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DisTecD, a journal for the dissemination of Design and Technology for Development

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Abstract
DisTecD is a scientific journal ealing with design and technology for human development. Its principal objective is the dissemination of topics related to design and industrial and civil engineering that contribute in any sense to human development.
Special emphasis is given to social technology. Every article published in this electronic journal is reviewed by at least two editors. The journal is freely accessible via the POLI-RED platform of the University Politechnic of Madrid.

Keywords
Human development, appropriate technology, design for development, human capacity, social innovation, disability

1. Introduction

Due to the lack of specialized journals related to human development, the general difficulty to publish such journals and being aware of the necessity to promote works related to all areas connected to human development, the digital journal DisTecD - (Diseño y Tecnología para el Desarrollo ISSN: 2386-8546) - Design and Technology for Development – was created in 2012.

The journal DisTecD was born as a result of a project on Innovation in Education from the Technical College of Higher Education in Industrial Engineering and Design (ETSIDI), part of the University Polytechnic of Madrid (UPM). The underlying objective of the journal is to publish papers and articles on human development written by teachers, researchers, professionals, students, NGOs, etc. on themes related to the objectives of the journal detailed below:

- Establish a permanent channel of communication for students/teachers/actors en the field of social development and the disabled.
- Collect and update knowledge and experience on technology related to the improvement of access to drinking water and sanitation.
- Connect social development and disability needs with investigation and provide scientific references and/or paradigms to meet them.
- Promote, spread and divulge knowledge, technology, experience and the investigation into social development and the disabled.

DisTecD is a digital or electronic journal reviewed by peers and is a free internet publication available via the POLI-RED (2015) platform that acts as data supplier and conforms with the protocol OAI-PMH (Open Archives Initiative-Protocol for Metadata Harvesting) which also offers links to portals, databases and general information services that give access to the metadata of the published documents.

2. The need for an informative journal such as DisTecD

One of the advantages of working in the University is that one can develop and apply knowledge learnt in the world of engineering. As a product of the ingenuity of both students and teachers alike, university projects are realised and on occasion give rise to further investigation work[1] which in turn could have a notable impact on development in society. The Polytechnic University of Madrid (UPM) offers the opportunity to publish papers in digital format on the Digital Archive platform UPM (2015). Access is open and free.

All these projects and papers, as well as being published should be mentioned in one or more articles, although not necessarily published, in what are known as "high impact journals", purely because many of them are overly onerous both at the consultation and at the publishing stages. It could also be said that there is a contradiction in terms between the said elitist publications and that of a paper being published dealing with cooperation in investigation and the reduction of poverty. This could make it even more difficult to be consulted about those who are most in need.

Neither must we forget that when one of these papers is presented to a high impact journal, there still exists a great difficulty in getting the paper published should it not deal with a subject that, as far as the publication's editorial is concerned, is not of great relevance. This last point relates specifically to the subject of design and technology for human development. Many of these projects and papers deal with the application of low level technology, known as social technology. This technology is considered by some authors as "bland", that is to say that it does not attain a level that entitles it to be called "technology". However, in areas of low technological development, where it is difficult to obtain materials, tools and equipment, low level technology can be utilised for a project with long term effects to contribute to an improvement in living conditions.

The appropriate technology requires fewer resources and is much easier to maintain. This means less cost and a smaller impact on the environment in respect of other comparable

[1] Thesis, Degree final projects, Degree final papers, Masters final papers.

technologies. However, we should not necessarily consider this technology as low level, as it can incorporate elements, both technological and innovative that are more advanced. Obviously, neither must we forget the changing social climate, education, advertisement and commerce, among others, of information and communication technology. Merino (2014)

At this time, according to Merino (2014), journals which are dedicated to design and technology for human development, the majority being written in English, are few and far between. Their impact is not measured by citations as used by the rest of the scientific journals, but rather by the divulgence of information and the transcendence of the topics dealt with that are fundamentally orientated to the wellbeing of those less fortunate and to the reinstatement of their dignity, giving them the capacity to achieve freely what they wish for, and what they consider necessary for their present and future, as recommended by Sen (1999) and also Nussbaum (2000) and Oosterlaken (2010).

