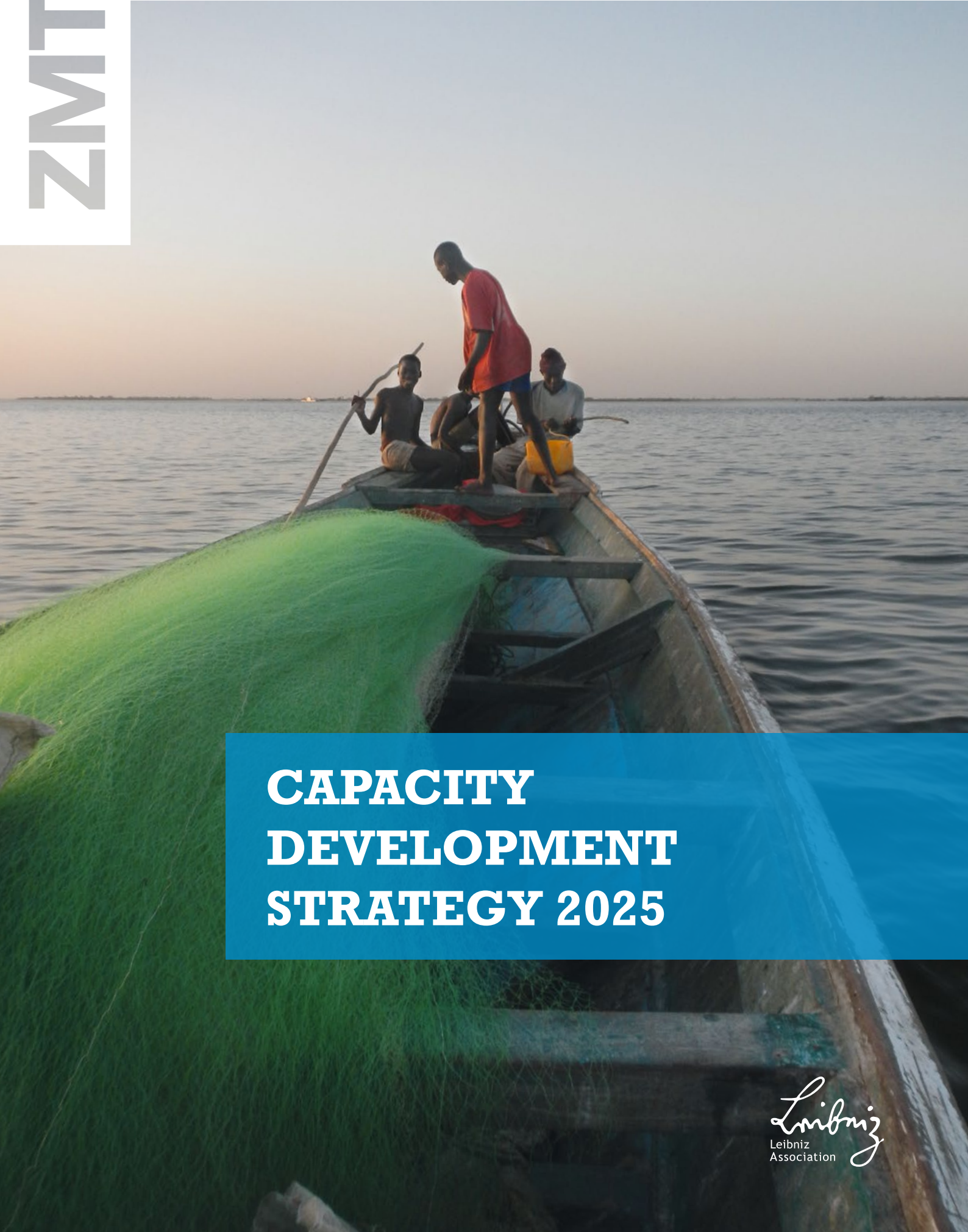




ZMT

LEIBNIZ CENTRE  
for Tropical Marine Research



**CAPACITY  
DEVELOPMENT  
STRATEGY 2025**

# ZMT Capacity Development Strategy 2025

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## Executive Summary

Following the mission of ZMT to provide a scientific basis for the sustainable management of tropical coastal ecosystems, we are deeply convinced that the internalisation and application of sustainability principles in management are connected intimately with a thorough and holistic Capacity Development (CD) at all societal levels. ZMT is contributing to this by strengthening academia in tropical, mainly developing countries putting special emphasis on the empowerment of women.

