



Criteria 3.1.2

**Sanction letters of award of seed money, Proposals & Utilisation Certificates to the teachers.**

# **Appendix-II**

**(2022-23)**

F.No.1/2022-2023/Seed Fund- Nov 22/10

Dated: 10-Nov-2022

To

Mr. Deepak Thakur  
Project Investigator  
Vatel Hotel and Tourism Business School  
Sushant University  
Gurgaon.

**Subject:** Seed funding for research project “ **Modular Rainwater Harvesting in University Campus**”

Sir/Madam

I am directed to inform you that your application for seeking seed funding from the university for the research project “**Modular Rainwater Harvesting in University Campus**” has been recommended for financial support. With this support, you will be able to procure the required resources. We hope that the support will empower the stakeholders with the latest technology.

Recommended Budget:

Head of Account	Sanctioned Budget	Remarks
Travel Expenses/Field Visits/Data Collection	75000/-	Submission of invoice and bills
Equipment/Software/Services/S subscriptions	200000/-	Submission of invoice and bills
Consumables	15000/-	Submission of invoice and bills
Total	2,90,000/-	

The support is subject to the following conditions:

1. The amount will be disbursed in three phases. You must submit the utilization certificate and other completion documents.
2. You should maintain the proper accounts of the expenditure, which shall be utilized, only on approved items of expenditure.
3. The PI has to submit the final technical report of the project after successful implementation and its utilization.



*Jeha*  
10/11/22  
Head

Centre for Research and Development  
Sushant University

F.No.1/2022-2023/Seed Fund- Nov 22/10

Dated: 10-Nov-2022

To

Mr. Ashutosh Raj anand  
Project Investigator  
School of Law  
Sushant University  
Gurgaon.

**Subject:** Seed funding for research project “ **Role of Arbitration in solving Disputes**”

Sir/Madam

I am directed to inform you that your application for seeking seed funding from the university for the research project “**Role of Arbitration in Solving Disputes**” has been recommended for financial support. With this support, you will be able to procure the required resources. We hope that the support will empower the stakeholders with the latest technology.

Recommended Budget:

Head of Account	Sanctioned Budget	Remarks
Travel Expenses/Field Visits/Data Collection	190000/-	Submission of invoice and bills
Equipment/Software/Services/S subscriptions	100000/-	Submission of invoice and bills
Consumables	20000/-	Submission of invoice and bills
Total	3,10,000/-	

The support is subject to the following conditions:

1. The amount will be disbursed in three phases. You must submit the utilization certificate and other completion documents.
2. You should maintain the proper accounts of the expenditure, which shall be utilized, only on approved items of expenditure.
3. The PI has to submit the final technical report of the project after successful implementation and its utilization.



*[Handwritten Signature]*  
Head

Centre for Research and Development  
Sushant University

F.No.1/2022-2023/Seed Fund- Nov 22/10

Dated: 10-Nov-2022

To

Ms. Harsha Yadav  
Project Investigator  
School of Art and Architecture  
Sushant University  
Gurgaon.

**Subject:** Seed funding for research project “**Seaweed-based building material**”

Sir/Madam

I am directed to inform you that your application for seeking seed funding from the university for the research project “**Seaweed-based building material**” has been recommended for financial support. With this support, you will be able to procure the required resources. We hope that the support will empower the stakeholders with the latest technology.

Recommended Budget:

Head of Account	Sanctioned Budget	Remarks
Travel Expenses/Field Visits/Data Collection	500000/-	Submission of invoice and bills
Equipment/Software/Services/S subscriptions	100000/-	Submission of invoice and bills
Consumables	42000/-	Submission of invoice and bills
Total	6,42,000/-	

The support is subject to the following conditions:

1. The amount will be disbursed in three phases. You must submit the utilization certificate and other completion documents.
2. You should maintain the proper accounts of the expenditure, which shall be utilized, only on approved items of expenditure.
3. The PI has to submit the final technical report of the project after successful implementation and its utilization.



*[Signature]*  
10/11/22  
Head

Centre for Research and Development  
Sushant University

F.No.1/2022-2023/Seed Fund- Nov 22/10

Dated: 10-Nov-2022

To

Ms. Tajinder Kaur Anand  
Project Investigator  
School of Design  
Sushant University  
Gurgaon.

**Subject:** Seed funding for research project “ **Teaching School Subjects Using Design, Art, and Craft in Gurugram**”

Sir/Madam

I am directed to inform you that your application for seeking seed funding from the university for the research project “**Teaching School Subjects Using Design, Art, and Craft in Gurugram**” has been recommended for financial support. With this support, you will be able to procure the required resources. We hope that the support will empower the stakeholders with the latest technology.

Recommended Budget:

Head of Account	Sanctioned Budget	Remarks
Travel Expenses/Field Visits/Data Collection	250000/-	Submission of invoice and bills
Equipment/Software/Services/Subscriptions	100000/-	Submission of invoice and bills
Consumables	50000/-	Submission of invoice and bills
Total	4,00,000/-	

The support is subject to the following conditions:

1. The amount will be disbursed in three phases. You must submit the utilization certificate and other completion documents.
2. You should maintain the proper accounts of the expenditure, which shall be utilized, only on approved items of expenditure.
3. The PI has to submit the final technical report of the project after successful implementation and its utilization.



