

# **ZerOrigIndia Foundation**

## **Policy Plan 2020-2025**

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*“It is India which gave us the ingenious method of expressing all numbers by means of ten symbols, each symbol receiving a value of position as well as an absolute value, a profound and important idea which appears so simple to us now that we ignore its true merit. But its very simplicity, the great ease which it lent to all computation, puts our arithmetic in the first rank of useful inventions and we appreciate the grandeur of this achievement the more, when we remember that it escaped the genius of Archimedes and Apollonius, two of the greatest men produced by antiquity.”*

- Pierre-Simon Laplace, Renowned 18<sup>th</sup> century French astronomer and mathematician

## 1. Introduction

The ZerOrigIndia Foundation was founded in order to research the origins of the number zero in relation to India together with the philosophy behind it. There is a general acceptance that the zero digit originated in India. There are various references in the literature to support India’s claim to the innovation of the zero digit, without ever any mention made of recent, on-going or planned research to unearth fresh evidence:

- The Sanskrit language and the Vedas were predisposed towards the decimal system, containing frequent mention of multiples of ten, a hundred, a thousand et cetera up to stupendously large numbers;
- Pāṇini’s grammatical system applied the concept of ‘lopa’, or absence;
- Pingala’s metrics actually used the term śūnya for zero, but no symbol for it, in what was a form of binarism;
- Ancient Jaina works used decimal place-value notation;
- The Bakhshali manuscript used the zero digit as numeral (of uncertain date, estimates ranging from 3<sup>rd</sup> century BCE – 7<sup>th</sup> century CE and even later);
- Aryabhata I (5<sup>th</sup> century CE), famous Indian astronomer-mathematician, used positional decimals plus zero;
- Earliest inscription of zero as placeholder in India at Gwalior temple (876 CE)
- Rival claims are often mentioned such as the Khmère inscription at Sambor (683 CE) and the Malay inscription at Palembang (684 CE), it being pointed out variously that these were ‘Indianised’ at the time;

These references in the literature might very well establish the *use* of zero in India, but much research still needs to be done on ancient manuscripts to *prove* the origin of zero in India. Furthermore, research will need to be done on the manuscripts from other civilizations to exclude them as the place where zero as digit originated.

*The ZerOrigIndia Foundation’s research proposal, intended to take place in India and where necessary in other parts of the world, will focus on proving beyond reasonable doubt where and when the zero digit originated in India and if possible by whom it was innovated;*

The zero digit was subsequently transmitted to the rest of the world and was adopted by mathematicians in West Asia, Europe and later most of the world beyond. A part of the original philosophy of zero, that is, the concept of ‘emptiness’ or ‘nothingness’ and the related concept of ‘creation out of nothingness’ (*creatio ex nihilo*), was also adopted by

Western mathematicians and became part of the computational properties of mathematics and, among others, modern physics.

The ZerOrigIndia Foundation, furthermore, aims to explore this philosophy behind zero. It is the working hypothesis of the Foundation, supported by references in the literature on the subject that this philosophy may contain further knowledge of practical and theoretical significance that has as yet remained unexplored. Current mathematics and physics have reached certain limits which may be overcome by the findings of the present research proposal touching on existential issues as to the nature of our universe.

The unexplored philosophy behind the origins of zero is one aspect of the field of knowledge that the ZerOrigIndia Foundation plans to have researched as it may present fresh insights into various logico-syntactical issues that cannot be pursued further under the current state of knowledge and understanding of mathematics and physics, with its mere functional use of zero.

Furthermore, the ZerOrigIndia Foundation will highlight 'the Dutch-connection' as regards the contribution in relation to zero and the extension of the decimal system by so-called 'decimal fractions', popularized in the 17<sup>th</sup> century by Simon Stevin, advisor to the then ruling monarch of the Netherlands, Prince Maurits. As is well-known, Prince Maurits was the second son of the Father of the Fatherland, William the Silent, who had founded the University of Leiden, where Prince Maurits and Simon Stevin first met as students. It may be argued that to a large extent the basis of the present-day topology of the Netherlands characterized by its interconnected waterways, dams and dikes, locks and sluices, may be attributed to the genius of Simon Stevin, on instigation of Prince Maurits. It is in part due to this relationship with The Netherlands that the founders deemed it appropriate to establish the ZerOrigIndia Foundation in The Netherlands.

## **2. Strategy**

### **2.1 Core objectives and principles of the ZerOrigIndia Foundation**

#### **Objectives**

The objectives of the foundation, according to Article 2 of the Charter, are to:

- a. *perform independent scientific research as to the origin of the zero digit in relation to India;*
- b. *To disseminate free of charge all the knowledge/insight acquired by the research through all available public channels, including the educational system and media, and to perform all that is related thereto or that may promote the objectives as well as all other efforts befitting the status of an charitable Institute dedicated to the Public Good.*

The core objective of the ZerOrigIndia Foundation is to facilitate independent academic research on the origin of the zero digit and the related deeper philosophy that may have inspired its innovation in India. Based on the exploratory research conducted by the Foundation, it is considered plausible that ancient manuscripts in archives in India and elsewhere in the world may as yet bring to light important information concerning zero's otherwise inexplicable emergence in India. As the functional adoption of zero has already led to a revolution mathematics, science and technology and the way in which we understand various aspects of our existence, thus a deeper understanding of the philosophy that gave rise to the zero digit may perhaps result in a better understanding of the universe. It is here that the greater Public Good will be served by the proposed research of the ZerOrigIndia Foundation, just as over the centuries zero's functional adoption has played a pivotal role in affecting for the better the lives of people around the globe.