Sustainable management of their own resources requires a strong effort in tropical coastal countries to build human and infrastructure capacity, that in most cases cannot be generated out of traditional structures. CD therefore means to help creating an academic and research environment that in the future is capable to reproduce and maintain itself, stimulate new developments and changes on the national level, and prepare institutions and people to participate actively in an international context.

We are convinced that the best way to achieve the goal of educating responsibly and holistically thinking and acting researchers is the combination of adequate training within scientific projects (*Theoria cum Praxi*), our leitmotif since the foundation of ZMT.

ZMT has been active for more than 25 years in training and education of master students in tropical marine ecology research and related disciplines, in guiding doctoral candidates towards careers in the field of ecological science or management, training-on-the-job of technical staff, and advanced training of young postdoc scientists through special courses and fellowships.

During the last 25 years, ZMT has trained almost 400 master students (of those some 260 in its special master program) and 160 doctoral students. More than 600 ZMT alumni have registered in our database, and special effort is being undertaken to enhance the use of this strong network for developing further cooperations and projects. A significant number of graduates of our training programs has reached influential positions at universities and research institutions (487 persons, of those 26 professors), in ministries (17) and governmental departments (26), NGOs (24), consultancies (14), education (eight), and UN agencies (three). We consider these alumni as multipliers of the principles of ZMT for sustainable development and cooperation in and with tropical coastal countries.

ZMT aims to continue and further develop this understanding of CD and strives for intensifying its activities at all levels, individual, organisational, and societal. The development of new tools for distributing information (e.g. Massive Open Online Courses = MOOCS, e-learning, policy briefs), involvement of society in research (citizen science), and creating ownership in communities (open access, open data) will be used to create a new era of knowledge exchange between science, organisations and society.

## Mission of ZMT

The mission of ZMT is to provide a scientific basis for the protection and sustainable use of tropical coastal ecosystems. In addition to advanced and cutting edge research, a main means to fulfil this mission is a strong engagement in CD on individual, organisational and societal level. Therefore ZMT's vision statement in the field of CD is:

**Through international cooperation, implementing the adequate CD measures, and following its partnership ethics ("Bremen Criteria"), the ZMT assists its partners in tropical countries in building up their own human and infrastructure capacities to address sustainability issues, saving their resources and developing their livelihoods.**

This contributes amongst others to the implementation of the UN Sustainable Development Goals, specifically Goal 14 'Life Below Water', as well as the Paris Agreement on Climate Protection, and is in line with global engagement and definition of CD as a **"Process by which people, organizations and society systematically stimulate and develop their capacities over time to achieve social and economic goals"**<sup>1</sup> by UN organisations related to the ocean, e.g. IOC-UNESCO or UNDP (LME).

ZMT in addition addresses strongly the achievement of ecological goals. In its capacity development activities it focuses mainly on academic CD, strengthening and multiplying the abilities of partners to conduct high-level academic research, to build up their own human capital, to improve data accessibility, and to make better use of the available data. This is achieved by educating, training and mentoring young scientists, training of postgraduates and supporting south-south cooperation.

## Achievements and status quo

CD at ZMT covers a range of activities on the individual, the organisational and the societal level.

### Individual level:

Highest emphasis is put on the research-based academic **training of young scientists from master student level to young postdocs** from all over the world in an interdisciplinary research environment.

To address specific needs of expertise connected with the problems arising along tropical coasts and the management of their resources, ZMT has pioneered with the development of a tailor-shaped international and interdisciplinary training and education programme to allow for the joint education and training of German and international students in tropical marine research. These programs address the Master of Science and Master of Arts level (e.g., ISATEC - International Studies in Aquatic Tropical Ecology, implemented jointly with the Bremen University since 1999) and doctoral studies.