  
Head  
Centre for Research and Development  
Sushant University



**Proposals & Utilisation  
Certificates**

**PROFORMA FOR SUBMISSION OF SEED FUND PROPOSAL**

**Part I: General Information**

Project Title (should be focused not exceeding 15 words): **Modular Rain Water Harvesting in University Campus**

1. i. Name of Principal Investigator: Deepak Thakur  
ii. Name of Co-Investigator: N.A
2. Collaboration if any, give details of institution(s): Nil
3. Any Project(s) previously sanctioned by any funding agency? If yes give the details:

SL. NO.	Title of the Project	File No.	Name of Division and funding agency (DST/DBT...)	Date of completion / status	Amount (Rs lakh)	Whether final project completion report has been submitted (if yes, mention date)
	NIL		NIL	NIL	NIL	NIL

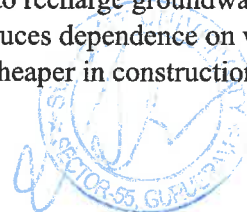
4. Whether project activities require any clearance from relevant authorities in respect of any environmental/legal/ethical issues? Municipal Corporation Gurgaon
5. Duration (months): 1month for 20 cubic meter capacity
6. Enclose the following while submitting the application form:

Duly filled application form (complete with all Annexures)- 2 hard copies	
Bio-data of the PI & Co-I -2 copies	

**Part II: Proposal Summary**

1. **Origin of the Proposal:** (Maximum 1 page)  
(Scientific/Technical rationale for doing this work should be elaborated)

Rainwater harvesting is a technology used to collect, convey and store rain water for later use From relatively clean surfaces such as a roof, land surface or rock catchment. RWH is the technique of collecting water from roof, Filtering and storing for further uses. Rainwater Harvesting is a simple technique of catching and holding rainwater where its falls. Either, we can store it in tanks for further use or we can use it to recharge groundwater depending upon the situation. RWH system provides sources of soft, high quality water reduces dependence on well and other sources and in many contexts are cost effective. RWH system is economically cheaper in construction compared to



other sources, i.e. well, canal, dam, diversion, etc .

Recently, rainwater harvesting (RWH) is gaining interest as an alternative source of safe drinking water. Getting a detailed and suitable rainfall data to have a good design of RWH system is a challenge.

In RWH system performance predictions, direct use of monthly rainfall data may lead to considerable error instead of using daily rainfall data. This paper proposes a simple and reasonable design method of rainwater harvesting system from available limited data like monthly rainfall data, conservative

Water is a vital matter to the life system and is an important component to the socio-economic development of a country ,however it is also a vulnerable gifts of the nature. The total water resources in India are estimated as 400 Mha m. In an average year, surface water of 188 M.ha.m is available in the country. In India, the ever-increasing population density, that is influencing the consumption of water has brought tremendous pressure on limited surface water resources. Underground water resources are over exploited by pumping more than the annual recharge quantity. Hence to meet the increasing demand, RWH and conservation is a must. RWH is the art of catching the rainwater drops early and where they fall before they disperse.

## 2. Objectives (Only 4-5 focused one that can be observed, measured or clearly assessable)

i.	To develop alternative water sources for the people
ii.	To develop sustainable rainwater harvesting solutions for the people of university.
iii.	By installing Modular RWH in the University, we can contribute to the well-being of Society in general & generate our own water resources.

## 3. Review of status of Research and Development in the subject

### 3.1 International Status: (Maximum 2 pages)

(Researchers working in the area worldwide and their contributions must be properly highlighted with recent references and reviews. A correct and faithful description of the international research status must be given)

Rainwater harvesting is a sustainable water management practice that has gained significant attention and adoption worldwide. Researchers from various disciplines have contributed to its development and implementation. In this concise overview, we will highlight the contributions of researchers in the field of rainwater harvesting and their impact on water conservation and sustainability.

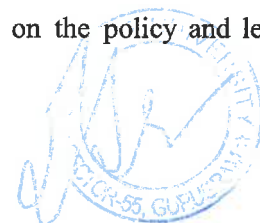
**Dr. Arturo Marquina:** Dr. Marquina, a Venezuelan researcher, made significant contributions to rainwater harvesting in arid and semi-arid regions. His work focused on designing efficient rainwater harvesting systems using low-cost materials, particularly in regions with limited access to conventional water sources. His innovations have been instrumental in providing water security to vulnerable communities in Latin America.

**Dr. David Butler:** Dr. Butler, a British civil engineer, has been a prominent figure in the development of rainwater harvesting technologies in urban areas. His research on integrating rainwater harvesting with urban water management systems has paved the way for sustainable urban planning and reduced reliance on centralized water supply systems.

**Dr. Rita Colwell:** Dr. Colwell, an American environmental microbiologist, has made significant contributions to the understanding of waterborne diseases associated with rainwater harvesting. Her research on the microbial quality of harvested rainwater and the development of innovative water treatment methods has improved the safety of rainwater for consumption.

**Dr. Ashok Gadgil:** Dr. Gadgil, an Indian-American scientist and engineer, is renowned for his research on decentralized water treatment technologies for rainwater harvesting. His inventions, such as the UV Waterworks device, have made it possible to purify harvested rainwater at the point of use, reducing the risk of waterborne diseases.

