attention to the fact that people from outside academia – citizens – could also generate valid scientific knowledge and to ask for a more “democratic” science that considers the concerns of citizens.¹ On the other hand, the ornithologist Rick Bonney used the term to describe citizens' voluntary data contribution to scientific projects and saw it as a tool for improving public understanding of science.²

Different Roots of Citizen Science

Practices that resemble today's citizen science can be traced back at least to the 19th century. It was a time of scientific professionalisation, when amateur naturalists pursued scientific endeavours outside of academic institutions. Other roots more directly connected to the current practice of citizen science are the radical science movements of the 1960s and 1970s. At that time, concerned scientists criticised academic science for serving the “military-industrial complex” rather than the people. Around the same time, people outside academia started gaining more knowledge about their bodies, health conditions (for example women's health movements and mental health issues), and their (toxic) environments. Such activities continued into the 1980s, for example in connection to HIV. At the same time, many scientific disciplines went through a “participatory turn” with “public engagement” being put forward by government bodies and international organisations.³

It is exceedingly difficult to define the term citizen science because any attempt is destined to fail to capture the full diversity of the various practices it encompasses. Nevertheless, countless authors and institutions have attempted to provide a definition.⁴ *The Oxford*

¹ Irwin (1995).

² Bonney (1996).

³ Strasser et al. (2019).

⁴ Haklay et al. (2021) analyse 34 different definitions.

English Dictionary first recorded the term citizen science in 2014, defining it as “scientific work undertaken by members of the general public often in collaboration with or under the direction of professional scientists and scientific institutions”. This definition remains useful because it is short and yet very inclusive.

The expert group’s understanding of citizen science considers the following points: Participants in citizen science projects produce new knowledge while taking into account scientific principles. The production of knowledge distinguishes citizen science from other forms of participation (e.g. political decision-making) and from science communication or “*médiation scientifique*”. Members of the public may participate during different steps of the process, from formulating the problem and research questions to gathering data, doing analysis and valorisation, and disseminating research results. The inclusion of citizens (i.e. people who do not do research as a profession) distinguishes citizen science from “regular” research. Swiss stakeholders have formulated their understanding of the citizen science methodology in general and its fundamental and practical characteristics in → 10 *Swiss Citizen Science Principles* that are available in four languages and that can be used as guidelines. The European Citizen Science Association (ECSA) has compiled a set of characteristics to illustrate what citizen science means in practice.⁵

Citizen science projects are often categorised according to the level of public participation. In 2009, Bonney et al. distinguished between three types of projects: contributory (in which citizen scientists mainly collect data), collaborative (in which citizen scientists also analyse data, participate in the study design, and/or are involved in the dissemination of results), and co-created (in which citizen scientists are involved during the whole research process).⁶ This taxonomy remains the one most frequently used. Other categorisations put emphasis on the different activities that citizens carry out in a project. Strasser et al., for example, differentiate between sensing, computing, analysing, self-reporting, and making.⁷

There are many reasons for practicing citizen science. Involving citizens in the research process has the potential to open up science as well as increase scientific literacy and trust in science. In addition, citizen science can produce results that help to solve socially and environmentally relevant issues as well as address urgent problems. Citizens have specialised knowledge and experience that may not be available in academia, for example knowledge about their immediate environment, their own bodies, and personal experiences with disease or discrimination. By including citizens, research also takes place where academic agendas have blind spots. Integrating citizens’ perspectives, notions of relevance, and their values allows science to be co-shaped. In doing this, citizen science takes the social responsibility of research seriously and has the potential to increase the democratisation of science. Connected to these possibilities is the fact that citizen science can gather extensive and more representative databases by engaging large numbers of people; processes to do this have become simpler in recent years due to new technologies. It is thus scientifically attractive to work with citizen science as it may open up new data and perspectives.

The Institutionalisation of Citizen Science in Switzerland

The institutionalisation of citizen science in Switzerland first occurred in 2009 in Geneva, when the University of Geneva (UNIGE), the European Organization for Nuclear Research (CERN), and the United Nations Institute for Training and Research (UNITAR) established the Citizen Cyberlab (CCL).⁸ With projects that are international in scope, CCL studies and develops new forms of public participation in research by initiating projects and organising events that “encourage citizens and scientists to collaborate in new ways to solve big challenges”.⁹ Today, CCL is part of the SDG Solution Space that is managed by the University of Geneva and hosts comprehensive education, innovation, and research programmes on the UN’s Sustainable Development Goals (SDGs).

⁵ Haklay et al. (2020). The ECSA also has endorsed a set of concrete criteria. See Dörler et al. (2022).

⁶ Bonney et al. (2009).

⁷ Strasser et al. (2019).

⁸ The initiative was based on the LHC@home project, which was launched in 2004 and describes itself as a “volunteer computing project that uses Internet-connected computers to advance Particle and Accelerator Physics”.

⁹ <https://sdgsolutionspace.org/citizen-cyberlab/>

The first documentation of national citizen science projects was done by Science et Cité in a report from 2014.¹⁰ Most of those projects had been launched only a few years earlier. Even before that, initiatives of the national data centres affiliated with InfoSpecies, a national platform for coordinating observations of and measurements on plants and animals, had had citizen science projects (though they were not labelled as such), for example the Swiss Ornithological Institute since the 1960s and info fauna, formerly the Centre Suisse de Cartographie de la Faune (CSCF), since the 1990s. The report also identified needs and gaps. In addition, it led to the establishment of the Swiss Citizen Science Network and the platform Schweiz forscht/Tous scientifiques in 2015, only one year after the European Citizen Science Association (ECSA) was founded.

The Swiss Science and Innovation Council (SSIC, now the Swiss Science Council (SSC)) commissioned an exploratory study on citizen science in 2017 and a dedicated political analysis with recommendations one year later.¹¹ The University of Zurich (UZH) and the Swiss Federal Institute of Technology (ETH) Zurich established the Competence Center – Citizen Science (CC-CS) in 2017 and the Participatory Science Academy (PWA) in 2018, which was made possible by the Mercator foundation in Switzerland. The two institutions merged in 2023 and became Citizen Science Zurich. In 2018, Science et Cité organised the second ECSA conference in Geneva with the local support of the University of Geneva. In 2021, CC-CS and PWA partnered with Science et Cité and Bioscope at the University of Geneva to hold CitSciHelvetia, the first national online conference on citizen science. Science et Cité organised the second CitSciHelvetia conference in Solothurn in 2023. A memorandum of understanding now exists that defines the framework for subsequent conferences and their organisers. The next CitSciHelvetia will take place in Lausanne in June 2025 and will be organised by Collaboratory, the participatory and collaborative action research unit at the University of Lausanne (UNIL).

The Swiss Academies of Arts and Sciences launched the Citizen Science Initiative of the Swiss Academies (ICSA+) in 2021, which is led by Science et Cité. This initiative made not only this report possible but also the compilation of 10 Swiss Citizen Science Principles. These principles are intended to serve as a common guideline for all stakeholders. They were drafted by the Swiss Academies of Arts and Sciences, Science et Cité, the Participatory Science Academy and the Competence Center – Citizen Science in Zurich, and the Citizen Cyberlab

in Geneva. Online feedback from the broader citizen science community was taken into consideration when drafting the guidelines.

I.I.II Link to Other Participatory Approaches

Citizen science focuses on public participation and scientific knowledge production. There are several other participatory approaches in science that share several important characteristics with citizen science and yet differ in some ways. → [Transdisciplinary research](#), → [transformative science](#), → [action research](#), → [community-based participatory research](#), and → [responsible research and innovation](#) are some of the approaches that can be subsumed under umbrella terms like “participatory research”, “co-productive research”, or “recherche partenariale”. This report refrains from defining these approaches because there is no clear consensus for each approach and because definitions may overlap and vary between different national or linguistic contexts.

All these approaches are united by their mission to bring science and society closer together. Motivated by the values of inclusion and empowerment, they seek to foster collaboration and co-production between scientists, communities, individuals, and stakeholders. One important goal these approaches share is capacity building, which empowers individuals and communities to actively contribute to scientific inquiry and decision-making processes.

These approaches also share important principles when it comes to research practices. Each approach fosters collaboration and participation in order to harness the power of collective efforts. Research of this kind highly values transparency: openness and clarity are paramount as they ensure that research processes and outcomes are traceable, accessible, and comprehensible to all parties involved. Most research projects promote a flat hierarchy to ensure equitable and respectful communication and to make sure that each participant’s unique perspective and contributions are valued. A final essential shared value is the appreciation of local and popular knowledge and expertise, which is often presented as the need to reduce epistemic injustice.¹²

¹⁰ Flück and Viviani (2014).

¹¹ Bendix (2017); Strasser and Haklay (2018).

¹² Kidd, Medina, and Pohlhaus (2017); Godrie et al. (2020).

All the approaches presented so far put a certain emphasis on problem-solving that addresses real-world challenges in diverse contexts. The degree to which this is emphasised by the different approaches varies and may be least pronounced in citizen science with its many classification, monitoring, digitalisation, and transcription initiatives. There is, however, a growing effort among many citizen science projects to contribute to the UN Sustainable Development Goals, a trend that illustrates the citizen science community has diverse views on the issue.

Citizen Science and Open Science

Open science is an important development in science and science policy that affects citizen science practices in a crucial way and that citizen science has the potential to fundamentally shape. According to Switzerland's State Secretariat for Education, Research and Innovation, "Open science is an umbrella term for a number of initiatives that aim at making science more accessible. [...] It aims in particular to increase the impact, transparency and reproducibility of scientific research, and to do so in a sustainable way."¹³ For UNESCO, citizen science is an integral part of open science, and in the UNESCO Recommendation on Open Science, they claim that one of their areas of action is "enhancing the inclusion of citizen and participatory science as integral parts of open science policies and practices at the national, institutional and funder levels."¹⁴ Citizen science is also one of the eight ambitions of the → European Union's open science policy. In Switzerland, → swissuniversities' Open Science programme includes citizen science considerations, and the Swiss Academies of Arts and Sciences has included citizen science as a topic they want to strategically address within their focus on → digital society and open science in the coming years.

Open science has the potential to facilitate participation in scientific processes, and citizen science has the potential to facilitate the openness of scientific processes.¹⁵ They are thus complementary movements, each with the potential to benefit from approaches used by the other. For example, on the one hand, even though many citizen science projects aim to present results in an accessible and understandable manner, not all citizen science projects publish open access or make their research data open (often due to practical restrictions, e.g. re-

garding repositories). In this respect, citizen science can benefit from approaches used by open science – which often focuses on open research data and open access – and increase its efforts to make the output of science open. On the other hand, even though up-to-date open science principles include open research processes in theory (e.g. open methodology), open science can aim to more broadly open up the input and process of science in practice – as done by citizen science and other participatory approaches. By learning from each other's strengths and working together, the open science and citizen science communities can attain a more comprehensive version of open science, as defined by UNESCO.

I.I.III Citizen Science and Academia

Due to the experience of the expert group, this report mainly aims to analyse the kind of citizen science that is more directly connected to academia. Concerns exist within the Swiss citizen science community, however, that academia is beginning to dominate the discourse around citizen science and that citizen science may lose some of its essential qualities when it occurs within the academic context.¹⁶ This discussion is reminiscent of Peter Finke's distinction between "citizen science light", where the impulse comes from professional scientists who supervise a project, and "citizen science proper", which is not (necessarily) connected to scientific institutions and comes from within society, for example in the form of associations (such as historical societies and naturalist societies), NGOs, patient groups, or residents living near high-risk facilities.¹⁷ The expert group is convinced that both approaches are valid since citizen science flourishes wherever genuine scientific inquiry guided by rigorous standards prevails. There are also potential benefits for citizen science when it engages with and is practiced within academia. Such involvement can enhance its legitimacy within the academic science community. It may also induce academia to make significant changes that better accommodate citizen science, which in turn may benefit the entire academic system. Finally, including citizen science approaches in academic courses and work can prepare students to later engage in citizen science.

¹³ <https://www.sbfi.admin.ch/sbfi/en/home/ihe/higher-education/hoehschulpolitische-themen/open-science.html>

¹⁴ <https://unesdoc.unesco.org/ark:/48223/pf0000379949.locale=en>, p.22.

¹⁵ DITOs consortium (2017).

¹⁶ This was significant feedback obtained from a workshop held on 30 March 2023 at the CitSciHelvetia'23 conference in Solothurn. The workshop was held to give the Swiss citizen science community an opportunity to provide feedback on a draft of this report.

¹⁷ Finke (2014).

This report aims to bring together actors from both within academia and beyond by highlighting the value of citizen science as a form of participatory research that increases research's social relevance. Universities are beginning to conduct participatory research and to acknowledge its value. The expert group is convinced that researchers need to listen to a broader selection of people regarding which topics to research. The variety of citizen science projects carried out outside of academia can be seen by the examples in this report.

I.II Citizen Science in Switzerland: Institutions, Actors, and Projects

This section contains a selection of citizen science institutions in Switzerland. They either host concrete projects (often not explicitly referred to as citizen science projects), use similar research approaches, or offer research resources and support for citizen science. The following list aims to include many different actors and institutions representing a variety of places, people, and perspectives, but it is not exhaustive. The list's variety demonstrates a strength: it allows citizen science to reach a wide range of people and include a variety of perspectives. This list is also available online. If an initiative missing from the online list, please contact → [Schweiz forscht/Tous scientifiques](#).

How Many Citizen Science Projects Exist in Switzerland?

Determining the number of citizen science projects in Switzerland is difficult since no comprehensive registry exists. The project platform [Schweiz forscht/Tous scientifiques](#) lists 80–90 active projects and approximately 40 completed ones. It is difficult to obtain an exact count because some projects are listed only on the French site, others only on the German site, and some on both. Moreover, all projects are responsible for listing themselves, so the list is certainly not complete.

Another approach is to search Swiss National Science Foundation's (SNSF's) → [registry](#), where almost 50,000 projects have been registered since 1995, when the term "citizen science" was first used. A registry search for "citizen science" produced 73 projects, 21 of which ended before 2020. A search for "participatory" produced 345 projects, 146 of which ended before 2020. While these results may seem rather marginal, a very significant increase over the past few years can be

observed. Furthermore, the SNSF database only includes projects linked to a higher education institution. However, many citizen science projects are not linked to such institutions.