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<sup>1</sup> "Process by which people, organizations and society systematically stimulate and develop their capacities over time to achieve social and economic goals. It is a concept that extends the term of capacity building to encompass all aspects of creating and sustaining capacity growth over time. It involves learning and various types of training, but also continuous efforts to develop institutions, political awareness, financial resources, technology systems and the wider enabling environment" UNISDR (United Nations Office for Disaster Reduction)



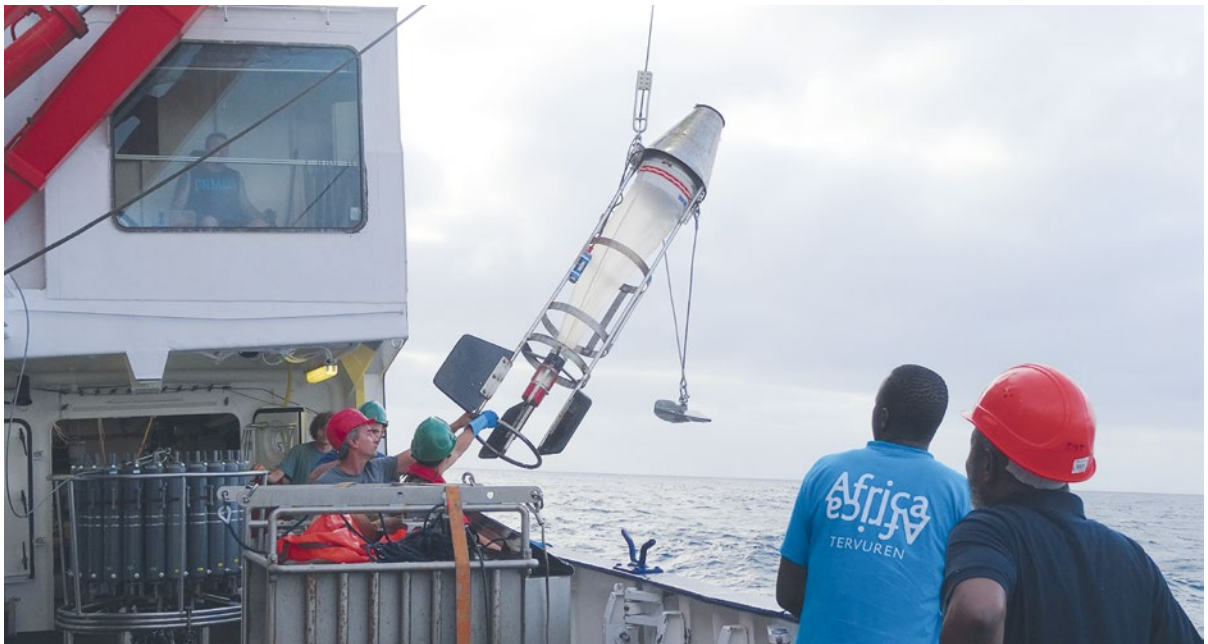


The aim of individual training is the familiarisation of candidates with research conditions in Germany as well as in tropical countries. This goal is reached by incorporating candidates in running research projects abroad and laboratory work at ZMT.

Experiences gained with the graduate school SUTAS (Sustainable Utilization of Tropical Aquatic Systems), funded by the Leibniz Association, have led to the development of a structured ZMT **Doctoral Programme**, coordinated by a doctoral studies circle comprised of representatives of all status groups of ZMT to guarantee the highest benefit and a long-term strategic planning of the doctoral studies at ZMT. The cooperation with other doctoral programs of universities in the Bremen region is essential to achieve our goals.

Another instrument in the CD strategy of ZMT is **the secondment of experienced ZMT scientists to partner institutes** to be incorporated into their training activities (e.g lectures, short courses, summer schools, training-on-the-job etc.). Cooperation projects like European COST Actions, European Training Networks (ETNs), and ship-based research cruises, provide ample opportunity for young scientists to gain international experience and intercultural competence.





ZMT understands its role in CD as a hub for candidates and researchers from tropical countries. ZMT increasingly uses opportunities to host short-term and long-term **fellows funded by DAAD<sup>2</sup>, Leibniz-DAAD<sup>3</sup>, HWK<sup>4</sup>, UN-Nippon Foundation, AvH<sup>5</sup>, and the NAM S&T Centre<sup>6</sup>**, of which ZMT is a partner.

A strong instrument in its function as a hub is the **further development of ZMT's Alumni Network**. This currently comprises more than 600 alumni from over 56 countries. This network is strengthened continuously by means of alumni meetings and conferences at ZMT and in the tropics. The events lay their focus on networking between the alumni and ZMT as well as providing information on third party funding opportunities and specific training offers. Alumni Ambassadors represent ZMT in their home countries, offer advice and low-threshold contact of interested students and scientists with ZMT. ZMT is keeping track of its alumni to assess whether the CD activities need to be adapted or improved, and to strengthen the network in teaching and research institutions in the tropics.

