

Advice on mobility, internships and funding for Young Water Professionals

When planning the start of your career, it can be difficult to know where to look first. **Blanca Antizar-Ladislao, Caetano Dorea and Hector Valdes** provide some helpful tips on how to build your future as a Young Water Professional.

Using the principles of biochemistry, and engineering, Young Water Professionals (YWPs) develop solutions to water and environmental problems. They are involved mainly in water pollution projects, analyse scientific data, and, control, treatment, reuse, sanitation, water supply and public health issues. They conduct research on proposed industrial wastewater treatment systems. YWP^ss design municipal water supply and perform quality control checks. YWP^ss are concerned with local and worldwide environmental and water issues. They study and attempt to minimize the effects of global warming, municipal and industrial emissions. They also are involved in the protection of wildlife. The kind of work that YWP^ss do is very diverse, for example, YWP^ss can be a researcher, designer, planner, professor, government regulatory agency official, a manager, or be involved in professional society work.

The employer of YWP^ss can be private consulting engineering companies, universities, private research companies, laboratories, government agencies, etc. The work of YWP^ss can take them around the world. Since most environmental and water problems are located where there are concentrations of people, the largest number of job opportunities coincide with where the greatest number of people live. But YWP^ss may be also required to work in remote areas.

The preparation of YWP^ss may take several stages, requiring normally a Bachelors degree in engineering, probably civil, environmental, chemical or mechanical. A Masters degree in a relevant subject may provide adequate expertise, which more and more employers are looking for. Although not necessarily required, a PhD and postdoctoral experience may provide additional advantages in the subsequent (academic) career. Since water issues are so entangled with people, it is necessary that YWP^ss understand how people and societies function.

The role that YWP^ss can play through international mobility is immense by transferring technology and knowledge while they move, understanding different social and cultural aspects, and providing solutions to specific environmental problems. Sometimes, mobility has been difficult mainly because there was scarce funding available, and occasionally difficult to obtain. Fortunately, nowadays there are many opportunities, including internships, scholarships and

fellowships, which encourage and support international mobility of YWPs at different career stages, although these may differ from country to country (Table 1). Programmes for funding in the water sector may differ from country to country, but in general there is a reasonable amount of funding bodies that YWPs may be able to apply to, either independently or with the support of a more senior colleague, individually or as part of a group (Table 2). In any case, YWPs should plan ahead, bearing in mind that any plan must be flexible. In fact, jobs change, interests change, new opportunities arise. A good approach is to ensure a good understanding of the implications of each choice made might be and to be open for potential unforeseeable changes.

Opportunities for students

At an early stage, many universities encourage undergraduate students to gain experience in industrial and academic institutions. For example, The International Association for the Exchange of Students for Technical Experience (www.iaeste.org) aims at providing students in higher education with technical experience relevant to their studies and offering employers well-qualified and motivated trainees, while facilitating a source of cultural enrichment for trainees and their host communities. There are other programmes, such as the European Union's Socrates-Erasmus (www.britishcouncil.org/erasmus-about-erasmus.htm) and the Lifelong Learning programme (http://eacea.ec.europa.eu/lfp/about_lfp/about_lfp_en.php) that facilitate mobility for students. Getting involved with a charitable organisation may also facilitate international mobility at an early stage. In the UK there are many charitable organisations (www.britishcouncil.org/eumobility-funding-charitable-organisations.htm), which provide support for research, as well as in other countries around the world (Table 3) YWPs may gain an edge over others, and thus the best chance of securing a job and gaining valuable work experience, by doing an internship.

Most of the programmes will have some requirements, such as studying in a particular country and work permits, as well as having an outstanding academic record. An internship usually takes the form of a vacation placement, which usually is between four and ten weeks over the summer. Internships allow YWPs to gain an insight into how the company works and, provided that the YWP makes a good impression, there are great chances of being offered a graduate placement, which might later on lead to a permanent position. Universities, research centres and small companies are normally very receptive to hosting undergraduates during their internships. Thus, even if this is not formally advertised, YWPs at an undergraduate level should

seek for opportunities and contact key scientist or researchers working in the water sector in order to secure internships.