→ [The Office for Citizen Science in Switzerland](#) was founded in 2015 and is based at the Foundation Science et Cité, which is the competence centre for dialogue of the Swiss Academies of the Arts and Sciences. The office's main aim is to increase the recognition and visibility of citizen science in Switzerland, for example by publishing this report. It maintains the platform and network → [Schweiz forscht/Tous scientifiques](#), which promotes mutual learning and networking and makes citizen science activities in Switzerland visible. These activities include specific projects as well as training courses and publications.

→ [Citizen Cyberlab](#) was created in 2009 as a partnership between CERN, UNITAR, and the University of Geneva. It is a hub for innovative research participation methods and unites researchers from the fields of history, informatics, medicine, and more. Collaborative projects and events encourage cooperation between citizens and scientists. From online crowdsourcing to hackathons, Citizen Cyberlab explores the limits of citizen science. Most recently, it led the → [Crowd4SDG](#) project Citizen Science for Monitoring Climate Impacts and Achieving Climate Resilience.

→ [Citizen Science Zurich](#) was established in 2023 by merging the Participatory Science Academy (2018–2023) and the Competence Center – Citizen Science (2017–2023). It is a joint initiative by the University of Zurich and ETH Zurich and has been supported from the beginning by the Mercator foundation in Switzerland. Citizen Science Zurich provides training for citizen science skills as well as the resources, expertise, and technical know-how needed to develop, set up, and run citizen science projects.

→ [The ColLaboratory](#) is the collaborative and participatory action research unit at the University of Lausanne. Its goal is to integrate the needs, skills, and knowledge of societal actors into research activities in order to promote social innovation through research. Its areas of expertise include collaborative and participatory action research, citizen and patient participation in health and biomedical research, social studies of science and technology, and research ethics.

→ **Sciencescope** is the scientific mediation centre at the University of Geneva's Faculty of Science. It aims to awaken and cultivate an interest in science among the general public, particularly among young people. Some of its subdivisions, notably → **Bioscope** and → **Infoscope**, regularly carry out citizen science projects.

→ **L'éprouvette** is the Science and Society Laboratory at the University of Lausanne. It offers the canton of Vaud's citizens a wide range of educational and practical activities, including citizen science projects, in the humanities and social sciences as well as in environmental and life sciences. These activities provide unique opportunities to understand and experiment with the sciences and to discuss social issues in an environment of expertise and research.

→ **TdLab** at ETH Zurich fosters transdisciplinary research and education for sustainable development with an emphasis on collaboration with societal actors. Students learn about transdisciplinarity and explore methods and theories of knowledge co-production. TdLab encourages student initiative, real-world problem-solving, and stakeholder interaction by adopting a coaching approach.

→ **td-net** (Network for Transdisciplinary Research) supports the Swiss Academies of Arts and Sciences by promoting exchange and cooperation among disciplines and between science and society. In addition to addressing the concerns of researchers and research funders in the field of inter- and transdisciplinary research and teaching through a platform of mutual learning, the network aims to help develop a professional community. td-net unites expertise, methods, and tools for the co-production of knowledge.

Particularly in the field of medicine and health, many higher education institutions or their affiliated hospitals have set up centres for participatory research. The Bern University of Applied Sciences, for example, maintains the → **Competence Centre Participatory Health Care**. In the canton of Vaud, the La Source School of Nursing (HES-SO), the School of Engineering and Management (HEIG-VD), and the École cantonale d'art de Lausanne (ECAL/University of Art and Design Lausanne) maintain the → **senior-lab**. Around 200 seniors and 100 professionals work together in this open and interdisciplinary

living lab dedicated to seniors' quality of life. Seniors may engage in different stages of a project, from the initial stages (bottom-up) to later stages (analysis and co-creation). In addition to these institutions, the Swiss Clinical Trial Organisation offers a map of projects on → **patient and public involvement (PPI)**.

Citizen Science Abroad

In Europe, various umbrella organisations for citizen science have been established in recent years to provide national and transnational platforms and to foster networking.¹⁸ Schweiz forscht/Tous scientifiques and Citizen Science Zurich cooperate with → **Österreich forscht** from Austria, → **mit:forschen!** from Germany (until 2024 called **Bürger schaffen Wissen**), and other actors in the → **D-A-CH working group**. The working group's aims are to intensify cooperation among German-speaking countries, use common ground, exchange best practices, and establish short paths of (informal) exchange and mutual learning. Individuals and organisations from Switzerland also engage in the → **European Citizen Science Association (ECSA)**. By now, almost all continents have their own citizen science associations.¹⁹ There is also the → **Citizen Science Global Partnership (CSGP)**, a "network-of-networks that seeks to promote and advance citizen science for a sustainable world", funded and established by a network of existing national citizen science associations. The University of Geneva and Citizen Science Zurich played a critical role in establishing the CSGP partnership, and they jointly host its Swiss hub. The → **Global Science Forum** of the Organisation for Economic Co-operation and Development (OECD) has set up an expert group that is compiling a report on "Trust in Science and Citizen Science" to appear in autumn 2024. In 2019, the → **Austrian Center for Citizen Science**, based at Austria's federal Agency for Education and Internationalisation (OeAD), compiled a → **useful document** (in German) containing a detailed overview of national and international initiatives, networks, and platforms. In 2022, the white paper → **Citizen Science Strategy 2030 for Germany** was published after a broad participatory process. It formulates "action recommendations for Germany to strengthen Citizen Science by 2030 in order to unleash its innovative potential for science, society and politics".

¹⁸ For example the → **Sciences Citoyennes** association in France and → **L'Associazione italiana di citizen science** in Italy.

¹⁹ For example the → **CitSci Africa Association**, the → **CitizenScience.Asia**, the → **Australian Citizen Science Association**, and in North America the → **Association for Advancing Participatory Sciences** (until 2022 called **Citizen Science Association**).

Many institutions and initiatives outside higher education institutions practice citizen science, even if they are often not explicitly labelled as such. These places are extremely important for executing concrete projects. The following listing provides a clustered overview with examples of projects.

Federal offices, often in cooperation with partners, repeatedly call on the general public in order to gather data, finance, or carry out citizen science projects. The project → *Wilde Nachbarn/Nos voisins sauvages*, for example, receives substantial funding from the Federal Office for the Environment (FOEN). The FOEN also supports → *PhaenoNet*, the → *Schweizer Brutvogelatlas*, and the → *Atlas der Säugetiere Schweiz und Liechtenstein*. The Federal Office for Meteorology and Climatology takes a citizen science approach in its project → *Harnessing the power of Crowdsourcing for Mountain Monitoring*. It relies on public measurement in → *hail research*, which is conducted in cooperation with the → *Mobililar Lab for Natural Risks* at the University of Bern's Oeschger Centre for Climate Change Research.

Cantons and municipalities often support local and regional citizen science activities. For example, the town of Winterthur launched its → *Stadt-Thermometer* project to measure urban temperatures. The canton of Aargau's Department of Construction, Transport and Environment commissioned the → *Aufgabeln* project to study household food waste.

Libraries and archives are increasingly opening their collections to the public for volunteers to transcribe, geo-reference, tag, or digitise items. For the Zentralbibliothek Zürich, citizen science is of strategic importance in these endeavours.²⁰ The city and canton of Neuchâtel adopted a citizen science approach to shed light on the → *history of the public library* and town museums. Another platform maintained by HEIG-VD is → *Smapshot*, which aims at facilitating the localisation of historical photographs and is open to all archives.

Museums have also recognised the potential of citizen science to enrich their collections and exhibitions. In December 2023, the Swiss Museums Association published a brochure on the topic.²¹ The → *Regional Museum of the Lucerne Rigi Municipalities*, for example, used a citizen science approach in their exhibition on hydropower and also created an inventory of historical sites through the

project *Geschichten, die noch fehlen*. The Swiss Museum of Transport chose a citizen science approach for their project on the → *energy transition*.

Swiss parks and UNESCO heritage sites compiled a report on the status quo of citizen science in their sites that lists the countless projects that have already been completed.²² Like museums and similar institutions, Swiss parks can take an important intermediary function for facilitating citizen science because of their proximity and close contact with interested local inhabitants.

Countless **NGOs, foundations, and associations** as well as private and public organisations exist that focus on a specific topic. Many of them finance or carry out citizen science projects. The foundation FONSART (Fondation pour la sauvegarde et la mise valeur du patrimoine audiovisuel de la Radio Télévision Suisse) maintains the platforms → *notreHistoire.ch*, → *lanostraStoria.ch*, → *nossaIstorgia.ch*, and → *unsereGeschichte.ch* for participatory collections and the valorisation of audiovisual archives. → *BirdLife Switzerland's Stunde der Gartenvögel* initiative is a quintessential citizen science project. → *Pro Natura* regularly supports and carries out citizen science projects, usually in collaboration with partners. For example, it is carrying out a project on spring habitats together with the canton of Bern and UNA, a private atelier for environmental and conservation questions. In the area of biodiversity, several of the national data centres affiliated with → *InfoSpecies* (infoFlora, info fauna, Vogelwarte, etc.) carry out citizen science projects to collect species or organise mapping activities. In the French-speaking part of Switzerland, the → *Leenaards Foundation* plays an important role in supporting participatory research, especially in the domain of health. The Geneva-based NGO → *Objectif Sciences International* organises participatory science activities in the form of corporate incentives, school trips, and scientific holidays as well as expeditions, training opportunities, and science clubs.

→ *Wikimedia CH* has a GLAM (Galleries, Libraries, Archives, and Museums) programme that aims to “help Swiss memory institutions share their curatorial knowledge, collections and resources in a digital manner, on global platforms”. To assist in this endeavour, the platform offers events and tools (e.g. for statistics or geolocation), many of which aim to facilitate public participation.

²⁰ Wiederkehr (2022).

²¹ Viviani (2023).

²² Wiesli and Bär (2022).

→ **Swiss FabLabs** are part of a global network of labs that are open to everyone and enable invention by providing access to tools for digital fabrication. As a network, they offer operational, educational, technical, financial, and logistical assistance. Thus, they potentially assist citizen science projects.

Living labs (→ **Reallabore**, laboratoires vivants) are collaborative spaces where science and civil society stakeholders meet to exchange ideas and develop sustainable solutions, inspired by transdisciplinary and participatory research. Switzerland has countless living labs on a variety of topics, such as → **architecture**, → **music**, → **the energy transition**, → **regional development**, → **mobility**, and → **sustainability** in general. These labs are usually maintained as collaborations between higher education institutions, foundations, federal or municipal agencies, and other actors.

Private organisations also conduct citizen science. For example, → **catta** carries out projects in cooperation with partners such as municipalities, universities, and museums. It also provides conceptual and organisational support for citizen science and science communication in general.

For a **list of citizen science projects in Switzerland**, please visit the project platform of → **Schweiz forscht/Tous scientifiques**. It is worth noting that Swiss citizens can also participate in European (and global) projects. The → **eu-citizen.science** platform lists projects from Europe; the platforms → **SciStarter** and → **Zooniverse** have a global scope with numerous projects that offer online participation.

Ethical and Legal Questions

The global citizen science community recognises that ethical and legal questions have a significant impact on the execution of their projects, for example when it comes to gathering or publishing data. A considerable amount of literature and training is available on these issues, particularly at the European level.²³ In 2020, a report that contains guidelines for citizen science – and is also useful in other contexts – was compiled at the University of Zurich and ETH Zurich.²⁴ Moreover, many research institutions and professional associations already have ethical guidelines that are applicable to citizen science projects. The expert group recommends clarifying the current situation.

I.III Groups of Actors

Each chapter and the conclusion of this report contain tables listing concrete measures that could support specific goals to foster citizen science in Switzerland and specifying which actors could implement these measures. This report differentiates between the following six groups of actors. Please note that an individual or institution may have different roles and be part of more than one group, depending on the issue at hand.

- **Citizen science practitioners:** people who engage in citizen science, including both academic and citizen scientists
- **Funding agencies:** academic funding agencies (e.g. the Swiss National Science Foundation (SNSF)) as well as foundations and other institutions that grant research funds or support citizen science (e.g. federal, cantonal, and municipal institutions)
- **Higher education institutions (HEIs):** universities, universities of applied sciences, universities of teacher education, and other institutions in the higher education sector play a key role by training scientists and conducting a significant share of professional science
- **Non-academic institutions:** places and organisations in which citizen science projects take place but are not part of the higher education system; these could be federal, cantonal, or municipal departments, libraries and archives, museums, foundations, associations, private organisations, and so forth
- **Coordination points:** entities or people that maintain the overview of a specific issue that needs to be updated on a regular basis but does not require fresh conceptual work (e.g. administering websites or online living documents)
- **Ad hoc working groups:** fluid and open working groups that exist for a limited period of time, are set up for a specific issue of shared interest, and whose members are interested actors from citizen science institutions and practitioners. They collaborate to advance the topic at hand and to create a specific result, such as guidelines or roadmaps. The expert group for this report is an example of how such working groups could function.

²³ For an overview, see this → **workshop report** from the ECSA conference 2020 or this CSA → **webinar**.

²⁴ Jobin (2020).