### **Organisational level**

ZMT is prepared to transfer its scientific, technical and CD expertise into partner countries and organisations through the engagement of ZMT staff in teaching and training at partner institutes abroad. Moreover, ZMT contributes to the development of curricula at universities and research institutes in ZMT's partner countries, to the training of young scientists on the job, e.g., in seagoing expeditions and the use of modern laboratory instruments, thereby enhancing the institutional capacities and strengthening the cooperation with the partner institutes.

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<sup>2</sup> German Academic Exchange Service

<sup>3</sup> Specific DAAD postdoc program with the Leibniz Association

<sup>4</sup> Hanse Wissenschaftskolleg, a center for advanced studies

<sup>5</sup> Alexander von Humboldt Foundation

<sup>6</sup> Non Aligned Member States Science and Technology Center, based in India



On the national level, ZMT cooperates in research and CD with the University of Bremen, Jacobs University, University of Kiel, University of Hamburg, University of Oldenburg, University of Bonn, Thünen Institute for Sea Fisheries in Bremerhaven, Hochschule Bremerhaven, and others. Through these collaborations, the hub function of ZMT in national and international networks for CD in tropical marine research is further developed and expanded.

While the support for infrastructural development at partner institutions is not the focus of ZMT's CD strategy, the institute occasionally contributes here via larger integrated and multilateral research projects with international sponsors.

### **Societal level**

A particular duty of ZMT is to give advice to the Free Hanseatic City of Bremen and the Federal Government of Germany as well as its representatives on the level of the EU on issues of marine research, especially its development as well as on matters of scientific cooperation with countries in the tropics. ZMT engages in advising the BMBF in agenda setting for coastal and marine research via KDM and directly, offers regular discussions with scientists to the members of the Bremen Parliament, and invites political representatives to visits to ZMT and its projects in the tropics.

ZMT is unique in its multi- and interdisciplinary experience in the tropical belt. This expertise it shares with and is requested to provide to governmental bodies such as BMWi, AA, BMBF, German IOC, BfN, BMZ and institutions (e.g. EU, G7, IOC). ZMT is also approached by a range of countries to coordinate research activities because of its neutral position



and the mutual interest in sustainable research and development (e.g. Red Sea Program coordinated by ZMT).

The transfer of research results into societal fora and groups is seen as a prominent task of ZMT being an institution working at the forefront of transdisciplinary social-ecological research. The provision of expert scientific advice to the various stakeholders in the tropical coastal regions is in the core of ZMT's advice activities.

The creation of the **Office for Knowledge Exchange (OKE)** of ZMT mirrors this development. The OKE supports the issuing of Policy Briefs prepared jointly by ZMT and partner institutions, the organisation of discussion fora with politicians, the involvement of the ZMT alumni network to identify topical policy-relevant fields for research and CD, and consultancies for the private sector.

OKE organises and supports cooperative projects for awareness and skill raising with development organisations, such as the Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ).

## Future Development

With the advancement of the institute over the last years and as a consequence of the admission to the Leibniz Association, ZMT is now well prepared to further develop inter- and transdisciplinary research in its projects, and transfer results into a holistically directed training of our students and young scientists. The multi-disciplinary environment is the growing medium for this development and has to be continuously refined.

This approach is aimed to generate scientific minds that overcome sectoral thinking, and are able to transfer inter- and transdisciplinary cooperation into research and development projects on international and transnational level. ZMT has been a driver in this field since its beginning and has set another milestone with the implementation of the Office for Knowledge Exchange. A consequent further development of this approach is targeted.

The implementation of the CD Strategy of ZMT is understood as a dynamic process continuously discussed and reflected against the needs arising from scientific, societal and political developments in Germany and tropical partner countries.

### Individual level

ZMT will continue its activities in academic training at master and doctoral studies level as the heart of its CD programme. We will take advantage of the technical developments to distribute teaching content via internet (e-learning, MOOCs) and to reorganise data acquisition, storage, and access (citizen science, Digital ZMT). The NAM S&T fellowship program, DAAD programs, and AvH and HWK fellows will be included even more effi-



ciently and strategically to bring cooperation partners to ZMT and strengthen our network in order to allow for long-term CD in joint projects. They will also be encouraged to publish their views in the working paper series of ZMT.

Technical and soft skills will receive more attention in training and education programs, as these are often the highest hitches for scientists from developing countries to work and publish with colleagues from industrialised countries on equal footing. Scientific diving, scientific writing and conference presentations are some of skills to be taught.