Although some of the results of the activities reflected in the projects and papers could be published in the high impact journals, unfortunately, the majority will not be published and will be forgotten. The causes of this can be cited as for example, that the objective of the author of the thesis is the defence and completion of his or her university education. Another cause could be the lack of real time that the student or teacher has because they need to dedicate time to other activities, including the sparse access to publications for those who really need the information contained within.

Therefore, it is essential the existence of a scientific journal both serious and open that permits the divulgence of information which contributes to Human Development in any of its aspects and especially in the field of design and engineering in general. Giving special importance to technology and social innovation that promotes ways to support social outcasts. Also being able to approach complex problems and generate innovations that benefit the community, Gutierrez-Rubi y Freire (2013).

The target audience for the journal DisTecD is not only teachers, researchers, students, but also of course, those interested in this type of cooperative activity, professionals in the

field, public and private organisations, NGOs, professionals and public alike from North to South.

3. Origin and background of the journal DisTecD

Other than the activities involved with the project on Innovation in Education of the ETSIDI-UPM, was the organisation and implementation of the "First International Conference on Hand Pumps and Rams" (2013), as a forum to discuss and share experiences and opinions on technology related to water and sanitation, applied in the context of low level technology. Although it was outlined in the project on Innovation in Education, it is right to say that it could only be developed thanks to the enormous effort and tenacity of its selfless organisers.

A meeting was held between experts in the field of international cooperation, students and teachers from many universities and from many countries. Henk Holtslag, one of the prime movers of the Rope Pump in Central America, deserves a special mention for his participation in the conferences. In the general context of a lack of access to basic services, this usually means a lack of access to water and to energy. With this challenge in mind, for decades, numerous innovations have been developed in the field of sustainable power, often resolved by using hand pumps.

Between 27 and 29 November 2013, the conferences were divided into five areas of related topics. Such as, for example: Social technology, piston pumps, rope pumps, ram pumps etc., in which there were some twenty submissions for discussion. With the high level of speakers, and a very knowledgeable audience on a theme involving a great commitment on social and technological issues, it made for a very enriching forum in which numerous experiences on both technical and social innovations were shared.

As a result of these conferences, summaries of the communications were published on the internet and audiovisual recordings were posted on Canal UPM YouTube,

Answering the need to revise and publish the complete version in journal format and so allow it to be reviewed by peers.

Equally, the conferences have also served to highlight the activities that in this sector are being implemented by ETSIDI-UPM which contributes to the social and technological visibility of the college. At the same time, adding substantial value to training, critical awareness and an approach to social reality between people associated with the universities.

Despite the marked and widespread economic cuts that we have been suffering for years, we continue to work in all fields connected with human development. Much of this work is really worth publicising which would increase the added value achieved and, above all, permit the exchange of experiences and opinions. On numerous occasions, the classical broadcasting bodies, orientated to restricted and specialised fields, it could be said that they might not be the appropriate framework to divulge this work on human development in general, and in particular on the subject of applied technology.

As additional information and an adaptation in the context of poverty replete with problems, often linked to the lack of access to information about the most disadvantaged, has given rise to this digital publication. Its editorial line, therefore, is defined not only as a search for contributions to a world in need of solidarity as a base, but also rigorous forums of a practical and scientific nature where studies, design solutions, applied technology and human development can be discussed.

The publication DisTecD began its life thanks to the contribution of two initiatives related to Cooperation. Firstly, articles derived from papers from the first conferences on Hand Pumps and Rams. Also, from projects prepared by the Water Systems and Sanitation Cooperation Group-UPM, who, for several years have been focused on hand pumps and their applications, both in the development stage in the laboratory and in action, primarily in Nicaragua, Mozambique (figure 1) and Cameroon. Secondly, other communications and articles on water and sanitation: social technology, water quality, creativity and design, and lessons learned etc.