Opportunities for entry level young water professionals

Entry level YWPs normally encounter a larger amount of international mobility opportunities. Within academia, YWPs are encouraged to conduct web-based searching and find out what different departments or research groups do (<http://univ.cc/world.php>). The YWP should contact those groups and find out what scholarships are available. International offices at universities are normally very helpful. There are several rankings of universities around the world, which may help to identify the most prestigious departments (www.webometrics.info; www.thegooduniversityguide.org.uk).

Another option is to apply for available scholarships, normally advertised on web pages (e.g.: www.jobs.ac.uk; www.findaphd.com). Within industry, YWPs should explore types of jobs and companies and seek for graduate programmes that many companies offer (www.prospects.ac.uk). Water companies are a main employer, but other employers include regulatory bodies (www.environment-agency.gov.uk, www.epa.gov) and environmental organisations. Networking begins to play a very important role, and thus YWPs at this level are encouraged to participate in conferences and workshops (www.iwahq.org).

Opportunities for late stage young water professionals

Late stage YWPs with an important amount of knowledge and expertise should seek for senior positions, where they can make an impact in the development of new technologies and advance of knowledge. Available postdoctoral fellowships are normally advertised on the web (e.g.: www.aeesp.org; <http://cordis.europa.eu/mc-opportunities>). Research councils also fund research through prestigious programmes which secure tenure positions (e.g.: www.rcuk.ac.uk/pages/home.aspx; www.micinn.es/portal/site/MICINN). As for the entry level, late stage YWPs should also explore types of jobs and companies and seek for vacancies that many companies offer. Looking for a job is normally a long process, which may be started by identifying job vacancies. Several companies advertise their job vacancies on their web pages, and thus one should first identify water companies specialised in a specific area. Many companies also tend to advertise job vacancies online on specific job sites, such as

IWA Publishing's My Water Career (www.my-water-career.com), Environmental Expert (<http://water.environmental-expert.com>) and New Scientist (www.newscientistjobs.com/jobs).

Helpful tips for YWP mobility, internships and funding

Various helpful for YWPs include:

- Identify in your own country weak areas which need specialised water professionals.
- Analyse your own strengths and weaknesses in the water industry.
- Pinpoint the niche in which your contribution will be useful.
- Search for internationally recognised university departments in your area of interest (fully revise university and professor academic records: How many publications do they have in the concerned area? Do they have current projects in your area of interest? Do they have fully equipped facilities?).
- Once you decide which university you are interested in, prepare and send an application letter to the selected advisor professor (together with your CV, detailing your degree and grades).
- After you get the acceptance letter you are in the condition to apply to a fellowship. There are many fellowships available every year from different countries. Normally, online information can be found in the consulate webpage of your country of interest. Be aware that the whole process takes at least one year before the studies begin. Scholarship applications require specific documentation. Nowadays, there are many scholarship applications that can be done online, but in the end you will be asked for legalised hard copies.
- Bear in mind that learning the language of the chosen country will definitely help you to integrate into the country's culture.

Tips for (post)graduate school applications:

- Apply well ahead of the intended course start date. Some funding bodies require you to do so a year in advance.
- Make sure you have all the relevant documentation.
- Follow application procedures and guidelines carefully.
- Ensure your transcripts, diplomas, certificates, etc. have been translated into the appropriate language.
- The significance of your grades / marks should also be explained.

Remember that different institutions and educational systems have different ways of ranking students.

- Be sure to emphasise on your application any degree obtained with a ‘distinction’, ‘merit’ or any other descriptor that highlights your excellence.
- Your CV should not be too long nor too short. A guidance is a maximum of two pages for applicants with an undergraduate diploma and three pages for applicants with a master’s degree or equivalent.
- Make sure you clearly state your qualifications and experience. Avoid using abbreviations and acronyms; a very prestigious institution’s abbreviated name may have no significance to someone from another country reading your CV.
- Take the time to research where you want to study. In your covering letter try to convey the message that the particular institution / research centre you are interested in fulfils your needs. Also, especially for PhD applications, be sure to show how your skills can contribute to the overall activities of the research centre. In other words, clearly state what is special about you and what is attracting you to that particular place to study.
- Avoid sending ‘blanket’ applications intended for the maximum number of institutions possible (see previous tip). This sort of practice is not very effective and can be seen as ‘junk mail’ or spam. Such applications are usually the first to be eliminated from any selection process.