**Dr. Patricia Wouters:** Dr. Wouters, a Canadian legal scholar, has focused on the policy and legal aspects of





rainwater harvesting. Her work has influenced the development of regulations and guidelines for rainwater harvesting at national and international levels, ensuring its safe and sustainable implementation.

**Dr. Hiroshi Takakuwa:** Dr. Takakuwa, a Japanese researcher, has contributed to rainwater harvesting technology in urban areas with limited space. His work on vertical rainwater harvesting systems, where rainwater is collected from building facades, has been particularly valuable in densely populated cities.

**Dr. Margaret Owe:** Dr. Owe, a Norwegian hydrologist, has conducted extensive research on the impact of climate change on rainwater availability. Her studies have emphasized the importance of adapting rainwater harvesting techniques to changing precipitation patterns, ensuring the continued resilience of these systems in a shifting climate.

**Dr. Solomon Seyoum:** Dr. Seyoum, an Ethiopian researcher, has made significant contributions to rainwater harvesting in rural Africa. His work on community-based rainwater harvesting projects has provided sustainable water sources to remote villages, reducing water-related diseases and improving livelihoods.

**Dr. Ana Deletic:** Dr. Deletic, an Australian environmental engineer, has focused on the integration of rainwater harvesting with stormwater management in urban areas. Her research has led to the development of innovative systems that capture and store rainwater for various purposes while reducing urban flooding and pollution.

These researchers, among many others, have played pivotal roles in advancing rainwater harvesting as a sustainable water management practice worldwide. Their contributions range from technical innovations to policy advocacy, with a common goal of addressing water scarcity, improving water quality, and promoting environmental sustainability. The global impact of their work has led to the widespread adoption of rainwater harvesting as a vital component of water resource management strategies, benefiting communities, ecosystems, and future generations.

### **3.2 National Status: (Maximum 1 page)**

(Same as above to cover the contribution of Indian Scientists in the project area)

**Dr. A.C. Narayanan:** Dr. Narayanan, an Indian hydrologist, is often regarded as one of the pioneers of rainwater harvesting research. His work on rooftop rainwater harvesting systems in the 1980s laid the foundation for modern rainwater harvesting practices in India. His contributions led to the widespread adoption of rooftop rainwater harvesting as a means to recharge groundwater and provide a decentralized water supply.

**Dr. Priyankar Raha:** Dr. Raha, an Indian environmental scientist, is known for his work on rainwater harvesting in educational institutions. He has promoted rainwater harvesting as a learning tool in schools and colleges, fostering a culture of water conservation among students. His efforts have contributed to raising awareness about rainwater harvesting among the younger generation.

**Dr. Aditi Mukherji:** Dr. Mukherji, an Indian water policy expert, has conducted research on the socio-economic aspects of rainwater harvesting. Her work has highlighted the potential for rainwater harvesting to empower marginalized communities by providing access to water resources and enhancing livelihoods.

### **3.3 Importance of the proposed project in the context of current status (Maximum 1 page)**

(Highlight what is the new area or gap which will be solved in the project in relating to what is already known. This is a very important section to project the novelty content of the proposal)

Rainwater harvesting holds immense importance in the context of India's current water status. India faces several water-related challenges, including water scarcity, groundwater depletion, and water quality issues. Rainwater harvesting projects can address these challenges and offer numerous benefits:

**Water Scarcity Mitigation:** India is water-stressed, with uneven distribution of rainfall across regions. Rainwater harvesting can help capture and store rainwater during the monsoon season, providing a decentralized and reliable source of water for various uses, especially in areas with inadequate access to freshwater.

**Groundwater Recharge:** Over-extraction of groundwater for agriculture and urban consumption has led to



declining water tables in many parts of India. Rainwater harvesting can replenish aquifers by allowing rainwater to percolate into the ground, thus restoring groundwater levels and ensuring long-term water availability.

**Drought Resilience:** India frequently experiences droughts, affecting agriculture and livelihoods. Rainwater harvesting infrastructure, such as check dams and percolation tanks, can capture runoff during rainy periods and release it during dry spells, providing a buffer against drought impacts.

**Urban Water Management:** Rapid urbanization has strained municipal water supply systems in Indian cities. Rainwater harvesting in urban areas can reduce the burden on centralized water sources, promote sustainable water management, and alleviate pressure on existing infrastructure.

**Water Quality Improvement:** Many regions in India face water contamination issues, resulting in health problems. Rainwater harvesting systems can provide a source of clean water when properly designed and maintained, reducing the risk of waterborne diseases.

**Environmental Benefits:** Rainwater harvesting contributes to ecosystem health by recharging rivers and streams, maintaining base flow, and supporting aquatic habitats. It also reduces soil erosion and pollution by capturing runoff from impermeable surfaces.

**Economic Benefits:** Rainwater harvesting can lead to economic savings for individuals and communities by reducing water bills, lowering energy costs associated with groundwater pumping, and boosting agricultural productivity.

**Government Initiatives:** The Indian government has recognized the importance of rainwater harvesting and has launched various programs and policies to promote its adoption, such as the National Rural Drinking Water Program (NRDWP) and the Atal Bhujal Yojana (ABHY) for groundwater management.