1 Added Value and Impact

From the 10 Swiss Citizen Science Principles, principle 3 (added value) claims that “Citizen science projects provide an added value to both the citizen scientists and the academic scientists [a distinction that is not always so clear-cut]. This includes mutual learning opportunities between project team members (dialogue, societal exchange, organizational skills), capacity building, personal enrichment, satisfaction through contributing to scientific evidence.”²⁵ Such kinds of added value are imperative to all citizen science. According to the widespread IOOI (Input-Output-Outcome-Impact) logic model,²⁶ they are part of its outcomes and impact, which “refer to short-term and long-term changes resulting from citizen science initiatives”.²⁷

Most definitions distinguish between outcome and impact. According to the foundation → [Stiftung Mercator](#), for example, impact is the vision (of the project and its designers), in other words “the change that is desired in society or in the environment and to which the project contributes”. The outcomes, however, include “all the changes that the project can and should achieve”. Outcomes are concrete and specific for target groups and can be measured. In addition, outcomes are the direct effects (*Wirkungen*) of the outputs. These outputs include services, offerings, and products, for example printed materials or events.²⁸

1.1 Current Situation

Through its participatory features, citizen science encourages the interaction and collaboration between academic and citizen scientists and – depending on the project – also includes other actors, for instance civil society organisations or administrations. In this manner, citizen science can be a vehicle for democratising science and promoting the goal of universal and equitable access to scientific data and information.²⁹ Citizen science projects often explore topics that are not on the research agenda

or that could not be realised without the participation of citizen scientists. Numerous studies have proven and demonstrated such added value for science, society, and individuals at different levels.³⁰

1.1.1 Added Value of Citizen Science for Science

Citizen science can be adapted to and applied within diverse situations and practices in almost all scientific disciplines. Moreover, it is well suited for bringing together expertise from different fields. Citizen science offers unique possibilities for data collection and valorisation because it can potentially engage large numbers of collectors and evaluators from vast geographic areas (for example the projects → [Across Space and Time](#), → [CrowdWater](#), → [Mission Flora](#), → [PhaenoNet](#), and → [ornitho.ch](#)). By including local expertise and the everyday knowledge of citizen scientists, citizen science also offers the possibility to (co-)design projects that could not be performed without citizen input (for example the projects → [Val d'Hérens 1950–2050](#) and → [Älterwerden](#)). Therefore, citizen science has great potential to innovate study design by making it more nuanced and robust. The inclusion of more and unexpected perspectives as well as local knowledge can also result in more original research questions.³¹ In general, the dynamics of citizen science projects foster good open science practices. Transparency, trust, collaboration, and accessibility are crucial for citizen science projects, and they are key principles for innovating research practices more generally.³²

Apart from the added value that citizen science brings to research and knowledge production itself,³³ academics and citizen scientists conducting citizen science acquire important competencies.³⁴ While the learning effects for citizens in projects are frequently mentioned in research and literature, it must be highlighted that academic researchers also benefit from the skills acquired when practicing citizen science.³⁵ Social and organisational

²⁵ https://www.schweizforscht.ch/images/Swiss_CS_Principles/220317_Swiss_CS_Principles_final_Englisch.pdf

²⁶ Balthasar and Fässler (2017).

²⁷ Wehn et al. (2021).

²⁸ <https://projekte-mit-wirkung.ch/>

²⁹ de Sherbinin et al. (2021).

³⁰ Bonn et al. (2018); Lorke and Schmid-Loertzer (2022); Butkevičienė et al. (2021). For visualised syntheses see https://maritime-forum.ec.europa.eu/contents/citizen-science-importance-and-benefits_en or <https://www.mitforschen.org/citizen-science/handbuch/vorteile-herausforderungen>

³¹ See Chapter 5.3 in Strasser and Haklay (2018).

³² Bonn et al. (2018).

³³ Shirk and Bonney (2018).

³⁴ Höhener and Stämpfli (2022).

³⁵ Phillips et al. (2018); Kloetzer et al. (2021).

skills and communication know-how, for example, are useful while practicing various types of scientific and socially valuable activities.

Citizen science enables the social and practical relevance of scientific work to be examined by actively involving members of the public in the research process. They contribute their perspectives, expertise, needs, and local knowledge. This engagement ensures that scientific projects address real-world issues that resonate with the communities they affect. With such an inclusive design, citizen science can produce results that are not only scientifically robust but also widely accepted and valued by the public and politicians. While the degree of acceptance depends on the degree of involvement of non-academic actors and concerned communities and individuals, the whole process also needs to be accompanied by meaningful communication that includes everyone involved and by outreach activities tailored to different target groups.

Data Quality in Citizen Science

Citizen science projects consistently produce high-quality data on par with traditional scientific endeavours.³⁶ Maintaining high standards in citizen science is crucial to ensuring scientific rigor and credibility, and quality assurance mechanisms are central in this regard. Such mechanisms include not only data validation and consistency checks but also robust protocols, clear instructions, and proper training. In citizen science, data quality can also be crowdsourced to handle large data sets, and innovative approaches such as gamification are promising.³⁷ As with any scientific research, transparency in and about these methodologies fosters trust within and beyond the scientific community. In addition, open communication channels facilitate feedback and improvement. To these ends, various tools, checklists, and suggestions on data quality in citizen science exist.³⁸

1.1.2 Added Value of Citizen Science for Project Participants

Citizen scientists and academic scientists participate together in citizen science projects. These projects offer all participants hands-on science experience, providing not only new knowledge and learning opportunities but also a deeper and broader understanding of how science operates. Citizen science helps to strengthen several personal competencies, such as the capacity to work collaboratively as well as, depending on the project, social and communication skills. Citizen science can foster people's sense of legitimacy, empower them, and thus contribute to reducing epistemic injustice, especially when it involves excluded, vulnerable, and oppressed social groups.³⁹ Citizen science creates a sense of community and the belief that one can achieve more by working together. Furthermore, citizen science enables participants' knowledge to be acknowledged, valorised, and put to good use. The → [Long Covid Switzerland](#) association, for example, unites patient participants with epidemiologists and health experts to tackle patients' precarious health condition.⁴⁰ The → [Evermore](#) project researches the importance of spirituality in everyday life and allows users to be co-researchers in how they use a meditation app and then improve it according to their needs. The project → [Wilde Nachbarn](#) enables citizen scientists to explore the wildlife at their doorstep and create a new sense of connection with and responsibility for nature in their neighbourhoods.

In many respects, citizen scientists and academic scientists differ in the manner and content of what they learn from citizen science projects.⁴¹ However, many benefits that citizen and academic scientists look for are similar, such as acquiring knowledge, giving a larger meaning to research, meeting and learning from other people, and having fun.⁴²

³⁶ Balázs (2021); Kosmala et al. (2016). See also Chapter 5.1 in Strasser and Haklay (2018).

³⁷ Strobl et al. (2019).

³⁸ eu-citizen.science has a resource page on → [data quality and standards](#). See also Baker et al. (2021); Downs et al. (2021).

³⁹ Godrie and Dos Santos (2017).

⁴⁰ Ziegler et al. (2022).

⁴¹ Kloetzer et al. (2021).

⁴² Geoghegan et al. (2016); Peter et al. (2021). See also the → [miro board](#) from a Schweiz forscht/Tous scientifiques network meeting on 21 September 2022.

1.1.3 Added Value of Citizen Science for Society and Politics

By bringing science and society closer together, citizen science encourages greater trust and understanding between both parties. It thus makes it possible to set up scientific agendas aligned with societal changes and challenges, often contributing to the UN's Sustainable Development Goals.⁴³

Projects on environmental and health issues, in particular, produce knowledge that takes up participants' immediate concerns. These projects use a participatory approach to gather data, establish scientific evidence, raise awareness, and demonstrate the need to act. They thus aim to take measures to improve medical and environmental conditions as well as the overall quality of life (for example the → [Swiss Multiple Sclerosis Registry](#), → [CrowdWater](#), and → [3-2-1 heiss!](#) projects).

The citizen group → [Le Collège citoyen de co-chercheurs en matière de santé](#) from the ColLaboratory at the University of Lausanne intervenes as a "collective expert" in health research. Through such empowerment of concerned groups, citizen science democratises and produces knowledge that is socially and practically relevant, thus providing policymakers and civil society with knowledge that has a unique level of legitimacy. Therefore, citizen science also has the potential to be a version of open science that not only opens up research data and findings but also includes citizens in the formulation of questions and priorities, which may eventually lead to a fruitful dialogue between science and society.

Numerous citizen science projects in museums, libraries, and archives aim to bring communities together, strengthen them, and increase mutual understanding. For example, the project → [Geschichten, die noch fehlen](#) from the Regional Museum of the Lucerne Rigi Municipalities gives its community the possibility to tell their own history. It thus aims to make individuals and groups visible who have so far been underrepresented. → [The "Borys Malkin Collection" in the view of Wounaan in Columbia](#) project at the University of Zurich's Ethnographic Museum included members of the public in Switzerland and Columbia in the conception of the exhibition to collectively think about, among many other issues, what it means to maintain and display global museum collections in Switzerland. These examples illustrate how integrating individuals with diverse perspectives into research endeavours fosters novel viewpoints and insights.

1.1.4 Tools for Impact Assessment and Planning

The impact of citizen science projects is difficult to assess. This is also true for traditional research: impact factors or h-indexes for citations do not give any precise estimate or certainty concerning a project's effects on knowledge and society. Like other kinds of research, citizen science projects are diverse, and evaluations are very project- and context-dependent. Therefore, it is not possible to have a standardised evaluation methodology for all projects. However, because added value is a central feature of citizen science and other kinds of participatory and collaborative research, these types of projects are ideal spaces to explore new ways of assessing the impact and social relevance of research. Ideally, such a reformed impact assessment begins by clearly defining project goals through a logic model or similar schemes. It continues with seeing assessment as a continual, ongoing process – not just a post-project review. Findings should be implemented during the project to make improvements. In addition, it should be normal to involve project participants – and not just external reviewers – in the assessment process in order to gain a collective perspective. Such an approach ensures continual improvement and a more comprehensive, inclusive understanding of a project's impact. The list below contains several useful tools to measure and plan the impact of research projects in this manner, some of which are specifically tailored to citizen science.

Impact Assessment and Planning Tools

Citizen Science Zurich (CSZ):

→ [Impact-oriented Planning of Citizen Science Projects](#)

Horizon 2020, MICS:

→ [Measuring Impact of Citizen Science \(MICS\)](#)

Horizon 2020, CS Track:

→ [Assessing the impact of citizen science](#)

Impact Unit:

→ [Evaluationsplattform](#)

Mercator foundation:

→ [Projekte mit Wirkung](#)

PHINEO:

→ [Social Impact Navigator](#)

⁴³ Fritz et al. (2019); Fraisl et al. (2020).

1.2 Goals and Measures

The following table summarises key aspects and goals regarding the added value and impact of citizen science in Switzerland. In addition, it provides concrete examples of measures and specifies which actor group(s) might implement each measure. Achieving the most added value and the highest impact possible for a citizen science project requires more time than for a normal research project. Project funding and employment conditions must be adapted accordingly. In addition, research evaluation needs to accommodate the special conditions of citizen science projects. Particular attention must be paid to the visibility of results, the effects of outcomes, and the impact. This requires dedicated communication efforts, which necessitates specific training.

Goals	Concrete Measures	Actors (see I.III)
Make the added value of citizen science visible.	Create and coordinate training opportunities so that citizen science practitioners can name outcomes and impact.	<ul style="list-style-type: none"> > Ad hoc working group > Higher education institutions > Non-academic institutions
	Plan the evaluation of outcomes and impact from the onset of a project onwards. Include all involved partners in this process.	<ul style="list-style-type: none"> > Citizen science practitioners
	Present projects in an impact-oriented manner. Include all involved partners in this process.	<ul style="list-style-type: none"> > Citizen science practitioners
	Make outcomes and impacts visible via specific platforms and/or analogue formats of knowledge exchange such as exhibitions.	<ul style="list-style-type: none"> > Coordination point > Citizen science practitioners
Make employment structures more favourable for citizen science projects to have an impact.	Create long-term positions, for example for experts in participation or community involvement.	<ul style="list-style-type: none"> > Higher education institutions > Non-academic institutions
	Diversify academic job roles to include positions for outreach, engagement, community management, and participatory policy.	<ul style="list-style-type: none"> > Higher education institutions
	Establish citizen science on a strategic level (for example as its own organisational unit, like at → UZH/ETH, → UNIGE, and → UNIL, or in connection with open science, like at the → Bern University of Applied Sciences).	<ul style="list-style-type: none"> > Higher education institutions > Non-academic Institutions
Establish citizen science projects and programmes with a time horizon that is long enough for societal impacts to materialise.	Support citizen science institutions that have long-term structures such as parks, museums, libraries, and associations.	<ul style="list-style-type: none"> > Funding agencies
	Fund long-term research programmes, ideally as cooperative endeavours among various actors and structures (e.g. the SNSF's National Research Programme (NRP) 82 on biodiversity) in order to allow the impact to materialise and be measured	<ul style="list-style-type: none"> > Funding agencies > Higher education institutions > Non-academic institutions
Ensure that research assessments account for the specific characteristics and added value of citizen science.	Reconsider research assessments so that they value citizen and community involvement, social exchange, outreach, local impact, and similar processes.	<ul style="list-style-type: none"> > Funding agencies > Ad hoc working group
	Implement assessments that already go in this direction such as the → Reforming Research Assessment and the San Francisco Declaration on Research Assessment (→ DORA).	<ul style="list-style-type: none"> > Funding agencies > Higher education institutions
	Make sure to select suitable reviewers, i.e. citizen science practitioners for citizen science projects	<ul style="list-style-type: none"> > Funding agencies
	Engage non-academic evaluators, for instance when it comes to the feasibility of a project's non-scientific ambitions (as proposed by → technopolis).	<ul style="list-style-type: none"> > Funding agencies

2 Funding

Like any research, citizen science depends on funding, especially from third parties. Funding co-determines a project's scope and guarantees quality and sustainability. Grant applications for citizen science projects must underline why certain research questions are best studied by applying citizen science methodology. This, in turn, implies that the project modules that are characteristic for citizen science (such as training, infrastructure, outreach efforts, communication, and community management) must be outlined in the grant proposal and need to be budgeted accordingly. This chapter presents various sources that might pledge money for citizen science.

As already stated, citizen science works differently than traditionally funded research and thus requires different evaluation and impact criteria. New evaluation grids should be created that include non-academic evaluators and peers when it makes sense. Citizen science should receive funding at multiple levels: for science policy and institutions (both within and outside higher education institutions) as well as for infrastructure development (such as rooms for public meetings or apps tailored for participation), capacity building and training, project-specific funding, community engagement, and more. Funding should also be made available for non-institutionalised project coordinators, for example citizens doing a citizen science project. Adequate funding across these different areas is essential to ensuring the success and sustainability of citizen science initiatives.