On the local level in Bremen, ZMT engages more and more in accepting trainees in technical and administrative fields to increase an open and intercultural mind also in young German citizens.

The envisioned recruiting of new scientific workgroup leaders positions within the next few years will provide opportunity to shape the existing activities and programs and further tune the structure and content of courses. Engagement in Fisheries Ecology in cooperation with the Biodiversity Centre in Oldenburg and the Thünen Institute for Sea Fisheries in Bremerhaven will strengthen the training and research capacities in this traditional research field at ZMT that is currently gaining strong momentum in the international context.

### **Organisational level**

ZMT will continue its active role in shaping university curricula in partner institutions and support teaching activities in this context. At the same time, we are exploring new methods for teaching that reach out in areas not easily serviced with teaching via traditional approaches. This includes the development and implementation of MOOCs (massive open online courses) and e-learning. This is part of a current proposal of ZMT to the State of Bremen and the GWK<sup>7</sup> for strengthening the digital capacities of ZMT in order to allow for open access to data, publications, learning contents, and scientific discussion and project design.

ZMT also proposes CD formats to donors. With this we try to implement unconventional tailor-shaped CD formats such as tandem supervision programs urgently needed to support academic personnel at African universities. Jointly managed field stations are also part of this strategy. With this we aim at reducing blockades in the academic systems in our partner countries.

ZMT will continue and strengthen its engagement in international CD programs such as those of IOC and IOI.

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<sup>7</sup> *Gemeinsame Wissenschaftliche Kommission = Joint Science Conference: funding body of the Leibniz Association representing the 16 States and the Federal Government of Germany*

### **Societal level**

We strongly believe in the importance of science diplomacy. Science diplomacy is necessarily based on respect and serious interest in the needs of the stakeholders in the partner countries. We are convinced that embedding our research in the societal context of the partner country from the first steps of planning is imperative for useful and sustainable science in our field. Dialogue on eye-level is the very basis of this approach, and this includes CD activities where required. On the international level, we are increasingly active in informing the non-scientific stakeholders via policy briefs and multi-stakeholder workshops.

We strategically take advantage of the rapidly evolving possibilities of digitalisation. The proposal of ZMT to the State of Bremen and the GWK envisages an extension of the institute with a new section dedicated to data science and based on the principles of open access, open data, open research design, and citizen science. This platform will allow stakeholders of all societal areas to get informed and to share thoughts regarding our research activities.

On national level, our future activities will include the continuation of public information activities as well as visits of school pupils to our premises.

### **Expected outcomes**

In the next years, we will further develop our CD activities according to our CD strategy, concentrating on our core goals. Derived from this, we expect the following outcomes:

#### **Individual level**

We expect to see the completion of 20 MSc and MA degrees per year embedded in ZMT research. Completed doctoral degrees will amount to 15 per year, these numbers include 50% of students from tropical countries.

Training on the job in field and laboratory work will involve 15 persons per year, while short courses and summer schools on special topics will see participation of 25 per year. Here again this will include 50% of the persons from tropical partner countries. We expect to host five NAM S&T fellows from tropical countries and five other fellows per year.

#### **Organisational level**

In the field of cooperation and support in the development and implementation of university curricula in marine science at partner universities, the outcome depends on the requests from the partners. We expect to have completed the development of the curriculum at the University of Manado in Indonesia, a process started in 2016.

Our activities in the implementation of scientific diving standards and training is expected to lead to certification of 20 scientific divers, 10 of which have been certified in ZMT courses in tropical countries.

Our engagement in the development of CD strategies of international organisations is expected to lead to a footprint in the following international organisations: G7, IIOE, IOC, IOI.

### **Societal level**

ZMT working groups with the support of the Office for Knowledge Exchange will undertake about six workshops for stakeholder engagement per year in the next years. It will issue about five Policy Briefs per year.

After having gained experience in advising EU bodies (EU Commission, Parliament) and engagement in activities such as the EU Ocean Conference in Malta 2017, we will continue to explore this field actively. Also we will continue to participate in agenda setting processes of the Federal Ministries in Germany where possible (e.g. Mare: N of BMBF). Our activities in informing politicians we will continue, e.g. including the politics-science forum Leibniz in der Bremischen Bürgerschaft once a year.

ZMT in the future will continue to respond to the requests of relevant panels, administrative bodies, development organisations, and fora from Germany and our partner countries and actively further the exchange with these institutions in order to strengthen the relationships, provide information, identify the needs, and explore collaboration possibilities.

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