**Community Development:** Rainwater harvesting projects often involve community participation and mobilization. This fosters a sense of ownership and cooperation among local residents, contributing to community development and social cohesion.

In conclusion, rainwater harvesting projects are crucial for addressing India's water challenges in an era of increasing water stress and climate uncertainty. They offer a sustainable and decentralized solution to water scarcity, groundwater depletion, and water quality issues, ultimately improving the well-being of millions of people across the country. As India continues to urbanize and grapple with changing climatic conditions, the promotion and implementation of rainwater harvesting projects should remain a top priority for policymakers, communities, and individuals alike.

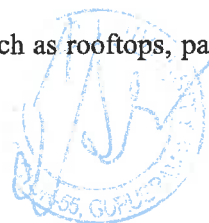
#### 4. Work Plan:

##### 4.1 Methodology: (Maximum of 5 pages)

(It should contain all the details of how each of the objectives will be addressed. This section must be detailed and have clear plans, not vague and generalized statements. It should have several schemes, tables, figures, equations etc. in addition to text, explanation and justification of why the project research plan will work)

Modular rainwater harvesting is a flexible and scalable approach to capturing and utilizing rainwater. It involves breaking down the rainwater harvesting system into modular components that can be easily installed, expanded, or customized to suit the specific needs of a site or application. Here are the steps involved in setting up a modular rainwater harvesting system:

1. **Site Assessment:** Begin by assessing the site where you plan to implement the rainwater harvesting system. Consider factors such as the size of the catchment area (rooftop, pavement, or other surfaces), local rainfall patterns, water demand, and available space for storage and treatment.
2. **Determine Water Requirements:** Calculate the water requirements for the intended purpose, whether it's for irrigation, toilet flushing, drinking, or other uses. This will help you determine the size and capacity of the rainwater harvesting system needed.
3. **Modular Component Selection:** Identify the modular components required for your rainwater harvesting system. Common components include:
  - **Catchment Surface:** This is the area where rainwater will be collected, such as rooftops, pavements, or



- other impermeable surfaces.
  - **Gutters and Downspouts:** Install gutters and downspouts to channel rainwater from the catchment surface to the storage system.
  - **Storage Tanks:** Choose the appropriate size and material for your storage tanks (plastic, concrete, or other materials). Modular tanks can be interconnected to expand storage capacity.
  - **First Flush Diverters:** These diverters prevent the initial runoff, which may contain contaminants, from entering the storage tank.
  - **Filtration and Treatment:** Depending on water quality and intended use, install filters, screens, and treatment systems to purify rainwater.
  - **Distribution System:** Design a distribution network to deliver harvested rainwater to its intended use, such as a pump, pipes, and outlets.
4. **Design the System Layout:** Plan the layout of the rainwater harvesting system. Ensure that components are correctly positioned and connected. Consider the slope and alignment of gutters, downspouts, and pipes for efficient rainwater collection and distribution.
  5. **Calculate Storage Capacity:** Determine the required storage capacity based on the site's water demand and the frequency of rainfall. Adequate storage ensures a consistent supply of rainwater during dry spells.
  6. **Install Modular Components:** Begin the installation process by setting up each modular component. This may involve:
    - Mounting gutters and downspouts on the catchment surface.
    - Positioning and securing storage tanks. Modular tanks can be interconnected for scalability.
    - Installing first flush diverters and filtration systems.
    - Setting up the distribution system to connect the storage tank to the points of use.
  7. **Maintenance:** Regular maintenance required for inspecting & cleaning filters.
  8. **Educate Users:** Ensure that users understand how to use and maintain the rainwater harvesting system. Provide information on water quality, safety, and best practices for water conservation.
  9. **Testing and Commissioning:** Before relying on the harvested rainwater for drinking or other critical uses, conduct water quality testing to ensure it meets the required standards. Commission the system and monitor its performance over time.
  10. **Expansion and Upgrades:** One of the advantages of modular rainwater harvesting systems is their scalability. You can expand the system by adding more catchment areas or storage tanks as needed to meet growing water demands.

By following these steps, one can establish a modular rainwater harvesting system that is tailored to our specific requirements, adaptable to changing needs, and contributes to water conservation and sustainability.

**4.2 Time Schedule of activities giving milestones through Gantt Chart. (Maximum 1 page)**

Step no.	Task	Start Date	End Date
1	Site Assessment	1/12/2023	3/12/2023
2	Determine Water Requirements	4/12/2023	6/12/2023
3	Modular Component Selection	7/12/2023	9/12/2023
4	Design the system layout	10/12/2023	11/12/2023
5	Calculate Storage Capacity	12/12/2023	13/12/2023
6	Install Modular Components	14/12/2023	23/12/2023
7	Maintenance	24/12/2023	25/12/2023
8	Educate Users	26/12/2023	27/12/2023
9	Testing and Commissioning	28/12/2023	30/12/2023
10	Project Completion	31/12/2023	31/12/2023



**5. Expertise:**

**5.1 Expertise available with the investigators in executing the project:** (Maximum 1 page)  
(Professional expertise existing with each of the investigators in terms of publications, Patents and preliminary results, to execute every component of the proposal should be highlighted)