2.1 Current Situation

2.1.1 Funding Framework

Funding entities hold significant power in shaping research outcomes and are pivotal in generating socially relevant, practical, and innovative knowledge. While Switzerland has various funders supporting scientific research, there is currently no specific funding programme focused on long- or medium-term support of citizen science projects. Nonetheless, several promising initiatives are emerging.

Finding funding for citizen science projects requires considerable knowledge about the funding landscape, know-how regarding filing applications (e.g. the use of specific keywords), and a solid understanding of

the various processes (e.g. if preliminary phone calls for clarification are necessary or appropriate). When it comes to funding, citizen science shares many of the challenges facing other forms of research that involve non-academic stakeholders. Often, citizen science tends to be applied research, which is more difficult to find funding for than basic research. In this regard, it is imperative for citizen science projects to formulate clear and relevant scientific questions. For funders and other institutions that do research assessments, it is challenging to find reviewers who are competent specifically in citizen science because it is still an emerging approach.

Even though most citizen science projects must be continually adapted, many funders expect detailed schedules with milestones such as work packages, outputs, and outcomes. Additionally, in some projects, the process of collaborative research and collective learning is as important as the output or the results. Another problem – not only for citizen science – is that the work done during the application process is often unpaid. This is particularly problematic for citizen science because this is often the time when scientific and social partners get to know each other, build mutual trust, and develop a common set of issues. Due to these processes, citizen science often requires more time to develop than conventional research.

As with traditional research projects, many different posts potentially need to be financed in citizen science. Different kinds of personnel – scientific staff, managers, communicators, data collectors, and citizen scientists – require salaries or other compensation. Other costs that often must be covered include training, material, rooms, evaluation, dissemination, and infrastructure such as computers, software, and laboratories. In addition, most citizen science projects need to set up a community of citizen scientists and maintain that network. This is usually a long-term endeavour; citizen science projects often operate with longer time frames than traditional research without citizen involvement.⁴⁴ Not all of these costs are covered by funding entities, and many grants are short-term only. Overall, applying for research funding can be time-consuming; therefore, sufficient time should be allocated for it. Most universities offer their employees support in the form of grants offices. When applying for funding from a foundation, it is imperative to consider the foundation's mission and tailor the application to it.

⁴⁴ Desclaux (2021).

In general, citizen science often faces a dilemma when it comes to finding funds. When applying for science funding, citizen science is frequently dismissed by the academic community as not being scientific enough. When applying for money from a pot designated for cultural, political, or participatory initiatives, citizen science is then considered science funding. To overcome this dilemma, the expert group recommends both introducing specific citizen science grants and reforming the current research assessments. The former already exist in German-speaking countries. For example, the Austrian Science Fund has the → [Top Citizen Science](#) programme. Germany's Federal Ministry of Education and Research offers specific funds for citizen science projects in their → [Förderrichtlinie Citizen Science](#). In Switzerland, academic researchers have claimed they could do more citizen science if there was specific funding for it and if their professional environment valued the approach more.⁴⁵

2.1.2 Different Levels of Funding

There are a few organisations in Switzerland that support and finance citizen science on a **structural level**.

The → [Swiss Academies of Arts and Sciences \(a+\)](#) have underscored the importance of citizen science by including it in their → [multi-annual planning](#) for 2021–24 as well as for 2025–28. This permits Science et Cité and its network Schweiz forscht/Tous scientifiques to continue and intensify their activities. The network is financed to provide a stable umbrella structure for citizen science in Switzerland, and it serves to inform, communicate, and coordinate. In addition, it anticipates important developments and fosters mutual learning within the citizen science community.

The → [Stiftung Mercator Schweiz](#) foundation made it possible to establish the Participatory Science Academy (PWA) at UZH/ETH in 2018. The foundation approved a second phase for the 2021–2025 period to consolidate what had already been successfully set up and to make the necessary adjustments for the future on the basis of the experience gained. In this process, the PWA merged with the Competence Center – Citizen Science at UZH/ETH Zurich to form what is now Citizen Science Zurich.

The most specific citizen science **project funding** comes from → [Citizen Science Zurich](#), which awards seed grants each year. These grants create incentives for the participatory development and/or implementation of research projects. Teams of academic researchers from UZH and/or ETH Zurich and citizens are given the opportunity to develop and/or carry out a participatory research project. Priority is given to projects that, in addition to offering the prospect of excellent research, demonstrate a high degree of participation in as many phases of the research process as possible. Since 2019, 34 projects have received seed grants in disciplines such as medicine, the humanities, and the sciences. These projects are often able to raise additional funds.

The → [Swiss National Science Foundation \(SNSF\)](#) is the leading Swiss institution for promoting and funding scientific research. In general, applicants must be members of a higher education institution. Although it originally funded mostly basic research, the SNSF has increasingly supported new research formats, including participatory research. This started with the programme → [DO REsearch](#) (1999–2011). At present, several SNSF funding schemes are potentially interesting for citizen science projects seeking funding, including the following:

- → [Agora](#) “aims to foster dialogue between scientists and society”. It is a science communication scheme and does not fund research. An Agora project should be as dialogical as possible, and researchers should listen to their target public. This approach makes it possible to co-create ideas and approaches for future researchers.
- → [Spark](#) funds “the rapid testing or development of novel and unconventional scientific approaches, methods, theories, standards and ideas”.
- → [Bridge](#) “offers funding at the interface of basic research and science-based innovation” (a joint programme with Innosuisse, see below).

In addition, the SNSF funds citizen science projects through regular project and career grants (e.g. → [CrowdWater](#), → [CoFish](#), and → [Rethinking Science and Public Participation](#)). It also supported the European Citizen Science Association's (ECSA's) conference in 2018 and the CitSciHelvetia conference in 2023. In November 2022, the SNSF held a *séance de réflexion* on citizen science and transdisciplinary research. Having signed the

⁴⁵ Stämpfli (2019).

→ [San Francisco Declaration on Research Assessment \(DORA\)](#) and the European → [Agreement on Reforming Research Assessment](#), the SNSF has taken important steps towards further enabling the funding of citizen science. Indeed, some of the → [SNSF's priorities for 2025–2028](#) promise valuable links and possibilities for citizen science. For example, the SNSF seeks to “support collaboration between researchers and non-scientific actors” (SNSF’s Multi-Year Programme 2025–2028, p. 19) and to contribute to the UN’s Sustainable Development Goals through living laboratories (p. 25).

Many Swiss higher education institutions have open science support programmes. While they usually focus on technical and personal support, some institutions grant small funds. This is also true for swissuniversities’ Open Science programme. With convincing argumentation, it might be possible for citizen science projects to receive funding, at least for aspects related to open access or open research data, which are currently the most frequently supported areas.

Citizen science projects in Switzerland may also potentially receive funding via COST (European Cooperation on Science and Technology) or the European Framework Programmes (currently Horizon Europe), which have funded larger citizen science projects in the past. The latter is perhaps the most important funding and networking source for citizen science on an international level, and it allows applications from non-academic stakeholders. → [Citizen Science Zurich](#) is involved in three projects that are funded by the European Union within the framework of the Horizon 2020 programme: → [TIME4CS](#), → [Crowd4SDG](#), and → [INCENTIVE](#). The University of Geneva was part of the → [Doing-It-Together Science](#) project.

Besides these academic options, there is a vast array of possible funders that may grant money for citizen science projects. Some of the various possible options are given in the following list. Since funders may change their focus and purpose, an enquiry needs to be made before applying. Please note that this is not a comprehensive list but serves to provide examples and ideas about potential funding options. Some disciplinary networks, associations, and organisations provide information on discipline-specific funding options that may not be listed.

Potential Funding Bodies

The → [Ernst Göhner Stiftung](#) supports projects in the areas of culture, the environment, social issues, education, and research. The foundation places a special focus on sustainability.

The → [Charles Léopold Mayer Foundation for Human Progress \(FPH\)](#) “supports civil society movements and organisations in their activities advocating for a social and ecological transition”.

The → [Leenaards Foundation](#) supports projects from Vaud and Geneva in three thematic fields: culture, age and society, and sciences and health.

The → [Gebert Rüt Stiftung](#) “promotes innovation for the benefit of Switzerland’s economy and society” and “makes science effective by initiating impact-oriented innovation projects”.

→ [Innosuisse](#), a Swiss federal entity, “promotes SMEs, startups and other Swiss organisations in their R&D activities”.

Swiss cantons’ → [lottery funds](#) have a very broad mission and support projects “in the areas of the arts, sports, the environment, and social welfare”. The → [Loterie Romande](#) explicitly supports projects in the field of “education, training, and research” as well.

→ [Migros Commitment](#) supports projects in the following fields: living together, culture, health, education, climate and resources, technology, and ethics.

The → [SKKG](#) foundation (Stiftung für Kunst, Kultur und Geschichte) provides strategic and partnership-based support through its three funding programmes Venture, Scaling, and Structure, which are in the field of museum participation.

The → [Stiftung Mercator Schweiz](#) is a foundation that supports projects in the three fields of democracy, diversity, and climate/biodiversity as well as the programmes Digitalisation + Society, Civil Society + Philanthropy, Arts.Culture. Transformation, and Learning of the Future.

→ [Swiss Cancer Research](#) funds 60–80 projects annually in its field.

The crowdfunding platform → [wemakeit](#) occasionally organises a science booster that is financed in various ways.

Public administrations sometimes carry out or co-finance citizen science projects through federal government research (see Section I.II).

Various other foundations also support citizen science projects if they serve their purpose. The → [Federal Foundation Registry](#) is a helpful guide. There are also cantonal directories.

2.2 Goals and Measures

The following table summarises key aspects and goals regarding funding that would help citizen science thrive in Switzerland. In addition, it provides concrete examples of measures and specifies which actor group(s) might implement each measure. Research assessments as well as funding schemes and structures must allow for innovation and failure. For citizen science to unleash its full potential, long-term structures need to be established and financed, for example to allow for community building and evaluation. At the moment, it may be helpful for projects to look for funding from different sources for different positions. For a fair assessment, it is paramount that reviewers are specialists in citizen science. In addition, non-academic actors need to be better integrated into the whole process.

Goals	Concrete Measures	Actors (see I.III)
Acknowledge that citizen science, like other forms of research involving non-academic actors, is a rather new set of methodologies, it often works with innovative and new concepts (such as living labs, empowerment, co-production, social change, social relevance, distributed innovation, and distributed expertise), and it is constantly evolving. Failure is recognised as part of the learning process.	Offer seed money – an easily available, small amount of initial funding that helps to build the foundation of a larger project. Examples of seed funding include → UNIL's Centre interdisciplinaire de recherche sur la montagne , → CSZ's Seed Grants , and the preparatory grant within the → SNSF's NRP 82 .	> Funding agencies > Higher education institutions
	Create new and appropriate evaluation and impact criteria. For example, use the criteria that the research group as a whole has the necessary expertise and skills to run a citizen science project rigorously and competently (e.g. guided by the → 10 Swiss Citizen Science Principles , as practiced by the → Hans Sauer Stiftung) and that partners are involved in the elaboration of the research design and problematisation when relevant.	> Funding agencies
	Encourage research on citizen science (e.g. methodology, ethics, budget needs, training, volunteer management, added value, community building, diversity, and inclusion).	> Funding agencies
Acknowledge the challenge of writing a grant proposal for citizen science projects, which are characterised by an iterative process that is often difficult to predict and may require unplanned adaptations.	Develop and offer training (for academics and non-academics) on how to write a smart and original funding application, for example with a checklist (similar to what → vitaminB , → Fundraisio , → benevol , and other organisations offer).	> Ad hoc working group
Expand the options for citizen science funding.	Look for topic-specific funding (instead of funding that specifically targets citizen science) and for funding that is not specifically earmarked for research.	> Citizen science practitioners
	Apply for money from different sources for different posts (e.g. communication, research, and events).	
	Provide an overview of possible funding institutions (similar to, e.g., the → Foundation Registry).	> Coordination point

<p>Align funding schemes with the needs of citizen science projects to account for the intricacies of citizen science and the unique requirements it entails.</p> <ul style="list-style-type: none"> > Grants are usually short-term (five years maximum, usually much shorter). Citizen science normally requires a longer time frame. > It is often not possible to allocate money according to the specific needs of citizen science. Strict guidelines make it complicated to cover certain costs, such as the compensation of citizens, external personnel, infrastructure, and communication. 	<p>Carefully select the reviewers for citizen science projects and ensure they are experts in citizen science.</p> <p>Introduce a review process that enables discussions among reviewers.</p> <p>Allow non-academic actors to apply for funding, as → Horizon Europe currently does.</p> <p>Fund long-term positions to ensure the quality and continuity of citizen science projects and/or to fund what comes after the project, for example through the “third sector of research” (as done in → France with the → Tiers-Lieux programme).</p>	<ul style="list-style-type: none"> > Funding agencies > Funding agencies > Funding agencies > Funding agencies > Higher education institutions > Non-academic institutions
<p>Enable researchers and practitioners to stay updated on frequently changing funding conditions and formalities.</p>	<p>Ensure transparency in specific calls and their criteria, for example by publicly disclosing them or establishing regular informational events to keep researchers and practitioners informed.</p>	<ul style="list-style-type: none"> > Funding agencies > Coordination point

3 Training

A specific feature of citizen science projects is that they not only aim at generating new scientific knowledge but they also have a significant and explicit educational dimension and can be directed towards social change. Everyone involved in citizen science projects learns something. Citizens often receive specific training to carry out their tasks. A considerable amount of research has been done on how they increase their scientific literacy with citizen science, in other words what they learn about science.⁴⁶ It is thus not surprising that much of the literature focuses on training for citizens so they produce good and valuable data as well as scientific knowledge in general.

In contrast, there is a lack of research and literature on how scientists can engage competently in citizen science. This chapter thus focuses on this often neglected aspect: what researchers need to know before embarking on a citizen science project and where they can acquire the competencies needed. It is worth highlighting that many of these competencies are beneficial for all researchers. The 2022 white paper on citizen science in Germany notes that citizen science as a scientific methodology is rarely part of academic teaching.⁴⁷ In Switzerland, there is a lack of qualified teachers due to a lack of training opportunities. Part of the reason for this is that citizen science is not included in academic curricula in Switzerland. This is notable because the lack of training opportunities stands in contrast with the increased efforts to promote citizen science as a scientific methodology.