#### **Principles**

The foundation observes the following principles by which it will abide:

- To ensure that all research that takes place under its auspices will be conducted with the highest standards of objectivity, integrity and honesty and to resist pressure of any sort from any quarter that may taint the integrity of the research and its outcome;
- To engage in collaboration with institutions of higher learning and persons of high repute, who are willing to participate without personal gain in the research facilitated by the ZerOrigIndia Foundation;
- To cultivate an open and transparent attitude to allow all information and knowledge regarding the subject to be delivered to and shared with others, hence offering an open platform for exchange of information;

## **2.2 The first stage**

The very first stage of the research program will be to build and launch a website [www.zerorigindia.org] that can function as a knowledge-sourcing, -sharing, funding and publicity platform. The main functionalities of the website will be: 1) a petition to endorse the research project, 2) a crowdfunding and 3) a crowdsourcing component to facilitate the research project.

The website will enable people across the globe to be approached in order to sign a petition in support of the independent scientific research on the origin of the zero digit in India. If one subsequently would like to go further and donate money, this can be done through the crowdfunding functionality. A more filtered group of academicians, scientists and researchers will be invited to participate through crowdsourcing.

A successful crowdfunding campaign requires that people are given so-called 'perks' or rewards in return for a donation. These will be made available in the form of downloadable audio and video recordings of a special musical composition and visual art posters on the theme of 'zero' commissioned by the Foundation.

To bring the website to the attention of a large audience, a comprehensive network will be mobilized via the Board members of the ZerOrigIndia Foundation. In order to gain the trust of people who come to learn of the Foundation for the very first time, a Committee of Recommendation has been formed comprising persons of international fame and repute.

Directly prior to and after the launch of the website, a widespread (social) media campaign will also be launched to ensure maximum exposure to be accorded to this unique initiative.

## **2.2 The second stage**

It is important that through crowdfunding and other efforts, funds are collected to initiate a series of staggered research programs that will be kicked-off by the "Camp Zero 2016" brainstorming session in which scientists, researchers and students from different academic backgrounds will come together for a period of 4 to 6 weeks in order to draw up a 'roadmap' for various relevant specializations that will require subsequent multi-year in-depth research during the second stage of the project.

### **2.2.1 The third stage**

The *Monograph on Zero* book manuscript will be compiled, a collection of article contributions on the twin themes of the invention of zero and/or its significance in the field of expertise of the contributor concerned. The book will be published following the associated *International Conference-cum-workshop on Zero* in 2021 in order to include additional article submissions and latest insights to emerge at the conference-cum-workshop.

### ***2.3 Absence of profit-making***

The ZerOrigIndia Foundation is a non-profit organization. All the Foundation's proceeds will be solely applied for the purpose of serving the objectives of the organization.

### ***2.4 Destination of the liquidation balance***

According to the Charter of the ZerOrigIndia Foundation (Article 10, sub 2), the eventual positive balance of the Foundation upon liquidation shall solely be remitted to another organization that also has an ANBI status and thereby serve the Public Good. Furthermore, the Board will also identify an organization that has an objective similar to that of the ZerOrigIndia Foundation.

In the event that the liquidation balance is remitted to an organization outside of The Netherlands, then this organization will also have to serve the Public Good and have similar objectives as does the ZerOrigIndia Foundation

## **3. Policy**

### ***3.1 Activities of the Foundation***

The ZerOrigIndia Foundation shall engage in two main activities:

1. To raise funds through various means, including continuous crowdfunding;
2. To formulate and coordinate research programs.

Ad 1.: Crowdfunding is a modern and effective way to raise funds. Moreover, people become involved in the cause, which is supported by them while also serving as an indicator of the importance that people attach to such research. With the help of (social) media people all over the world can be reached and directed towards the website of the Foundation for donating towards the research. The Indian diaspora will also be approached through various Indian diaspora organizations. Besides crowdfunding, other ways and means will be employed to generate donations, including corporate and institutional funders.

Ad 2.: The formulation and execution of the research program will be conducted in conjunction with the Science Committee of the Foundation. The research will be conducted in those geographical places where the right experts and manuscripts may be found. It will be endeavored to implement various joint research programs that may lead to international cooperation between universities in India and elsewhere in the world. The outcome of the abovementioned Camp Zero 2016, the book project and associated conference-cum-workshop brainstorming sessions will be crucial in determining the content of the other research programs.

The Science Committee will also be responsible for oversight of the quality of research and safeguarding the integrity of research so that the results presented are able to withstand scientific scrutiny.