None

**5.2 Bibliography**

**6. List of facilities required from Sushant University for the project implementation.**

**6.1 Infrastructural Facilities**

Sl. No.	Infrastructural Facility	Yes/No/ Not required Full or sharing basis
1.	Workshop Facility	No
2.	Water & Electricity	Yes
3.	Laboratory Space/ Furniture	No
4.	Power Generator	No
5.	AC Room or AC	No
6.	Telecommunication including e-mail & fax	No
7.	Transportation	No
8.	Administrative/ Secretarial support	No
9.	Information facilities like Internet/Library	No
10.	Computational facilities	No
12.	Any other special facility being provided	No

**6.2 Equipment available with the Sushant University for the project:**

Equipment available with	Generic Name of Equipment	Model, Make & year of purchase	Remarks including accessories available and current usage of equipment
PI & his group		NIL – To be purchased	
PI's Department		NIL – To be purchased	
Other Institute(s) in the region			



**6.3 Total Budget (Rs. in Lakhs): Rs 326450.97 for 20 cubic metre**

**BOQ for Modular Rain Water Harvesting System**

Calculation of one Rain Water Harvesting Pit as Area Given by client  
19.2 cum and  
actual capacity is 19.1 cum Pit Size in Mtr - L-5.33, W-2.74 & D-1.31

S.N o	MATERIAL	UOM	QTY	RATE/UNIT	AMOUNT
1	Drilling of Recharge wells: The Recharge well will be 8" diameter with depth of 50 Mtr. (Total No. of Recharge well- 1 No.).	Mtr	50.00	590.00	29500.00
2	Injection well insertion pipes: 6" diameter having a load capacity of 6 kg/ sq.cm.(Make supreme / prince or equivalent)	Mtr	33.33	810.00	27000.00
3	Injection well insertion slotted pipes 6" for clog resistant of rain water and reducing 3 possibility of carrying solid.(Make Supreme/Prince or equivalent)	Mtr	16.67	850.00	14166.67
4	Solvent & Screws,Clamps, Bell Plug, End Caps 4 and Bentonite for development of recharge well.	Lot	1.00	2650.00	2650.00
5	Supply & Gravel filling for packing of empty 5 space in the bore for stability to the inserted pipes.	Cum	1.57	3250.00	5102.50
6	Earth work excavation with JCB/ excavators in all type of soil.	Cum	71.02	250.00	17755.00
7	Dressing of pits excavated in step for installation purpose inside and Compaction.	Cum	19.13	220.00	4208.60
8	Material for preparation of Pit base (gravel/stone chips and river sand)	Cum	4.73	2450.00	11588.50
9	Backfilling of Excavated soil with levelling.	Cum	51.89	250.00	12972.50
10	Disposal of Soil up to 0.5 KM from the site.	Cum	19.13	230.00	4399.90
11	Supply of long fiber Geotextile of weight 400gsm/sqm, type tested as per relevant international standards for tear, tensile strength, elongation %, puncture and percolation parameters, to act as a filter medium, including overlapping at joints and welding with extrusion welder etc. complete as per approved design.	Sqm	73.73	110.00	8110.30



12	Providing in position "RAIN-SAVER Tank" recycled co-polymer modular Rain water harvesting structure with required number of large plate (685*410 mm, weight not less than 1300 Gram ) and small plate (430*410 mm, weight not less than 750 Gram) with +-1% so as to ensure 96 % void volume ratio fixed in arrangements as per specified pattern/design. Four Plate (Small) configuration. Load bearing capacity 30-35 ton/sqm Material used is 100% recycled co- polymer. Design of the modules (Large and small plates) is based on water molecule Structure.	Cum	19.13	5850.00	111910.50
13	Supply of FRP filters de-silting suspended solid catcher and strainers including bucket of SS 304 grade with long fiber foam,filtration capacity 80 kiloliters per hour.(750 MM Dia, 150mm dia inlet & outlet 1 mtr hight)	Nos	1.00	28500.00	28500.00
14	Supply of FRP Riser for Extension. This is optional depend on invert level.	Nos	1.00	10500.00	0.00
15	Assembling & Installation of Modular Rain Water Harvesting Structure with wrapping of Geotextile outside the Modular Tank and Connections of Filter.	Cum	19.13	1050.00	20086.50
16	Disilting Chamber With Main Hole Cover (1m*1m*1m*)	Nos	1.00	28500.00	28500.00
<b>Total of RWH System</b>			<b>326450.97</b>		
<b>GST 18% , Freight actual as extra</b>					
<b>Grand Total</b>					

- Recurring Cost (Rs): Nil
- Non-Recurring Cost (Rs): Nil

Sl. No.	Item	Budget			
		1 <sup>st</sup> Yr	2 <sup>nd</sup> Yr	3 <sup>rd</sup> Yr	Total



<b>A</b>	<b>Recurring</b> 1. Manpower 2. Consumables 3. Travel 4. Field testing, Demo/ Training expenses (if applicable) 5. Contingencies/Other costs 6. Institutional Overheads* 7. Any other item	Nil			
<b>B</b>	<b>Non-Recurring</b> Permanent equipment Construction of work shed/structures Fabrication of prototype equipment	Nil			
	<b>Grand Total (A+B)</b>	Nil			

**A. Recurring:**

1. Budget for Manpower

Sl. No.	Designation	No.	Qualification & experience	Monthly emolument (Rs)	Budget (Rs. in lakhs)			
					1 <sup>st</sup> Yr	2 <sup>nd</sup> Yr	3 <sup>rd</sup> Yr	Total
				Nil				

2. Budget for Consumables\*

Sl. No.	Description of consumable	Qty./Yr	Budget (Rs. in lakhs)			
			1 <sup>st</sup> Yr	2 <sup>nd</sup> Yr	3 <sup>rd</sup> Yr	Total
			Nil	Nil	Nil	Nil

\*Includes items like chemicals, raw materials for fabrication, stationery, etc.