3.1 Current Situation

3.1.1 Training Framework

The → [10 Swiss Citizen Science Principles](#) form the basis of a common understanding of key values. Everyone involved in citizen science is invited to consider and incorporate these principles when launching their project. However, agreement still needs to be reached as to which competencies people need to start and carry out a citizen science project. Little research on the subject currently exists. Citizen Science Zurich's → [Modular Research Course](#) serves as a useful guide to identify which competencies people need to successfully embark on a citizen science project and bring it to a successful end.

The course also serves as a good example of how cooperation between various partners helps bundle expertise. The course modules tackle the following questions:

- What is citizen science? Is what I do called citizen science? (Basis)
- How can I identify the impact of my project, and how can I work towards it in the most effective way possible? (Impact-Oriented Planning of Citizen Science Projects)
- What do I need to consider when planning my research project? (Research Design for Participatory Citizen Science)
- How do I find citizens who are willing to participate in my project? And how do I motivate them to stay involved? (Community Management)
- How do I need to facilitate a participatory process? (Facilitating Participatory Research Processes)
- How can I bring together different types of knowledge? What is the role of researchers in this endeavour? (Inter- and Transdisciplinary Integration)
- What do I need to consider when planning and implementing my citizen science project's evaluation? (Evaluation Step-by-Step: How to Assess Project Impacts)

3.1.2 Training Institutions and Initiatives for Researchers

At the European level, the European Citizen Science Association's (ECSA's) → [Citizen science and universities](#) working group shares many of the concerns mentioned in this chapter as its purpose is "to advocate and support the embedding of citizen science activities at the university level, both for research and education purposes". The → [D-A-CH](#) working group for citizen science regularly offers workshops and training. For example, the group organised an introductory webinar on the topic of Open Data in Citizen Science Projects in July 2023 and will continue the series with hands-on workshops tailored to the different scientific disciplines. The D-A-CH working group is flexible and thus able to adapt to the changing needs of the community, and it tries to anticipate future developments. The University of Natural Resources and Life Sciences in Vienna (BOKU) and mit:forschen! from Germany have courses that may be open to participants from Switzerland (see table below).

⁴⁶ Kloetzer (2021); Lorke and Schmid-Loetzer (2022).

⁴⁷ Bonn, A. et al. (2022). Weißbuch Citizen-Science-Strategie 2030 für Deutschland. Helmholtz-Gemeinschaft, Leibniz-Gemeinschaft, Universitäten und außeruniversitäre Einrichtungen, Leipzig, Berlin, 84 and 87. <https://doi.org/10.31235/osf.io/ew4uk>

In Switzerland, citizen science as a scientific methodology is hardly visible in teaching at higher education institutions (HEIs) and beyond. There are, however, a few institutions that do offer citizen science training and teaching that is relevant for citizen science (see table below). Please note that the following table is not exhaustive; it contains courses the expert group and reviewers were aware of at the time of writing this report.

There are various possible explanations for the lack of educational opportunities for researchers in citizen science:

1. There is limited recognition that citizen science demands unique skills and competencies not typically addressed in traditional academic training.
2. The prevailing disciplinary structure within HEIs obscures responsibility for fostering the cross-disciplinary aspects of citizen science.
3. Academic disciplines often fail to perceive the inherent value that citizen science can bring to their respective fields.
4. The availability of qualified educators within HEIs is scarce, and this is coupled with bureaucratic obstacles that hinder the recognition of external instructors.
5. A significant portion of researchers do not recognise the necessity of acquiring supplementary competencies to engage effectively in citizen science.

Courses on Citizen Science and Related Topics

Institution(s)	Course Title	Description	Format	Target Group(s)
UZH/ETH – CSZ	→ Citizen Science Modular Research Course	<ul style="list-style-type: none"> > Obtain an overview of the current citizen science debate and become familiar with the main arguments/viewpoints. > Learn about different fields of application for and approaches of citizen science as well as selected methods and tools along with their limits and possibilities (advantages and disadvantages). > Become familiar with selection criteria and principles in order to better decide when citizen science/participatory methods are useful for a specific (e.g. one's own) research project. 	In person	PhDs, postdocs, project coordinators, and citizen scientists
UZH/ETH – CSZ and School for Transdisciplinary Studies	Introduction to Citizen Science	Introduction to citizen science through examples of participatory projects. The course facilitates discussions on the goals, functions, benefits, and challenges of citizen science.	In person and occasionally online	
UZH/ETH – CSZ and School for Transdisciplinary Studies	Citizen Science: From Theory to Practice	Using concrete project examples from different disciplines, students gain insights into the specifics of participatory research processes. During the course, students develop their own citizen science project ideas.	In person and occasionally online	
UZH CSZ	Introductory Workshop: Citizen Science Projects with Impact	The steps of impact orientation are demonstrated by means of an example and are directly applied by the participants to their own research objects.	Alternately online and in person	Open
UZH/ETH – CSZ and catta	→ Online workshop for libraries and archives → Online workshop for museums	Participants learn about the characteristics and processes of a citizen science project and get an overview of the most important actors of participatory research in Switzerland. They can plan their own citizen science project independently after the course.	Online	Librarians and archivists Museum staff

UZH/ETH – CSZ and td-net	→ Methoden am Montag	On the first Monday of each month, participants present a method selected from the td-net toolbox, following the phases of a research project. On the following Monday, concrete questions and practical challenges are addressed in an open office hour.	Online	
UZH/ETH – CSZ and Graduate Campus	→ Citizen Science Summer/Winter School	<ul style="list-style-type: none"> > Obtain an overview of current citizen science debates and learn the essential arguments. > Learn about different approaches of citizen science as well as its methods and tools along with their limits and possibilities. > Learn to decide how participatory approaches can be useful for one's own research project. > Become familiar with principles, methods, and tools for participatory process design and support. > Gain insights from current citizen science activities in Zurich with a high degree of participation. > Exchange ideas and experiences with researchers connected to citizen science and local citizens. 	In person	PhDs, postdocs, and citizen scientists
ETH TdLab	→ Environmental Problem Solving	<ul style="list-style-type: none"> > Students learn how to deal with challenges and which strategies and aspects are essential for a functioning cooperation with stakeholders. > Students learn to combine a view of the whole (systems thinking) with a focus on a specific problem and its solution (design thinking). 	In person	BSc students
ETH TdLab	→ Transdisciplinary Case Study	<ul style="list-style-type: none"> > Students learn how to understand a case and its context from a variety of perspectives and to extract multiple ways of framing, analysing, and developing potential solutions for the problem at hand. > Define relevant research questions in a (wicked) sustainability problem. > Select and apply tools/methods to collect, analyse, and interpret data in order to answer research questions. > Work in an interdisciplinary team. > Collaborate with stakeholders. 	In person	MSc students
ETH TdLab	→ Transdisciplinary Research: Challenges of Interdisciplinarity and Stakeholder Engagement	Participants learn about specific challenges of inter- and transdisciplinary research and address them by applying practical tools. They tackle questions such as how to integrate knowledge from different disciplines, how to engage with societal actors, and how to secure broader impact of research. They learn to critically reflect on their own research project in its societal context and on their role as scientists.	In person	PhD students and postdoc researchers
ETH TdLab	→ Integration in Science, Policy and Practice: Inter- and Transdisciplinary Concepts, Methods, Tools	Meeting environmental and societal challenges requires responses that integrate a wide range of perspectives from different disciplines (i.e. interdisciplinary integration) as well as from science, policy, and practice (i.e. transdisciplinary integration). Drawing on case studies, students explore concepts, methods, and tools of integration in a hands-on, experiential setting.	In person	MSc students

CoLaboratory UNIL	Cycle de conferences: → Recherche participative, recherche-action: vers un nouveau contrat entre sciences et société ?	Relations between the world of research and the public are often limited to scientific mediation or dialogue approaches. In addition to these now classic approaches, there is an arsenal of methods and procedures for involving citizens directly in the production of knowledge: crowdsourcing, participatory, collaborative, and partnership research, action research, etc. How can these methods be implemented to produce scientifically relevant results? What are their advantages and pitfalls?	In person (videos available)	
University of Bern and UNIL	Citizen Science and Crowdsourcing	These courses are part of the → Master of Advanced Studies in Archival, Library, and Information Science .	In person	Librarians, archivists, and information scientists
Objectif Sciences International	→ Science Educator	This four-day science education training course focuses on participatory research and citizen science.	In person	Open to anyone
BOKU Vienna	→ Citizen Science in Ecology	Students learn the key elements of conducting a citizen science project in the field of ecology (e.g. spatial data analysis, legal aspects, and communication).	In person	BA and MA students
BOKU Vienna	→ Public Engagement und die Third Mission: Wie kann ich meine Forschung mit Citizen Science öffnen?	This is an introductory workshop in citizen science for project development.	In person	Junior researchers
BOKU Vienna	→ Citizen Science Seminar	Participants gain an insight into current research and projects in the field of citizen science and learn not only how a project can work but also what pitfalls exist.	Hybrid	Open to anyone
mit:forschen!	→ Training workshop: Basismodul: Einführung in Citizen Science.	This workshop offers an introduction to citizen science with the option to develop one's own ideas or projects. The advanced modules (law, communication, evaluation, and volunteer management) provide an overview of topics relevant to the implementation of projects. Additional modules are being planned.	Online	Project initiators, citizen science practitioners, and disseminators

3.1.3 Online Tools and Resources for Citizen Science Practitioners

In addition to the more formal educational opportunities listed above that are mainly offered as courses at higher education institutions, many online resources exist that can support citizen scientists and academic scientists in designing and running citizen science projects. Most of them are free of charge and can be used at any time.

The → [Citizen Science Project Builder](#) from Citizen Cyberlab (University of Geneva) and Citizen Science Zurich is a web-based tool that allows users to create and run data analysis projects with a simple, step-by-step process.

→ [Citizen Science Logger](#) from Citizen Science Zurich allows users to create citizen science data collection projects in the form of a smartphone app. Creation happens via a web interface with a simple, step-by-step process.

→ [Das Co-Creation Toolkit](#), written by Kerstin Kurzhals et al. and published by Springer in 2022, contains methods for successful cooperation between higher education institutions and society.

→ [Ein Projekt starten](#) from Österreich forscht is a compilation of tried-and-tested resources.

→ [eu-citizen.science](#), a Horizon 2020 project, is a platform for sharing citizen science projects, resources, tools, training, and much more.

The → [Handbuch für Citizen-Science-Projekte](#) from mit:forschen! is an online handbook that addresses the following questions: How do I set up a citizen science project? What do I need to bear in mind when planning and implementing a project? What best practice examples are there? What can participatory research look like in different areas? It is sometimes tailored to specific areas, for example → [nationale Naturlandschaften](#) (national natural landscapes).

The → [Methods and tools for co-producing knowledge | Capacity Building](#) web portal from the Swiss Academy of Sciences focuses on written descriptions of how to proceed when applying a method and how to do it → [thoughtfully](#).

→ [Practicing Citizen Science in Zurich: Handbook](#) from Citizen Science Zurich is a practical guide on how to successfully design and run co-created citizen science projects. It includes some specific tips for practitioners in Zurich.

The → [SciStarter](#) website from Arizona State University (National Science Foundation) contains a module on the foundations of citizen science and in-depth courses on data literacy and ethics, libraries as hubs, and teaching with citizen science.

With → [td-MOOC](#) from td-net, it is possible to explore how to meet the challenges of conducting effective transdisciplinary research.

The → [Toolkit Inventory](#) from the Global Alliance for Inter- and Transdisciplinarity (ITD Alliance) contains a collection of toolkits on methods, procedures, concepts, heuristics, and other resources that can be used in designing and implementing interdisciplinary or transdisciplinary processes in research, practice, and education.

The → [Virtual Ecosystem for Research Activation \(VERA\)](#), a platform of the Collaborative Engagement on Societal Issues (COESO) project and the OPERAS research infrastructure, empowers participatory research in the social sciences and the humanities by making it easy to create a diverse team, find funding, work together, and share with the world.

3.2 Goals and Measures

The following table summarises key aspects and goals regarding the training needed to strengthen citizen science in Switzerland. In addition, it provides concrete examples of measures and specifies which actor group(s) might implement each measure. Given the scarcity of training opportunities for citizen science skills, it is imperative that institutions work together to provide different forms of courses. Various competencies are needed for citizen science, and many of them are useful for other activities as well.

Goals	Concrete Measures	Actors (see I.III)
Offer training for citizen science practitioners.	Develop a citizen science training programme (e.g. a Certificate of Advanced Studies (CAS) programme, a summer school, or a massive open online course (MOOC)) that can be offered by different institutions in Switzerland. Ideally, this should not only cover citizen science but also be combined with other participatory approaches.	> Ad hoc working group
	Increase higher education teaching opportunities for citizen science and the competencies it requires, and make those offers more visible and accessible (within and outside the institution as well as for citizens).	> Higher education institutions (ideally in collaboration, e.g. through → project contributions of the SHK/CSHE)
	Offer hands-on workshops.	> Non-academic institutions
Spark interest in citizen science among students/academics.	Develop an introduction to citizen science that can be included in the basic curriculum of various disciplines (e.g. through a short introductory video shown in methodological lectures).	> Ad hoc working group > Higher education institutions
Offer training opportunities for students/academics.	Develop courses that span departments.	> Higher education institutions
Increase the diversity of those providing citizen science training.	Recognise trainers from outside of academia.	> Higher education institutions
Give citizen science practitioners an overview of the courses and training available in Switzerland.	Set up an "ambassador's network" among higher education institutions and other citizen science training organisations to coordinate efforts.	> Coordination point
	Establish a living document with teaching opportunities for citizen science in Switzerland that focuses on the characteristics of courses rather than institutional differences.	> Coordination point
Create an awareness among funders, research managers, and researchers that the success of citizen science depends on the competencies of citizen science researchers, and create corresponding training opportunities.	Offer training not only in science communication but also in participatory approaches, community management, etc. Consider a course that combines these issues, for example under the umbrella "public engagement", as is done in anglophone countries.	> Funding agencies > Higher education institutions > Ad hoc working group
Create an overview of or agreement on which competencies are necessary for researchers when preparing and implementing a citizen science project (e.g. guided by the → 10 Swiss Citizen Science Principles).	Identify competencies needed for citizen science that are beneficial for all researchers (outreach, science communication, etc.), and include training for these competencies in general academic curricula.	> Ad hoc working group

4 Communication and Visibility

Due to the participatory nature of citizen science, the utmost importance must be placed on internal and external communication. The issue can be summarised as follows:

Citizen science projects rely on public involvement, making a communication and dissemination strategy essential to their success and impact. This needs to include many aspects, such as identifying the audience, selecting the communication channel(s), and establishing the right language to use. Importantly, citizen science projects must expand beyond traditional top-down monologue interactions and embrace two-way dialogue approaches, especially when communicating with project participants. Further, to be effective, communication activities require good planning and dedicated resources.⁴⁸

Internal communication, as understood by the expert group, is the way in which project participants interact with each other, for example to remain updated and involved. According to → [Swiss Citizen Science Principle 5](#), good communication entails not only that the expectations and workflow are clearly communicated (participation level, scientific methods, use of data, research outcomes, authorship, etc.) but also that the different interest groups are addressed accordingly (see also Chapter 3 on training).