Country	Funding institution	Web link
Australia	Australian Academy of Science	www.science.org.au
	Australian Research Council	www.arc.gov.au
	Australian Scholarships	http://australia.gov.au/topics/education-and-training/scholarships
	Australian Water Association	www.awa.asn.au
	Department of Education, Science and Training	www.science.gov.au
	My Future (scholarship search engine)	www.myfuture.edu.au
	National Library of Australia	www.nla.gov.au/oz/sciencew.html
	Water Quality Research Australia	www.wqra.com.au
Austria	Austrian Federal Ministry of Science and Research	http://bmwf.gv.at/startseite/forschung
	Center for Innovation and Technology (Wiennovation & the Vienna Business Agency) ZIT	www.zit.co.at
	Fonds zur Förderung der wissenschaftlichen Forschung (FWF)	www.fwf.ac.at/en
	Federal Ministry for Transport, Innovation and Technology -	www.foerderkompass.at

	Föderkompass	
	FEMtech - Women in research and technology	www.femtech.at/index.php?id=36&L=2
	Jubiläumsfond der Österreichischen Nationalbank	www.oenb.at/en/welcome_to_the_oenb.jsp
	Life Science Austria (LISA)	www.lisavr.at/siteLayout.php?language=english
	Österreichische Forschungsförderungsgesellschaft mbH (FFG)	www.ffg.at/content.php?version=2
	Researcher's mobility Portal Austria	www.researchinaustria.info
	Wiener Wissenschafts-, Forschungs- und Technologiefonds (Vienna Science and Technology Fund) WWTF	www.wwtf.at/index.php?lang=EN
Belgium	Fonds de la Recherche Scientifique (FNRS)	www1.frs-fnrs.be
Bolivia	Viceministerio de Ciencia y Tecnología. ministerio de planificación del desarrollo	www.planificacion.gob.bo
Brazil	CNPq – Conselho Nacional de Desenvolvimento Científico e Tecnológico	www.cnpq.br
	Coordenação de Aperfeiçoamento de Pessoal de Nível Superior	www.capes.gov.br
	Fundação de Amparo à Pesquisa do Estado de São Paulo	www.fapesp.br
Canada	Alberta Ingenuity Fund	www.albertatechfutures.ca
	Atlantic Innovation Fund (AIF)	www.acoa-apec.ca.gc.ca
	Canada Foundation for Innovation (CFI)	www.innovation.ca
	Canadian Institutes of Health Research (CIHR)	www.cihr.ca/e/193.html
	Canadian Water Network (CWN)	www.cwn-rce.ca
	International Scholarships	www.scholarships.gc.ca
	National Sciences and Engineering Research Council	www.nserc-crsng.gc.ca
	Networks of Centres of Excellence (NCE)	www.nce.gc.ca
	Social Sciences and Humanities Research Council (SSHRC)	www.sshrc.ca
Chile	Comisión Nacional de Ciencia y Tecnología (CONICYT)	www.conicyt.cl/573/channel.html
	Agencia de Cooperación Internacional del Gobierno de Chile (AGCI)	www.agci.cl
Europe	European Commission	http://ec.europa.eu
	European Union Research Organisations Heads of Research Councils (EUROHORCs)	www.eurohorcs.org
	European Science Foundation (ESF)	www.esf.org