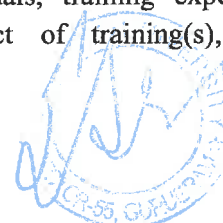
3. Budget for Travel

Sl. No.	Purpose	Budget (Rs. in lakhs)			
		1 <sup>st</sup> Yr	2 <sup>nd</sup> Yr	3 <sup>rd</sup> Yr	Total
1.	Project logistics				Nil
2.	Field activities				Nil
3.	Review meetings (if elsewhere)				Nil

4. Field Testing/ Demo/ Trainings\*

Sl. No	Description of field testing/demos /trainings	No/Yr	Budget (Rs. in lakhs)			
			1 <sup>st</sup> Yr	2 <sup>nd</sup> Yr	3 <sup>rd</sup> Yr	Total
						Nil

\*Include material for technology field testing/demo, training manuals, training expenses for beneficiaries. Note: For training give details about the subject of training(s), no. of beneficiaries/training, duration of training days, cost /training).



5. Budget for Contingencies\*

Sl. No.	Item	Qty./Yr	Budget (Rs. in lakhs)			
			1 <sup>st</sup> Yr	2 <sup>nd</sup> Yr	3 <sup>rd</sup> Yr	Total
						Nil

\*Includes items like computer time, secretarial assistance, documentation, cost of technology transfers/acquisitions (intellectual fees), lab/field trials, maintenance/servicing of equipment, incidental expenses, etc.

**B. Non-Recurring:**

Budget for Permanent Equipment/ Workshed/ Structures

Sl. No.	Equipment/Item details	Qty	Budget (Rs. in lakhs)
1.			Nil
2.			Nil
3.			Nil
4.			Nil

7. Deliverables

Deliverable	Mark <input type="checkbox"/>	Brief description
Product development/adaptation		
Process development/adaptation		
Technology package for development of the project area and local community		
Technology capability development, training & documentation (e.g. reports, papers, articles, technology manuals, patents)		
Scientific knowledge and/or data generation leading to technology development in future		
Other (Please specify)		

8. Name and address of experts/ institution interested in the subject / outcome of the project.

**SUDHIT ENVIRO  
SOLUTION PVT.LTD**  
 sudhitenviro@gmail.com, Info@sudhitenviro.com, www.sudhitenvirosolution.com  
 CIN:U74999UP2019PTC1141105  
 Contact : 0120-2985582,  
 7210128699, 9354962497  
 Branch Add:-Khasra no. 738,Duhai Industrial Area ,Ghaziabad, U.P 201206





**Utilization Certificate**

Certified that grant of ₹ 2,90,000/- (Rupees Two Lakh ninety thousand Only) sanctioned by the Center of Research and Development, Sushant University, vide letter no. F.No.1/2022-2023/Seed Fund- Nov 22/10 Dated 10<sup>th</sup> November 2022 towards financial assistance for the project titled “Modular Rainwater Harvesting in University Campus” was utilized for the purpose for which it was sanctioned.

**Financial expenditure incurred**

Sl.no	Nature of expense	Proposed Expenditure (in Rs)	Expenditure incurred (in Rs)
1	Equipment	200000	180000
2	Consumables	15000	20000
3	Travel	75,000	90,000
	<b>Total</b>	<b>₹ 2,90,000</b>	<b>₹ 2,90,000</b>

*Deepak Sharma*  
**Principle Investigator**



*[Signature]*  
**Accounts Officer**

**Account & Finance Officer**  
**Sushant University**  
**Gurugram**



**PROFORMA FOR SUBMISSION OF SEED FUND PROPOSAL**

**Part I: General Information**

1. Project Title(should be focused not exceeding 15 words): Role of Arbitration in solving Disputes
2. i. Name of Principal Investigator: Mr. Ashutosh Raj Anand  
ii. Name of Co-Investigator: Dr. Deepak Miglani
3. Collaboration if any, give details of institution(s) NA
4. Any Project(s) previously sanctioned by any funding agency? If yes give the details:

SL. NO.	Title of the Project	File No.	Name of Division and funding agency (DST/DBT...)	Date of completion /status	Amount (Rs lakh)	Whether final project completion report has been submitted (if yes, mention date)
	N.A.					