The focus of this chapter is external communication and visibility. This refers to how citizen science is promoted as a methodology or general concept to researchers, funding partners, and the general public. In short, it relates to how the visibility and public perception of citizen science in general and of specific projects in particular are managed.

4.1 Current Situation

4.1.1 Communicating Citizen Science on a General Level

In the past few years, various national and regional organisations that potentially promote, coordinate, fund, or do citizen science have given the concept increased attention and acknowledged its value for themselves, their members, and society at large.

Science et Cité has been involved with citizen science since at least 2014, when it compiled an initial overview of projects in Switzerland and asked the Swiss citizen science community about its needs.⁴⁹ One result of this was the establishment of the Office for Citizen Science in Switzerland and its network and platform Schweiz forscht/Tous scientifiques at Science et Cité in 2015. Two of the network's aims, among others, are to increase the visibility and appreciation of citizen science in Switzerland and to bundle and share competencies. To these ends, it connects relevant actors, organises network meetings, prepares regular newsletters, (co-)organises conferences (e.g. ECSA 2018 and CitSciHelvetia'21 and 23), and initiates and coordinates common guidelines and reports, such as the → [10 Swiss Citizen Science Principles](#) and this report. The platform and network are continually developed with the involvement of the community. Since 2021, citizen science has been consolidated as a long-term topic within the Swiss Academies for Arts and Sciences, with Science et Cité taking the lead as its centre for competence in dialogue.

During the strategic preparation of swissuniversities' Open Science programme, citizen science was one of three action lines and led to the 2019 report titled Perception of and Experience with Citizen Science at Higher Education Institutes (HEI).⁵⁰ At present, swissuniversities regularly provide information about their → [current programme](#) and its connection with citizen science in their → [newsletter](#), and they occasionally organise events related to citizen science.

Through its numerous and varied activities, → [Citizen Science Zurich](#), a joint initiative of the University of Zurich and ETH Zurich that is supported by the Mercator foundation, contributes to increasing the visibility of citizen science far beyond Zurich's science landscape.

The → [Citizen Cyberlab](#), located at the SDG Solution Space in Geneva, capitalises on its proximity to global policy centres to build partnerships with international organisations and NGOs for education, innovation, and research. In doing this, it communicates the value of citizen science in these fields and increases the visibility of the approach.

⁴⁸ Rüfenacht et al. (2021).

⁴⁹ Flück and Viviani (2014).

⁵⁰ Stämpfli (2019). See also <https://www.swissuniversities.ch/en/topics/digitalisation/open-science/strategic-preparations>

Swiss Park Research at the Forum Landscape, Alps, Parks (→ FoLAP) published a report in 2022 on the status of citizen science in Switzerland's 23 parks and UNESCO World Heritage Sites. In March 2024, citizen science was part of the experience exchange of those responsible for park research.

The Swiss Museums Association produced a substantial publication on → [citizen science in museums](#) in late 2023. A year earlier, the association's annual congress was dedicated to the topic of → [participation and involvement - museums in transition](#). In March 2024, → [two workshops](#) on citizen science in museums were held, one in French and one in German.

These organisations and associations communicate with specific target groups. On the one hand, they illuminate the relevance of citizen science among their peers and stakeholders. On the other hand, they address policymakers and funders with the vocabulary appropriate for conveying the relevance of citizen science to these groups that secure the necessary frameworks and funding support.

The communication efforts of different citizen science interest groups are very important for increasing the visibility of citizen science among different communities. Academic researchers, for example, claim that knowing more about the approach would help them to practice more citizen science. Many of the communication initiatives around citizen science, however, are rather fragmented, and the different discussions and efforts need to be better coordinated in order to ensure a common understanding among the various organisations and individuals.

This is not to claim that there is no communication among the different citizen science actors in Switzerland. Nonetheless, concerted efforts to increase the visibility of citizen science at large are rare. A notable exception was the publication of the → [10 Swiss Citizen Science Principles](#) that aim to advance a common understanding of the basic cornerstones of citizen science. The Office for Citizen Science in Switzerland united key actors in citizen science in Switzerland (Participatory Science Academy and Competence Center – Citizen Science in Zurich, Citizen Cyberlab, and Swiss Academies of Arts and Sciences) to draft that important document. They subsequently organised an online consultation to include the feedback of the broader community. The docu-

ment was published in four languages in autumn 2022 and continues to serve as a guideline to consider when launching and evaluating a citizen science project. In 2024, Citizen Science Zurich and Schweiz forscht/Tous scientifiques published a checklist for this purpose.

In summary, many relevant actors have citizen science on their agenda and acknowledge its relevance. Various science-related institutions in Switzerland reflect on their relationship with citizen science and what they could contribute to its advancement. An important next step is to broaden these discussions and increase the visibility of citizen science among possible project participants. When it comes to the visibility of citizen science among society at large, much remains to be done and there is considerable potential to be unlocked.

4.1.2 External Communication of Projects

Ongoing projects, and especially their outcomes, can generate visibility for citizen science in general. Calls for participation, whether local or broad, and the presentation of results, whether spectacular or mundane, provide excellent opportunities to draw attention to the benefits of the approach. Communicating specific citizen science projects concretely demonstrates what science can do on a local level, why it is useful, and that participation is not only important but also fun. Moreover, it offers a sense of empowerment to people by giving them the possibility to contribute to science or do it themselves.

A 2021 representative study of the Swiss population revealed that only 8% of respondents had heard the term “citizen science” and only 15% were familiar with the term “participatory research”. However, 48% of those surveyed indicated they would be willing to participate in such a project. Another study suggests that roughly a third of the Swiss population is interested in citizen science and “could potentially be engaged”, most preferably by being “addressed online via YouTube or offline in zoos or botanical gardens”. Galleries, libraries, archives, and museums are other places to engage potential citizen scientists.

Another option for increasing the general public's awareness of citizen science is via media reporting. Larger articles on citizen science in general or on a particular project are regularly published. Yet there is

much untapped potential. For example, local media or magazines published by associations and organisations can reach a considerable number of potentially interested readers. To this end, media professionals need to know where they can get expertise on citizen science when they seek it.

The relevance of science communication for project coordinators has increased in the past few years. They are now expected to communicate information about their projects to the general public on a broader scale than before. This is exemplified by new research assessment values, as promoted by the Coalition for Advancing Research Assessment's (CoARA's) → [Agreement on Reforming Research Assessment](#), or funding schemes like the SNSF's → [Agora](#). It takes time, however, until such new values and instruments are properly implemented and accepted.

In general, it can be observed that citizen science practitioners acknowledge the importance of external communication. However, the intensity, scope, and degree of professionalism vary between different projects. There are several factors that contribute to this situation. In academia, for example, external communication is not a top priority. Researchers often prefer to write a peer-reviewed article for a high-impact journal because it is more promising for their career. From this perspective, science communication is simply not relevant enough. As a result, project coordinators lack money, motivation, and time because they allocate those resources to different positions. Due to such prioritisation, many citizen science projects lack expertise and know-how in science communication.

It is important to reflect on the motives behind project communication. There may be a variety of reasons to reach out, such as to find participants, spread results, position a field, increase science literacy among the population, influence political opinion, or start a discussion. All of these reasons are legitimate. Reflecting on the reasons for communicating can make it easier to find the appropriate handbooks, tools, and partners.

Besides project or institutional websites, various platforms exist that provide visibility for citizen science projects in Switzerland. The → [CitSciHelvetia](#) biennial congress for citizen science in Switzerland provides space for ongoing initiatives to present themselves and brings together relevant actors. → [Schweiz forscht/Tous scientifiques](#) not only maintains a central website for all citizen science projects in Switzerland but it also

provides visibility through the social media and communication channels of → [Science et Cité](#), which is the competence centre for dialogue of the Swiss Academies of the Arts and Sciences and the location of the Office for Citizen Science in Switzerland.

Citizen Science Zurich's platform → [citizenscience.ch](#) provides visibility for ongoing projects initiated by researchers and citizens in Zurich as well as the rest of Switzerland. Citizen Science Zurich and Citizen Cyberlab host the Swiss hub of the Citizen Science Global Partnership (→ [CSGP](#)), which is a “network of networks” of citizen science researchers and practitioners that promotes and advances citizen science for a sustainable world. The Swiss CSGP hub provides projects and practitioners with an entry point to UN agencies and international organisations based in Switzerland and thus increases the visibility of citizen science among these actors.

Several international platforms offer visibility for projects that are not geographically limited to Switzerland, for example because they mainly occur in the digital space. → [SciScarter](#), → [Zooniverse](#), and → [eu-citizen.science](#) provide space and tools for attracting participants from all over the world.

4.1.3 Good Practice Examples and Suggestions

For practitioners, it can be difficult to obtain an overview of the countless guidelines for science communication. This section points out a few innovative approaches to suggest and illustrate what could work well for the external communication of citizen science projects. In general, it makes sense to follow good science communication theories by focusing on individuals and processes: citizen science has great stories to tell and the potential to broadly illustrate the diversity of actors who are interested in science and connected to it. Therefore, citizen science communication can be personal and approachable, and it can illustrate the various motivations of diverse individuals as well as the relevant and interesting results the approach generates. Citizen science also provides hands-on experience with and examples of understanding scientific processes.

The project → [Val d'Hérens 1950/2050](#) about the lives, images, and practices of a changing region aims to unite participatory research, scientific mediation, and an artistic approach. It invites citizens to reflect on the evo-

lution of their region in the context of climate change and both ecological and digital transitions. The project is exemplary in how it interweaves outreach and research activities. Since the project's inception, the research departments involved have collaborated closely with the Service Culture et Médiation scientifique at the University of Lausanne's Science and Society Laboratory (L'éprouvette). This close collaboration ensures the smooth operation of the project's various participatory activities, which have included approximately a dozen **in-person community events**.

Another strategy for drawing the attention of a broad public is the **smart use of the unexpected**. The project Beweisstück Unterhose (Piece of evidence: underpants), a collaboration between Agroscope, the University of Zurich, and catta, used cotton underpants buried in people's gardens to research soil composition. A daily object like this facilitates external project communication because it makes it more memorable. The same is true when projects **use simple language**. A catchy title serves particularly well to draw attention, speak directly to potential participants (→ [Tell us!](#)), or raise curiosity (→ [3-2-1 heiss!](#)).

Involving citizen scientists in external communication is especially effective because it shows the faces behind projects and allows people to identify with participants. The → [Swiss Multiple Sclerosis Registry](#), for example, regularly → [receives attention](#) for using this approach. The → [Swiss Litter Report](#) is a good example of how to make sure the relevant policy actors take notice of a project. **Having strong partners** helps to increase the visibility of any project and ensure that the outputs and results reach the target audience.

An inspiring example of creative citizen science is Deck 50 at the Natural History Museum in Vienna. → [Deck 50](#) is a room that “invites visitors of all ages to playfully explore connections between research and contemporary issues in society and allows inspiring insights into the world of science”. Deck 50 illustrates nicely that a **physical space** is not only a place to practice and discuss citizen science, but that it can also be an inspiring means of communicating. Permanent physical spaces dedicated to citizen science and similar activities have great potential to anchor citizen science in the public consciousness. They provide long-term visibility, not only on-site through special showcases, events, or workshops but also in public agendas or through regu-

lar coverage in the local media. Such venues can create an environment that fosters a culture of participation in science. Moreover, they are useful for building communities beyond individual research projects and help people identify as participants in science. For example, they can host citizen science clubs based on their topic of interest that meet on a regular basis, similar to reading circles or other interest groups.

Science Communication Tools

- > The Horizon 2020 project → [Quality and Effectiveness in Science and Technology communication \(QUEST\)](#) works together with journalists, museums, scientists, and social media content managers. They have created a range of tools and resources to help science communicators improve the effectiveness of their communication activities.
- > Science et Cité's → [SciComm Courses CH](#) is a collection of courses offered in Switzerland and contains useful filters (such as degree of participation). It is also available as an app.
- > The Swiss National Science Foundation offers → [media courses for researchers](#). These courses give researchers an opportunity to prepare and practise their appearances on TV, radio, in the press, or on social media under the guidance of media professionals and coaches.
- > In → [Kommunikation und Feedback](#), mit:forschen! provides a summary of the most important points to consider when communicating in and out of citizen science projects. It also includes a collection of tools and texts.

4.2 Goals and Measures

The following table summarises key aspects and goals regarding communication about citizen science in Switzerland. In addition, it provides concrete examples of measures and specifies which actor group(s) might implement each measure. Efforts to increase the value of science communication in research assessment must be intensified. Citizen science will profit from these efforts because communication is an integral part of it. Various opportunities exist for reaching a greater public via specific target groups in order to increase the visibility of citizen science among policymakers and the general public.