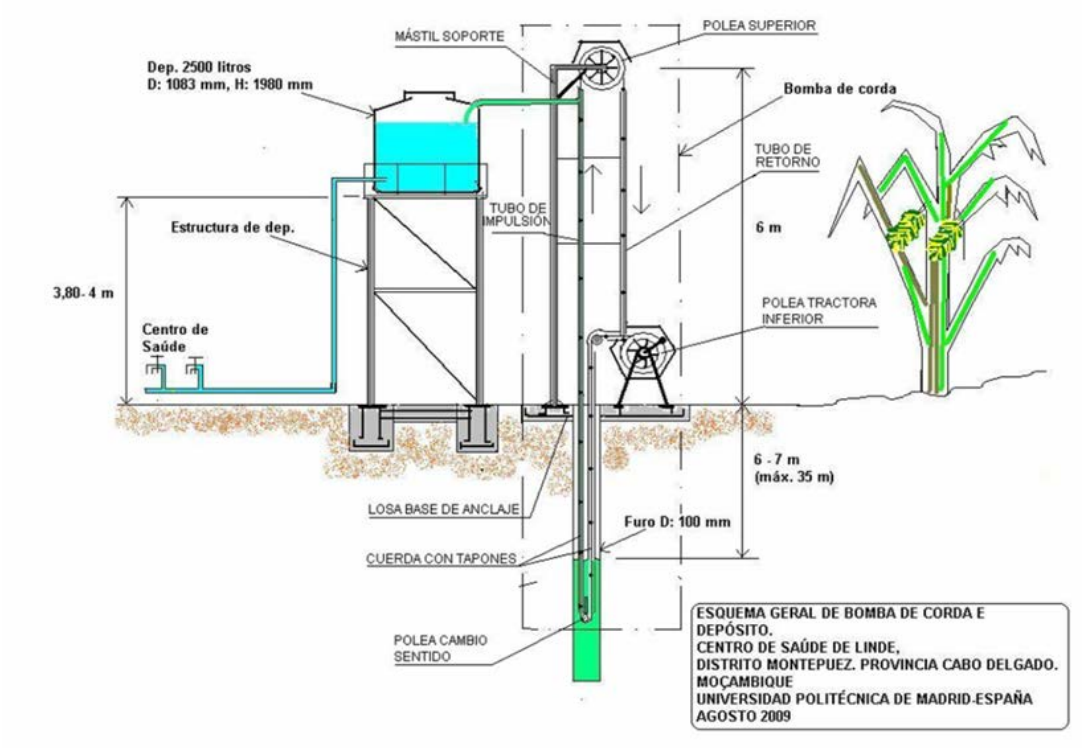

Figure 1. Rope Pump Project in Mozambique 2009.

4. Published articles and current lines. Authors

The articles published in the first issue of the journal in January 2014, whose front cover is pictured in figure 2, was structured into four blocks according to the conferences:

- The importance of social technology and the inclusion of creativity in design, commissioning and development.
- General aspects of hand pumps. Water quality.
- Rope pumps, their various design aspects and their use in the field.
- Ram pumps and others.

Figure 2. Front Cover of volume 1 (2014) of the DisTecD Journal.

The list of articles in this first issue was the following:

The importance of social technology:

- The importance of social technology to address water scarcity and its development. Andréa Cardoso Ventura, Luz Fernández García y Carla Gualdani.
- The limits of cooperation in regards to development. Lessons learned from water and sanitation projects. Josep Lobera Serrano, Alba Martínez del Campo, Tomás López de Bufalá, Andrés Narros Lluch.
- Design development. Manuel Merino Egea.
- Creativity and Development. Francisca Victoria Sánchez Martínez.

General aspects of hand pumps. Water quality:

- The structural analysis of water deposits conducted in the schools of Brazil Juan Manuel Orquín Casas y José Antonio Mancebo Piqueras.

- PVC Piston pumps, Carcara type. Their use for the extraction of rainwater in the Brazilian semiarid cisterns. Christian Daniel Polo Castaño, Edilson Ramos, Mafalda González Abelleira y José Antonio Mancebo Piqueras.
- Low cost treatment for water contaminated as a result of mining activity. María Teresa Hernández Antolín, Laura Sanz Rodríguez y José Antonio Mancebo Piqueras.
- Hydrological, hydro-geological and environmental factors which influence the choice and efficiency in the function of hand pumps. Miguel Martín-Loeches y Luis Rebollo.