	Human Frontier Science Program (HFSP)	www.hfsp.org
	The European Research Council	http://erc.europa.eu
Finland	Academy of Finland	www.aka.fi/en-gb
France	Centre National de la Recherche Scientifique (CNRS)	www.cnrs.fr
	French Ministry of Research and New Technologies	www.recherche.gouv.fr
	Institut National de la Santé et de la Recherche Médicale (INSERM)	www.inserm.fr/en/home.html
	L'Institut de recherche pour le développement (IRD)	www.ird.fr
Greece	National Hellenic Research Foundation (NHRF)	www.eie.gr/index-en.html
Germany	Alexander von Humboldt Foundation	www.humboldt-foundation.de/web/1600.html
	Bundesverband Deutscher Stiftungen	www.stiftungen.org/index.php?strg=87_124&baseID=129&
	Deutsche Forschungsgemeinschaft (DFG)	www.dfg.de
	Deutscher Akademischer Austauschdienst (DAAD)	www.daad.de
	ELFI ServiceStelle für ELektronische ForschungsförderInformationen	www.elfi.info
	Federal Ministry of Education and Research (BMBF)	www.bmbf.de
	Förderinfo der deutschen Bundesregierung	www.foerderinfo.bund.de
	Max Planck Society for the Advancement of the Sciences	www.mpg.de
	Mintek	www.mintek.co.za
	Agricultural Research Council (ARC)	www.arc.agric.za
	Water Institute of Southern Africa	www.wisa.org.za
	Water Research Commission	www.wrc.org.za
Spain	Agencia Española de Cooperación Internacional (AECI) (Becas ICI, Becas Mutis)	http://internacional.universia.net/latinoamerica/programas/
	Consejo Superior de Investigaciones Científicas (CSIC)	www.csic.es
	Fundación Carolina	www.fundacioncarolina.es
	Ministerio de Educación y Ciencia (MEC)	www.micinn.es
Switzerland	Swiss National Science Foundation (SNF)	www.snf.ch/E/Pages/default.aspx
United Kingdom	Biotechnology and Biological Sciences Research Council (BBSRC)	www.bbsrc.ac.uk
	British Chevening scholarships	www.chevening.com

	Engineering and Physical Sciences Research Council (EPSRC)	www.epsrc.ac.uk
	Natural Environment Research Council	www.nerc.ac.uk
United States of America	Fulbright fellowship	http://us.fulbrightonline.org/about.html
	American Association for the Advancement of	http://fellowships.aaas.org/index.shtml
	Science and Engineering Fellows Program	
	Department of Agriculture Cooperative State	www.csrees.usda.gov/fo/funding.cfm
	Research, Education, and Extension Service	
	Department of Energy	www.er.doe.gov/grants
	Ford Foundation	www.fordfound.org
	National Institute of Environmental Health Sciences	www.niehs.nih.gov/careers/research/trainingfrom/index.htm
	Career Development Awards	cfm
	National Institute of Health Pathways to Independence Program	http://grants.nih.gov/grants/new_investigators/index.htm
	National Science Foundation (NSF)	www.nsf.gov
	Water Reuse Foundation	www.watereuse.org/foundation
	United States Environmental Protection Agency	www.epa.gov/ncer/fellow
	Water Environment Research Foundation	www.werf.org/Content/NavigationMenu/Funding/OpenRFPs/default.htm
	Water Research Foundation	www.waterrf.org
Uruguay	Dirección de Innovación Ciencia y Tecnología para el Desarrollo (DICYT)	www.dicyt.gub.uy
Venezuela	Ministerio del Poder Popular para Ciencia y Tecnología (MppCT)	www.mct.gob.ve

Table 2. Funding bodies around the world

Country	Funding institution	Web link
Australia	Australian Research Council	www.arc.gov.au
Europe	Seventh Research Framework Programme	http://cordis.europa.eu/fp7/home_en.html
United Kingdom	Research Council	www.rcuk.ac.uk
United States	Environmental Protection Agency	www.epa.gov/ow/funding.html

Table 3. Links of charities organisations around the world		
Country	Funding institution	Web link
Australia	Australian Government	www.gov.au
Canada	Canada Revenue Agency	www.cra-arc.gc.ca/chrtsgvng/lstngs/menu-eng.html
International	United Nations	www.un.org
	United Nations Development Programme	www.undp.org
	United Nations Educational, Scientific and Cultural Organization	www.unesco.org
	United Nations Volunteer Programme	www.unv.org
	Organización de Estados Americanos (OEA)	www.educoas.org
	Programa Iberoamericano de Ciencia y Tecnología para el Desarrollo	www.cyted.org
United Kingdom	Charity Commission	www.charity-commission.gov.uk
United States	Internal Revenue Service	www.irs.gov/charities/index.html