Goals	Concrete Measures	Actors (see I.III)
Increase the value of science communication in relation to peer-reviewed publishing and create incentives for researchers to engage with the public.	Implement reformed research assessments to consider a broader range of publications and activities, such as CoARA's → Agreement on Reforming Research Assessment .	<ul style="list-style-type: none"> > Funding agencies > Higher education institutions
Establish a regular platform that provides visibility for citizen science in Switzerland.	Institutionalise the Swiss citizen science conference CitSciHelvetia so that it can take place on a regular basis like, for example, the → Forum Citizen Science , the → Austrian Citizen Science Conference (OECSK) , and the → European Citizen Science Association's (ECSA's) conference . Include a format that addresses the public and allows citizens take part (consider cost).	<ul style="list-style-type: none"> > Ad hoc working group > Coordination point
	Create a national → prize or grant.	<ul style="list-style-type: none"> > Ad hoc working group
Expand the reach when communicating about projects that increase the visibility of citizen science in general.	Communicate through relays, for example clubs, associations, and NGOs.	<ul style="list-style-type: none"> > Citizen science practitioners
	Make use of local media as well as association journals (such as → Schweizer Bauer , → Naturfreund , or the magazines from Migros and Coop).	<ul style="list-style-type: none"> > Citizen science practitioners
	Include citizen scientists in the communication process.	<ul style="list-style-type: none"> > Citizen science practitioners
	Take advantage of national and international platforms such as → Schweiz forscht , → eu-citizen.science , → SciStarter , and → Zooniverse .	<ul style="list-style-type: none"> > Citizen science practitioners
Communicate effectively by choosing the content and communication channel(s) best suited for a certain audience as well as the most appropriate language.	Expand and coordinate training opportunities for science communication.	<ul style="list-style-type: none"> > Coordination point > Higher education institutions > Non-academic institutions
	Cooperate with science communication specialists (e.g. museums and HEIs).	<ul style="list-style-type: none"> > Citizen science practitioners
Maintain flexibility in order to be able to adapt the research process and communication quickly and when circumstances change because they are strongly intertwined.	Consider communication (and how to fund it) from project inception.	<ul style="list-style-type: none"> > Citizen science practitioners
	Agree on values (such as openness, flexibility, etc.) in citizen science communication.	<ul style="list-style-type: none"> > Ad hoc working group

Widely communicate the scientific and added value of citizen science.	Use various kinds of media to communicate the added value and impact of citizen science (as defined in Chapter 1). Provide a collection of research on the scientific value and quality of citizen science.	<ul style="list-style-type: none"> > Citizen science practitioners > Coordination point
Coordinate various activities around citizen science occurring in Switzerland.	Each institution that practices citizen science designates an “ambassador” to serve as the node between the public, internal citizen science researchers, and external citizen science actors. Promote colleagues' projects and the activities of the various citizen science actors via social media and other channels.	<ul style="list-style-type: none"> > Higher education institutions > Non-academic institutions > Citizen science practitioners

Conclusion

Citizen science in Switzerland has made significant progress in recent years. In order to further advance the approach, this report has defined goals, identified action points, and suggested concrete measures to be implemented in the areas of added value and impact, funding, training, and communication and visibility. By implementing these measures, all of the different groups of actors defined in Section I.III of the Introduction – citizen science practitioners, higher education institutions, non-academic institutions, ad hoc working groups, coordination points, and funding agencies – can help to promote citizen science. This conclusion categorises all of the previously mentioned goals and measures according to the corresponding groups of actors.

Citizen Science Practitioners

Citizen science practitioners are at the heart of citizen science. They are the ones who design and apply for new projects, implement and evaluate them, and communicate their results. Hence, they occupy a special role among the different groups of actors. Since they work directly on projects, they are in the best position to make the added value of citizen science visible. When doing this, it is important that they communicate to different audiences using a wide array of media and communication strategies. And in order to do this properly, citizen science practitioners need adequate resources (time and money) and support (professional and human resources). In addition, citizen science practitioners are encouraged to be creative when procuring funding for new projects and positions in order to account for the unique nature of citizen science. Specific measures that citizen science practitioners can take to reach these goals are summarised in the table below.

Goals	Concrete Measures	Chapter
Make the added value of citizen science visible.	Plan the evaluation of outcomes and impact from the onset of a project onwards. Include all involved partners in this process.	Added Value
	Present projects in an impact-oriented manner. Include all involved partners in this process.	
	Make outcomes and impact visible via specific platforms and/or analogue formats of knowledge exchange such as exhibitions.	
Expand the options for citizen science funding.	Look for topic-specific funding (instead of funding that specifically targets citizen science) and for funding that is not specifically earmarked for research.	Funding
	Apply for money from different sources for different posts (e.g. communication, research, and events).	
Expand the reach when communicating about projects that increase the visibility of citizen science in general.	Communicate through relays, for example clubs, associations, and NGOs.	Communication and Visibility
	Make use of local media as well as association journals (such as → Schweizer Bauer , → Naturfreund , or the magazines from Coop and Migros).	
	Include citizen scientists in the communication process.	
Communicate effectively by choosing the content and communication channel(s) best suited for a certain audience as well as the most appropriate language.	Take advantage of national and international platforms such as → Schweiz forscht , → eu-citizen.science , → SciStarter , and → Zooniverse .	
	Cooperate with science communication specialists (e.g. museums and HEIs).	

Maintain flexibility in order to be able to adapt the research process and communication quickly and when circumstances change because they are strongly intertwined.	Consider communication (and how to fund it) from project inception.
Widely communicate the scientific and added value of citizen science.	Use various kinds of media to communicate the added value and impact of citizen science (as defined in Chapter 1).
Coordinate various activities around citizen science occurring in Switzerland.	Promote colleagues' projects and the activities of the various citizen science actors via social media and other channels.

Higher Education Institutions

Higher education institutions are central players in (professional) science given their double role of conducting research and training students. As such, they are in a prime position to support the development of the citizen science community in Switzerland. They can do this not only by offering training for citizen science practitioners but also by promoting the concept of citizen science among students and academics. Moreover, they can foster citizen science by acknowledging its specific nature in terms of employment structures and research assessments. Specific measures that can be taken by higher education institutions are summarised in the table below.

Goals	Concrete Measures	Chapter
Make the added value of citizen science visible.	Create and coordinate training opportunities so that citizen science practitioners can name outcomes and impact.	Added Value
Make employment structures more favourable for citizen science projects to have an impact.	Create long-term positions, for example for experts in participation or community involvement. Diversify academic job roles to include positions for outreach, engagement, community management, and participatory policy.	
Establish citizen science projects and programmes with a time horizon that is long enough for societal impacts to materialise.	Establish citizen science on a strategic level (for example as its own organisational unit, like at → UZH/ETH, → UNIGE, and → UNIL, or in connection with open science, like at the → Bern University of Applied Sciences).	
Ensure that research assessments account for the specific characteristics and added value of citizen science.	Fund long-term research programmes, ideally as cooperative endeavours among various actors and structures (e.g. the SNSF's National Research Programme (NRP) 82 on biodiversity) in order to allow the impact to materialise and be measured. Implement assessments that already go in this direction such as the → Reforming Research Assessment and the San Francisco Declaration on Research Assessment (→ DORA).	
Acknowledge that citizen science, like other forms of research involving non-academic actors, is a rather new set of methodologies, it often works with innovative and new concepts (such as living labs, empowerment, co-production, social change, social relevance, distributed innovation, and distributed expertise), and it is constantly evolving. Failure is recognised as part of the learning process.	Offer seed money – an easily available, small amount of initial funding that helps to build the foundation of a larger project. Examples of seed funding include → UNIL's Centre interdisciplinaire de recherche sur la montagne, → CSZ's Seed Grants, and the preparatory grant within the → SNSF's NRP 82.	Funding

Align funding schemes with the needs of citizen science projects to account for the intricacies of citizen science and the unique requirements it entails.	Fund long-term positions to ensure the quality and continuity of citizen science projects and/or to fund what comes after the project, for example through the “third sector of research” (as done in → France with the → Tiers-Lieux programme).	
Offer training for citizen science practitioners.	Increase higher education teaching opportunities for citizen science and the competencies it requires, and make those offers more visible and accessible (within and outside the institution as well as for citizens).	Training
Spark interest in citizen science among students/academics.	Develop and include an introduction to citizen science that can be included in the basic curriculum of various disciplines (e.g. through a short introductory video shown in methodological lectures).	
Offer training for students/academics.	Develop courses that span departments.	
Increase the diversity of those providing citizen science training.	Recognise trainers from outside of academia.	
Create an awareness among funders, research managers, and researchers that the success of citizen science depends on the competencies of citizen science researchers, and create corresponding training opportunities.	Offer training not only in science communication but also in participatory approaches, community management, etc. Consider a course that combines these issues, for example under the umbrella “public engagement”, as is done in anglophone countries.	
Increase the value of science communication in relation to peer-reviewed publishing and create incentives for researchers to engage with the public.	Implement reformed research assessments to consider a broader range of publications and activities, such as CoARA's → Agreement on Reforming Research Assessment.	Communication and Visibility
Communicate effectively by choosing the content and communication channel(s) best suited for a certain audience as well as the most appropriate language.	Expand and coordinate training opportunities for science communication.	
Coordinate various activities around citizen science occurring in Switzerland.	Each institution that practices citizen science designates an “ambassador” to serve as the node between the public, internal citizen science researchers, and external citizen science actors.	

Non-academic Institutions

Non-academic citizen science institutions stand out through their hands-on experience in conducting citizen science projects. Passing on their knowledge gained in such projects makes them prime candidates for offering training to citizen science practitioners. At the same time, they can help coordinate and build the citizen science community in Switzerland. To do so, they need to create employment structures that enable long-term engagement with citizen science and the strategic incorporation of citizen science. Specific measures to achieve these goals are presented in the table below.

Goals	Concrete Measures	Chapter
Make the added value of citizen science visible.	Create and coordinate training opportunities so that citizen science practitioners can name outcomes and impact.	Added Value
Establish citizen science projects and programmes with a time horizon that is long enough for societal impacts to materialise.	Fund long-term research programmes, ideally as cooperative endeavours among various actors and structures (e.g. the SNSF's National Research Programme (NRP) 82 on biodiversity) in order to allow the impact to materialise and be measured.	
Make employment structures more favourable for citizen science projects to have an impact.	Create long-term positions, for example for experts in participation or community involvement. Establish citizen science on a strategic level.	
Align funding schemes with the needs of citizen science projects to account for the intricacies of citizen science and the unique requirements it entails.	Fund long-term positions to ensure the quality and continuity of citizen science projects and/or to fund what comes after the project, for example through the "third sector of research" (as done in → France with the → Tiers-Lieux programme).	Funding
Offer training for citizen science practitioners.	Offer hands-on workshops.	Training
Communicate effectively by choosing the content and communication channel(s) best suited for a certain audience as well as the most appropriate language.	Expand and coordinate training opportunities for science communication.	Communication and Visibility
Coordinate various activities around citizen science occurring in Switzerland.	Each institution that practices citizen science designates an "ambassador" to serve as the node between the public, internal citizen science researchers, and external citizen science actors.	

Ad hoc Working Groups

Numerous measures proposed in this report require the establishment of working groups that define standards and details, which often collaborate or consult with other groups of actors. Such ad hoc working groups may be formed anew for each measure or may tackle several measures at once. Working groups should consist of interested members from the citizen science community who collaborate to advance specific goals by producing guidelines or roadmaps for specific measures. One main goal is to agree on which values and competencies are necessary to carry out citizen science and which of them are needed to communicate its value. Another priority is to create and/or coordinate training opportunities for citizen science practitioners and students in order to spark interest in the approach. Finally, ad hoc working groups should ensure that a variety of citizen science stakeholders can participate in redefining research assessments.

Goals	Concrete Measures	Chapter
Make the added value of citizen science visible.	Create and coordinate training opportunities so that citizen science practitioners can name outcomes and impact.	Added Value
Ensure that research assessments account for the specific characteristics and added value of citizen science.	Reconsider research assessments so that they value citizen and community involvement, social exchange, outreach, local impact, and similar processes.	
Acknowledge the challenge of writing a grant proposal for citizen science projects, which are characterised by an iterative process that is often difficult to predict and may require unplanned adaptations.	Develop and offer training (for academics and non-academics) on how to write a smart and original funding application, for example with a checklist (similar to what → vitaminB , → Fundraisio , → benevol , and other organisations offer).	Funding
Offer training for citizen science practitioners.	Develop a citizen science training programme (e.g. a Certificate of Advanced Studies (CAS) programme, a summer school, or a massive open online course (MOOC)) that can be offered by different institutions in Switzerland. Ideally, this should not only cover citizen science but also be combined with other participatory approaches.	Training
Spark interest in citizen science among students/academics.	Develop and include an introduction to citizen science that can be included in the basic curriculum of various disciplines (e.g. through a short introductory video shown in methodological lectures).	
Create an overview of or agreement on which competencies are necessary for researchers when preparing and implementing a citizen science project (e.g. guided by the → 10 Swiss Citizen Science Principles).	Identify competencies needed for citizen science that are beneficial for all researchers (outreach, science communication, etc.), and include training for these competencies in general academic curricula.	
Create an awareness among funders, research managers, and researchers that the success of citizen science depends on the competencies of citizen science researchers, and create corresponding training opportunities.	Offer training not only in science communication but also in participatory approaches, community management, etc. Consider a course that combines these issues, for example under the umbrella “public engagement”, as is done in anglophone countries.	

Establish a regular platform that provides visibility for citizen science in Switzerland.	Institutionalise the Swiss citizen science conference CitSciHelvetia so that it can take place on a regular basis like, for example, the → Forum Citizen Science , the → Austrian Citizen Science Conference (OECSK) , and the → European Citizen Science Association's (ECSA's) conference . Include a format that addresses the public and allows citizens take part (consider cost). Create a national → prize or grant.	Communication and Visibility
Maintain flexibility in order to be able to adapt the research process and communication quickly and when circumstances change because they are strongly intertwined.	Agree on values (such as openness, flexibility, etc.) in citizen science communication.	