### **3.2 Capital of the Foundation**

The Foundation will not maintain higher capital reserves than necessary for the continuity of the planned activities towards the realization of the objectives of the organization.

On annual basis, an estimate will be made of the cost of the research for the coming year. Fundraising will be done in accordance with the financial requirements of the research costs. Any positive balance at the end of the year will be prorated to financing research in the upcoming year. Having said this, it is possible that a capital reserve is maintained during a longer period because there are research programs that will run over a period of 3 to 4 years. These capital reserves will then be earmarked for these research programs. The Foundation will never accumulate capital without having a specific research destination that serves the objective of the Foundation.

### **3.3 Spending policy**

The ZerOrigIndia Foundation shall allocate the funds collected in line with its objectives towards the following research projects:

#### In the short-term:

ZerOrigIndia Foundation proposes to organize CampZero 2016 and 2017 of approximately 3-4 weeks at a prominent university in India. The aim is as follows:

- select a team of about 20 young students/graduates/post-docs for this Camp Zero event to brainstorm about the so-called zero-project and to submit a written proposal for the overall zero project, which is to be carried out in various related fields of expertise;
- the written proposal is to be worked out with a view to publish a joint paper on the subject;
- the paper is also to be used as basis for the online crowdsourcing component of the ZerOrigIndia Foundation website, which is presently being built;
- the group of 20 students thus comprise part of the selection process for the team that will eventually conduct the research, which will take years to complete;
- 'bonding' activities will be promoted to nurture a global community in support of the zero project;

The central research question to be addressed: The project would serve the twin purpose of finding fresh evidence of zero's earliest appearance in India, and in the process refocus attention on the unprecedented significance of zero in its own right, as part of the decimal system, and its subsequent impact on scientific progress in the world. Furthermore, the proposed study aims to present evidence of the concept of emptiness/fullness [shunya/purna] to be a necessary, but not necessarily sufficient, precondition for the emergence of zero as fully-fledged numeral – an event unique in world history.

### In the medium- and long-long term:

Following the foundation laid by the two Camp Zero brainstorming sessions as well as the book project and associated conference-cum-workshop affording contributors to present and discuss their papers, augmented by additional scholars, who joined later on, an adjusted 'roadmap' for the way ahead will be drafted. The book project requires only nominal out-of-pocket expenses of maximum Eu. 3,000; while estimated expenditure for the conference-cum-workshop will total an estimated Eu.40,000. Funds permitting, qualified Ph.D. student / post-docs / young researchers will then be charged with conducting the longer-term in-depth research program, estimated at approximately Eu. 100,000 per researcher over a 3-4 year period.

#### ***3.4 Disposal to capital***

The ZerOrigIndia Foundation's Board of Trustees alone decide on the disposal of the Foundation's financial assets. No other person or organization shall, in any way, have a decisive say in the financial matters of the Foundation or will have access to the capital.

## **4. Miscellaneous**

### ***4.1 Remuneration policy***

The ZerOrigIndia Foundation, according to the Articles of Association, shall not pay any remuneration to the Board members, other than compensation for expenses incurred for performance in the line of duty and/or reasonable attendance cost.

For work performed of a non-policy but chiefly executive nature, compensation will be paid in conformity with market rates. In such cases, the Board shall conclude a contract with the person concerned in the form of a labor agreement or otherwise.

The remuneration policy shall aim to reward staff in accordance with standards that are acceptable and accountable to society, and befitting the status of the Foundation as charitable institution pursuing the Public Good.

When the funds of the foundation so allow, a project leader / program director will be appointed by the foundation. The salary of the program director shall be sober and befitting of a person working in the cultural and educational sector.

Both as pertaining to the compensation of expenses of the Trustees as well as to contracting and, as such, remunerating staff, the condition applies that this shall only take place inasmuch as the financial means of the Foundation permit. As such the level of aforementioned remuneration is maximized and shall only be disbursed in case of available funds. In the event of insufficient financial means, remuneration shall be prorated and adjusted downwards

### ***4.2 Description of the administrative organization***

The Foundation will create a yearly budget that will be approved by the entire Board of Trustees. Financial commitments shall be entertained only when there are sufficient funds in the account of the Foundation.

Financial commitments and payments up to Euro 500,- may be made by the treasurer without the consent of the other Board members, provided these fit the budget. In a later stage, when the Foundation has enough funds to support a program director/ project leader, he shall be mandated for financial commitments up to Euro 500,- without the prior consent of the entire Board, again only if these commitments are covered by the budget.

All financial commitments above Euro 500,- may be made only by the treasurer and the chairperson who will do so under the mandate of the Board which has approved the budget and a strategic plan of action. The financial payments shall be prepared by the accountant and presented monthly or bi-monthly (depending upon the frequency of bills received) and given to the Treasurer for approval. An overview of all revenues and costs shall be sent to all the Board members on a quarterly basis.

#### ***4.3 Publication obligation***

The ZerOrigIndia Foundation shall annually post a consumer-friendly version of its Policy Plan on its website [www.zerorigindia.org](http://www.zerorigindia.org).

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