Rope pumps:

- The rope pump in water supplies and food security applications. José Antonio Pérez González y José Antonio Mancebo Piqueras.
- Manual rope and piston pump – type “mecate BM-2”. Characterized by its drive power. Héctor de Caso Jaráiz y José Antonio Mancebo Piqueras.
- Experiences with rope pumps in three schools in the sub-department of Bengbis, Southern Province, Cameroon. Helena Burbano, Loreto Rebollo, José Luis Cacho, Pedro Luis Vadillo, Miguel Martínez de Guzmán, Guillermo de la Figuera y Rubén García García.
- Eight years of experience with the rope pump in Casamance, Senegal. Miguel Cerezales Rotaeche.

Ram pumps and others:

- Analysis of a ram pump in Togo. Jesús Serrano Alonso.
- The hydraulic ram. Project and installation in Ntongui (Angola) José María Romero Guerrero y Luis Lorenzo Gutiérrez.

Figure 3. Front Cover of volume 2 (2014) of the DisTecD Journal.

Continuing with the work from the first issue of the journal, a second issue was published in July 2014 with the same principles: publish projects on low level technology relating to human development and on sustainable technological applications.

Figure 3. Shows the front cover of the second issue of the journal.

Seven projects were presented in this issue on water quality, social technology, supply systems, giving answers to frequent problems in the area of sub-development. Also, an article on the contribution made by the university to the world of cooperation, from the Water and Sanitation Systems for Social Development Cooperative Group and from the Technical College of Higher Education in Industrial Engineering and Design in the Polytechnic University of Madrid.

In this issue, the articles are not structured into blocks as before, being that there were fewer and as a result, made it more difficult to classify.

- A study of water quality related to consumption is the rural communities of the sub-department of Bengbis, Southern province, Cameroon. César Hernández, Helena Burbano, Loreto Rebollo, Imma Manresa.
- Ushahidi. Manuel Merino.

- A system to access inaccessible drinking water. Jesús Serrano.
- A contribution to development cooperation from the university on water and sanitation. José Antonio Mancebo, María Teresa Hernández, Ricardo García, María del Mar Recio.
- The state of water and sanitation in the Eco-region of Lachuá, Guatemala. Esther Marqués Valdés.
- Wind pumps for extraction of subterranean water. The application of low level (low cost) social technology in Mozambique. Alicia Corcuera Martínez.
- A study of a low level (low cost) drinking water treatment system in the context of sub-development. Its application in Mtanga, Kigoma Rural, Tanzania. Jesús Sierra Joven.

5. The future of the DisTecD Journal

The following issues of the journal will continue in the same open line as the previous issues, and also in other specialized fields closely related to water and sanitation. For example, energy, food, habitat, health, etc. However, given the wide spectrum of these fields, there is a multitude of themes that can be contemplated that contribute to human development and its divulgence.

Also, the open character of the journal allows contributions on other themes related to human development and cooperation. These themes could be of interest to new authors who perhaps, would feel motivated to work and publish in future issues of the journal. We are confident that the consolidation of the journal is possible and when that happens, it will be thanks to the contributions of its authors.

6. Conclusions

The work presented in this paper briefly describes the implementation of a science and technology journal, focused on the dissemination of work and experiences in the field of human development.

The DisTecD publication began life thanks to the contribution of two initiatives related to cooperation. Firstly, the publication of the papers of the first conference on Hand Pumps and Ram Pumps, besides the work of the Water and Sanitation Systems Cooperation Group – UPM. Secondly, communications and articles related to water and sanitation: social technology, water quality, creativity and design, lessons learned, etc.

Now, and after two painstakingly edited issues, the journal can be presented to all interested parties, and an open offer can be made of the possibility of publishing in it and contributing to the improvement of access to basic services.

We would also like to take this opportunity to make a future claim, within the realm of the Congress of Educational Innovation for Technical Training, for our own space in relation to Design for Human Development.

7. Acknowledgements

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