Coordination Points

Some measures proposed in this report primarily require coordination work to collect and update issues and opportunities around and for citizen science in Switzerland. These might be done by individuals or institutions that, for example, maintain platforms to increase the visibility of citizen science in general and of specific aspects, such as its added value or training opportunities. In addition, such coordination points can set themes and advance important issues.

Goals	Concrete Measures	Chapter
Make the added value of citizen science visible.	Make outcomes and impacts visible via specific platforms and/or analogue formats of knowledge exchange such as exhibitions.	Added Value
Expand the options for citizen science funding.	Provide an overview of possible funding institutions (similar to, e.g., the → Foundation Registry).	Funding
Enable researchers and practitioners to stay updated on frequently changing funding conditions and formalities.	Ensure transparency in specific calls and their criteria, for example by publicly disclosing them or establishing regular informational events to keep researchers and practitioners informed.	
Give citizen science practitioners an overview of the courses and training available in Switzerland.	Set up an "ambassador's network" among higher education institutions and other citizen science training organisations to coordinate efforts. Establish a living document with teaching opportunities for citizen science in Switzerland that focuses on the characteristics of courses rather than institutional differences.	Training
Establish a regular platform that provides visibility for citizen science in Switzerland.	Institutionalise the Swiss citizen science conference CitSciHelvetia so that it can take place on a regular basis like, for example, the → Forum Citizen Science , the → Austrian Citizen Science Conference (OECSK) , and the → European Citizen Science Association's (ECSA's) conference . Include a format that addresses the public and allows citizens take part (consider cost).	Communication and Visibility
Communicate effectively by choosing the content and communication channel(s) best suited for a certain audience as well as the most appropriate language.	Expand and coordinate training opportunities for science communication.	
Widely communicate the scientific and added value of citizen science.	Provide a collection of research on the scientific value and quality of citizen science.	

Funding Agencies

Through their guidelines and rules, funding institutions have a significant impact on what kinds of projects are realised and how they are framed and executed. Hence, funding policies have immense potential to make more citizen science possible. Important forms of leverage are their abilities to adapt the criteria used to measure scientific excellence and to acknowledge the added value of citizen science in science as well as in practice. By supporting citizen science projects, funding agencies can enable the discovery of scientific findings that would not be possible otherwise and they take a step towards creating a fruitful dialogue between science and society. Below is a summary of the specific measures that funding agencies can take to reach these goals.

Goals	Concrete Measures	Chapter
Establish citizen science projects and programmes with a time horizon that is long enough for societal impacts to materialise.	<p>Support citizen science institutions that have long-term structures, such as parks, museums, libraries, and associations.</p> <p>Fund long-term research programmes, ideally as cooperative endeavours among various actors and structures (e.g. the SNSF's National Research Programme (NRP) 82 on biodiversity) in order to allow the impact to materialise and be measured.</p>	Added Value
Ensure that research assessments account for the specific characteristics and added value of citizen science.	<p>Reconsider research assessments so that they value citizen and community involvement, social exchange, outreach, local impact, and similar processes.</p> <p>Implement assessments that already go in this direction such as the → Reforming Research Assessment and the San Francisco Declaration on Research Assessment (→ DORA).</p> <p>Make sure to select suitable reviewers, i.e. citizen science practitioners for citizen science projects.</p> <p>Engage non-academic evaluators, for instance when it comes to the feasibility of a project's non-scientific ambitions (as proposed by → technopolis).</p>	
Align funding schemes with the needs of citizen science projects to account for the intricacies of citizen science and the unique requirements it entails.	<p>Carefully select the reviewers for citizen science projects and ensure they are experts in citizen science.</p> <p>Introduce a review process that enables discussions among reviewers.</p> <p>Allow non-academic actors to apply for funding, as → Horizon Europe currently does.</p> <p>Fund long-term positions to ensure the quality and continuity of citizen science projects and/or to fund what comes after the project, for example through the "third sector of research" (as done in → France with the → Tiers-Lieux programme).</p>	Funding
Acknowledge that citizen science, like other forms of research involving non-academic actors, is a rather new set of methodologies, it often works with innovative and new concepts (such as living labs, empowerment, co-production, social change, social relevance, distributed innovation, and distributed expertise), and it is constantly evolving. Failure is recognised as part of the learning process.	<p>Offer seed money – an easily available, small amount of initial funding that helps to build the foundation of a larger project. Examples of seed funding include → UNIL's Centre interdisciplinaire de recherche sur la montagne, → CSZ's Seed Grants, and the preparatory grant within the → SNSF's NRP 82.</p> <p>Create new and appropriate evaluation and impact criteria. For example, use the criteria that the research group as a whole has the necessary expertise and skills to run a citizen science project rigorously and competently (e.g. guided by the → 10 Swiss Citizen Science Principles, as practiced by the → Hans Sauer Stiftung) and that partners are involved in the elaboration of the research design and problematisation when relevant.</p> <p>Encourage research on citizen science (e.g. methodology, ethics, budget needs, training, volunteer management, added value, community building, diversity, and inclusion).</p>	

Enable researchers and practitioners to stay updated on frequently changing funding conditions and formalities.	Ensure transparency in specific calls and their criteria, for example by publicly disclosing them or establishing regular informational events to keep researchers and practitioners informed.	
Create an awareness among funders, research managers, and researchers that the success of citizen science depends on the competencies of citizen science researchers, and create corresponding training opportunities.	Offer training not only in science communication but also in participatory approaches, community management, etc.	Training
Increase the value of science communication in relation to peer-reviewed publishing and create incentives for researchers to engage with the public.	Implement reformed research assessments to consider a broader range of publications and activities, such as CoARA's → Agreement on Reforming Research Assessment .	Communication and Visibility

Annex

Methodology of This Report

In order to compile this report in a participatory manner and to include various perspectives, Science et Cité formed an expert group in early 2022. This group consists of representatives of citizen science and related fields (action research, transformative science, and transdisciplinary research) as well as representatives of funding agencies and the Swiss Academies of Arts and Sciences. By March 2022, an in-depth, semi-structured interview had been conducted with each member of the expert group. Seven additional citizen science experts and practitioners were also interviewed. The expert group then defined ten thematic fields in which they saw a need for action and/or for analysis. In summer 2022, the expert group decided to focus on the four topics covered in this report because they are the most pressing topics, the topics in which the experts felt most competent, and the most suitable topics to be addressed in the form of such a report. The expert group worked with Google Docs and met for several workshops to collect ideas and data, sharpen arguments, and agree on the most important points.

In March 2023, a workshop was held at the CitSci-Helvetia'23 conference in order to involve the community of practitioners and solicit feedback on a draft of the report. Their valuable comments were incorporated into the report. In February 2024, approximately 35 citizen science stakeholders and experts were invited to review this report; 25 of them provided answers in varying detail. We are very grateful that they enriched the report with their unique perspectives.

Please note that this report is not a scientific paper. A pragmatic approach was used, and the expert group is aware that some terms may not be scientifically precise but rather pragmatically correct. As many examples as possible were included to illustrate the points made in the report. This approach made it possible to not only illustrate the diversity of citizen science in Switzerland but also provide some visibility to projects. The expert group is fully aware that, in some places, the examples may seem arbitrary.

10 Swiss Citizen Science Principles

→ 10 Swiss Citizen Science Principles

10 SWISS CITIZEN SCIENCE PRINCIPLES

MARCH 2022

INTRODUCTION

«Citizen Science» (CS) refers to a scientific methodology enabling citizen scientists and academic scientists to interact and produce scientific knowledge.¹ Citizen Science can be adapted to and applied within diverse situations, practices and scientific disciplines (i.e. Humanities and Social Sciences, Medical Sciences, Natural Sciences and Engineering Sciences). Citizen Science is part of good scientific practice and culture and adds value to research and society. It has the potential to strengthen mutual learning between all CS-stakeholders.

As part of the Citizen Science Initiative of the Swiss Academies 2021-24 (ICSA+), The Swiss Academies of Arts and Sciences, Science et Cité (Swiss Citizen Science Network «Schweiz forscht»), the Participatory Science Academy and Citizen Science Center Zurich in conjunction with the Citizen Cyberlab Geneva have developed a proposal for CS-Principles for Switzerland to provide common ground and orientation for the Swiss-CS-Community. Important feedback from the CS community was collected and integrated thanks to a national online consultation. The following principles are intended to serve as guidelines for all CS-stakeholders. Anybody interested or involved in Citizen Science projects are invited to consider these principles. The Swiss-CS-Principles may be adapted and modified according to the future needs and developments of the Swiss-CS-Community.

The Swiss-CS-Principles proposal is based on the following documents: 1. The [10 Principles of Citizen Science](#) (2015) by the European Citizen Science Association (ECSA)² 2. the [Code of conduct for scientific integrity](#) (2021) by the Swiss Academies of Art and Sciences.³

FUNDAMENTALS

CS follows ethical scientific behavior resting on the basic principles of reliability, honesty, respect, and accountability. CS projects should be designed, undertaken, analyzed, documented, and disseminated with care and with the awareness of their responsibility to society, the environment, and nature. For more detailed information, please consult the [code of conduct for scientific integrity](#). Project leaders should proactively consider and mitigate possible harms and risks, take appropriate precautionary measures as well as consider possible uses in connection with their research work (e.g. how the data collected can be reused or leveraged for other purposes).

¹ **Glossary** (formulated by the Swiss-CS-Principles working group)

Citizen Science (CS): various definitions on CS exist, the [Swiss Citizen Science Platform Schweiz forscht](#) provides an overview of these definitions. In general, CS refers to a scientific methodology enabling citizen scientists and academic scientists to interact and produce scientific knowledge. CS can be adapted and applied within diverse situations, practices, and scientific disciplines. Based by [Swiss Science and Innovation Council \(SSIC\) 2017: Citizen Science. An Introduction](#): p.22.; [SSIC 2018: Citizen Science Expertise, Demokratie und öffentliche Partizipation](#) p.30.

Citizen scientists: citizen enthusiasts, interested in a scientific field and involved in a CS project.

Academic scientists: academic researchers involved in a CS project (n.b. an academic scientist can be a citizen scientist when joining a CS project not belonging to their original field of research).

Citizen Science project team: citizen scientists and academic scientists working together.

Citizen Science stakeholders: academic scientists, citizen scientists, funding and implementing organizations (such as local or regional authorities, concerned communities and/or NGOs).

Citizen Science projects: CS projects pursue a scientific question and gain scientific knowledge.

² ECSA (European Citizen Science Association). 2015. Ten Principles of Citizen Science. Berlin. <http://doi.org/10.17605/OSF.IO/XPR2N>

³ Swiss Academies of Arts and Sciences (2021): Code of conduct for scientific integrity. go.swiss-academies.ch/integrity. <http://doi.org/10.5281/zenodo.4707560>

10 SWISS CITIZEN SCIENCE PRINCIPLES

PRINCIPLE 1

CONDITIONS

Citizen science (CS) projects exist thanks to the initiative or active involvement of citizen scientists in scientific projects.

PRINCIPLE 2

GOAL

Citizen science projects generate scientific knowledge and enable exchange as well as better societal and scientific understanding among all CS stakeholders.

Citizen science projects may also address local, national, and international issues, develop research methods, set up systematic data collection and analysis, as well as provide the public and policymakers with relevant insights.

PRINCIPLE 3

ADDED VALUE

Citizen science projects provide an added value to both the citizen scientists and the academic scientists.

This includes mutual learning opportunities between project team members (dialogue, societal exchange, organizational skills), capacity building, personal enrichment, satisfaction through contributing to scientific evidence.

PRINCIPLE 4

PARTICIPATION LEVEL

Citizen scientists are encouraged to collaborate and co-create with academic scientists in all phases of the scientific process.

The participation level is explicit for all project team members before the project starts. It may include initiating and developing the research question, designing the method, gathering, analyzing, managing, interpreting, and sharing data, communicating the results, and acting in the project governance.

PRINCIPLE 5

COMMUNICATION

Exact expectations from and towards all project team members as well as the project workflow are clearly communicated within the project team (participation level, scientific methods, use of data, research outcomes, authorship, etc). The different interest groups are addressed accordingly.

PRINCIPLE 6

RESEARCH METHOD AND CONTROL

Citizen science is a scientific approach like any other with limitations and biases that should be considered and controlled for. It differentiates itself from others as all project participants have a shared responsibility for the integrity of the research.

PRINCIPLE 7

DATA, PUBLICATION AND SECURITY

To the extent possible, and where it does not raise privacy issues, citizen science project data and meta-data are made publicly accessible, and results are published in an open access format (Open Science⁴ principle). Data should comply with the FAIR⁵ principles and the Swiss legislation on data protection. All people involved in CS projects commit to objectivity and confidentiality as well as to the disclosure of any conflicts of interest. All project stakeholders are normally informed and consulted before the project starts about all the possible publication formats for the research findings (including social networks and non-traditional publication formats) as well as the procedures for submission and revision. Data sharing may occur during or after the project.

PRINCIPLE 8

EVALUATION

Citizen science projects are evaluated based on several interconnected aspects including scientific output, data quality, participant experience, diversity, intensity, and quality of collaboration as well as wider societal or policy impact. Evaluation aspects are determined within the project teams before and during the project. The results of the evaluation are used to improve future projects and made available to interested parties as far as possible. The evaluation may be carried out internally within the project team or with the help of outside experts. The evaluation format varies from a common debriefing to an extended survey, depending on the project capacities and funding.

PRINCIPLE 9

CONTRIBUTION

Any contributions (financial contributions, volunteering, providing personal infrastructure and equipment, etc) and its origin should be transparent and clearly documented.

PRINCIPLE 10

ACKNOWLEDGMENT

Both academic scientists and citizen scientists are acknowledged in a form appropriate to their participation in the project. This may for example take the form of co-authorship, acknowledgement in publications, certificates of achievement, financial remuneration or expenses compensation, joint design and hosting of events that are part of the project, or other forms.

⁴ Open Science : Open Science is the practice of science in such a way that others can collaborate and contribute, where research data, lab notes and other research processes are freely available, under terms that enable reuse, redistribution and reproduction of the research and its underlying data and methods. - by Fosteropen science.eu. 15.02.2022

⁵ FAIR = findable, accessible, interoperable, and reusable.

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