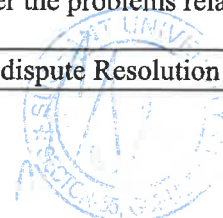
5. Whether project activities require any clearance from relevant authorities in respect of any environmental/legal/ethical issues? No
6. Duration(months): 12 Months
7. Enclose the following while submitting the application form:

Duly filled application form (complete with all Annexures)-2 hard copies	
Bio-data of the PI & Co-I-2 copies	

**Part II: Proposal Summary**

1. **Origin of the Proposal:**(Maximum 1 page)  
(Scientific/Technical rationale for doing this work should be elaborated)
2. **Objectives**(Only 4-5 focused one that can be observed, measured or clearly assessable)

i. Analyse whether Arbitration Rules are sufficient to Encounter the problems relating to Arbitration cases in Gurugram.
ii. Analyse the Advantages and Disadvantages of Arbitration as a dispute Resolution



Mechanism in cases in Gurugram.
iii. Analyse the Advantages and Disadvantages of Arbitration as a dispute Resolution Mechanism in cases in Gurugram.
iv. Analyse the Judicial Approach with respect to Arbitration in Gurugram.
v. Analyse the procedure of referral of cases under Section 89 of The Code of Civil Procedure, 1908.

**3. Review of status of Research and Development in the subject**

**3.1 International Status:(Maximum 2pages)**

(Researchers working in the area worldwide and their contributions must be properly highlighted with recent references and reviews. A correct and faithful description of the international research status must be given)

**3.2 National Status: (Maximum 1 page)**

(Same as above to cover the contribution of Indian Scientists in the project area)

**3.3 Importance of the proposed project in the context of current status (Maximum 1 page)(Highlight what is the new area or gap which will be solved in the project in relating to what is already known. This is a very important section to project the novelty content of the proposal)**

While Arbitration can be an effective method for resolving disputes, there can be various challenges and problems associated with its role in Gurugram or any other location. It's important to note that the effectiveness of Arbitration can be influenced by cultural, legal, and systemic factors. Here are some potential problems in the role of Arbitration in solving disputes in Gurugram:

**1. Cultural Factors:**

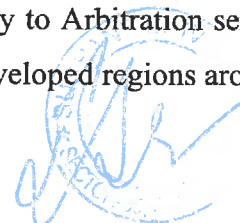
- **Hierarchy and Power Dynamics:** Gurugram, like many places, may have strong hierarchical structures in society and organizations. This can affect the dynamics of Arbitration, making it challenging for parties to express themselves freely or negotiate on equal footing.
- **Communication Styles:** Differences in communication styles, especially between urban and rural populations or diverse ethnic groups, can pose challenges in effective communication during Arbitration.

**2. Legal Framework:**

- **Enforceability of Agreements:** If the Arbitration process doesn't lead to a legally binding agreement, parties might face difficulties in enforcing the outcomes. This can be a concern, especially if one party fails to comply with the mediated agreement.

**3. Infrastructure and Accessibility:**

- **Limited Access to Arbitration Services:** Accessibility to Arbitration services might be limited in certain areas, particularly in rural or underdeveloped regions around Gurugram.



This can hinder the widespread adoption of Arbitration as a dispute resolution mechanism.

**4. Lack of Awareness:**

- **Public Awareness:** Many people may not be aware of the benefits of Arbitration or may not fully understand how the process works. This lack of awareness can lead individuals to opt for more traditional legal avenues, bypassing the potential benefits of Arbitration.

**5. Mediator Quality and Training:**

- **Quality of Mediators:** The effectiveness of Arbitration heavily depends on the skills and training of the mediators. If there is a shortage of qualified and experienced mediators in Gurugram, it can impact the quality and success of the Arbitration process.

**6. Corporate and Commercial Disputes:**

- **Complexity of Disputes:** Gurugram, being a significant corporate and commercial hub, may witness complex business disputes. Arbitration might face challenges in dealing with highly technical or intricate matters that require specialized knowledge.

**7. Government Support and Integration:**

- **Government Endorsement:** The level of support and endorsement from the local government can influence the success of Arbitration programs. Lack of government support or integration of Arbitration into the legal system might limit its effectiveness.

**8. Cultural Resistance to Alternative Dispute Resolution (ADR):**

- **Preference for Litigation:** In some cases, there might be a cultural preference for traditional litigation over alternative dispute resolution methods like Arbitration. This preference can slow down the adoption of Arbitration in Gurugram.

Addressing these challenges requires a comprehensive approach that involves training skilled mediators, raising public awareness, integrating Arbitration into the legal framework, and adapting Arbitration processes to the cultural context of Gurugram. Additionally, ongoing efforts are needed to promote the benefits of Arbitration and build trust in the effectiveness of this method for resolving disputes. Significant research has not been conducted on the issues related to Arbitration in solving disputes with special reference to Arbitration centres in Gurugram. The Indian Society is developing and the citizens are concerned about the justice delivery system. Dispensation of Justice is a Fundamental Right and the justice should not be delayed. Disputes in Court should be handled appropriately and timely. Courts are also sending parties for Arbitration. There have not been any changes in the legislation for mandatory Arbitration till date. The legislation still states that when the

court feels or when the circumstances or nature of the case so require, then the Court may send the parties for Arbitration. There is no codified statute for Arbitration where it states the process to be adopted or till what extent the Court should go for reconciliation between the parties Arbitration in dispute has not been explored much. The study will attempt to find, suggest and recommend that will aid the law makers, executive and judiciary to regularise and create a formal framework for Arbitration in solving dispute.

#### **4. Work Plan:**

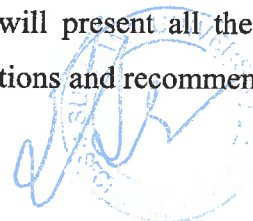
##### **4.1 Methodology:(Maximumof5pages)**

The Research will be conducted to examine, firstly, the present status of Arbitration in solving disputes and what are the provisions of the Indian law which supports Arbitration. Secondly, the issues and challenges faced while directing Arbitration in solving disputes have to be identified and explored.

The present study deals in finding how efficient is Arbitration in solving disputes and about the necessity of codification of the process of Arbitration;therefore, it would be necessary to understand the framework of the Arbitration as an alternative dispute resolution in India and the rule governing the process of Arbitration. For this purpose, the researcher will conduct a literature review of the available legislation and rules governing Arbitration. The researcher will collect primary data regarding the problems for which parties resort to Arbitration. Visit to Arbitration centre and Courts will be undertaken by the researcher to get a better insight about the process of Arbitration.

The researcher will conduct the literature review of the literature relating to the need for incorporating and/or amending the provisions with regard to mandatory Arbitration in solving disputes in the respective legislation and the need of uniform law for Arbitration. The researcher will prepare questionnaires, conduct interviews of mediators, parties in dispute and lawyers. The researcher will conduct practical visit to Arbitration centre to interact with mediators, parties in dispute, families of parties in dispute. The questionnaires and interview will be conducted to find about the need, awareness and opinion of parties in dispute, mediators and lawyers.

The researcher will compile all the data and would arrive at conclusions utilising various research tools, techniques. At the end the researcher will present all the literature and outcome of the study in form of thesis along with suggestions and recommendations.



The present study is planned to be done through Doctrinal and Empirical Research. The concentration will be towards the disputes in Arbitration centres established across the District Gurugram. The data is planned to be collected through different sources like Primary i.e. Data collected from the mediators, parties in dispute, lawyers and Arbitration centres and Secondary sources like Books, Articles and Journals.

For handling this present proposed research work in an appropriate manner and for getting desired outcomes from the work, both the Doctrinal and Empirical method would be preferred. Hence, the researcher will adopt both the Doctrinal and Empirical method to carry out the research.

- i. Doctrinal method includes arranging, ordering and systematizing legal propositions, analysis of case laws and study of legal institutions through legal reasoning. The data or information will be collected from legislative texts, foreign laws and judicial decisions.
- ii. The researcher will utilise source of information like current legislation, case laws with regard to the concepts of Arbitration in solving dispute.
- iii. Secondly, the researcher will gather and analyse Secondary sources such as reports of the Law Commission of India, Articles and Papers prepared by eminent authorities to track the evolution and current status of Arbitration in solving dispute.
- iv. Secondary sources like commentaries by legal luminaries, Articles from Journals, articles from internet, books will be referred by the researcher.
- v. The Empirical research will be carried on by collecting data or information from primary sources. The proposed study will include, preparation of questionnaires, interview, practical visit to Arbitration centre of Gurugram, visit to courts in Gurugram.
- vi. Primary data will be collected from stakeholders through a survey method with the help of the questionnaires as well as interview will be conducted to find out the need, awareness, success and issues pertaining to Arbitration in matters pending in courts.
- vii. The Primary Data will be collected from Arbitration Centre and Courts located in Gurugram.

#### 4.2 Time Schedule of activities giving milestones through Gantt Chart. *(Maximum 1 page)*



**5. Expertise:**

**5.1 Expertise available with the investigators in executing the project:** (Maximum 1 page)(Professional expertise existing with each of the investigators in terms of publications, Patents and preliminary results, to execute every component of the proposal should be highlighted)

**5.2 Bibliography**

**LIST OF REFERENCES**

**I. Statues and Rules**

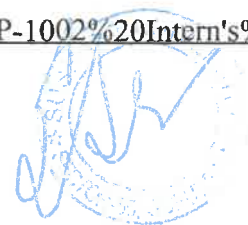
1. The Civil Procedure Arbitration Rules, 2003
2. The Arbitration and Conciliation Rules, 2004 (Delhi High Court)
3. Arbitration Training Manual of India (Arbitration and Conciliation Project Committee Supreme Court of India, Delhi)
4. The Code of Civil Procedure, 1908
5. The Commercial Courts, Commercial Division and Commercial Appellate Division of High Courts (Amendment) Act, 2018

**II. Books**

1. Lutha K., *Arbitration-An Art and Science of Conflict Resolution-Law and Practice* 46 (Legist Law Publication, Pune, 2009)
2. V.A Mohta and Anoop V. Nigam, *Arbitration, Conciliation and Arbitration* (Manupatra, New Delhi, 2008)

**III. Articles/Research Paper**

1. Dr. Justice Dhananjya Y. Chandrachud, Arbitration- realizing the potential and designing implementation strategies, Available at [http://lawcommissionofindia.nic.in/adr\\_conf/chandrachud3.pdf](http://lawcommissionofindia.nic.in/adr_conf/chandrachud3.pdf),
2. Justice Jitendra N. Bhatt, A Round Table Justice through Lok- Adalat (Peoples' Court)- A Vibrant-ADR-In India, Available at <http://www.ebc-india.com/lawyer/articles/2002v1a3.htm>
3. Justice Manju Goel, Successful Arbitration in Matrimonial Disputes, Approaches, Resources, Strategies and Management, Available at [http://www.nja.nic.in/Concluded\\_Programmes/2016-17/P-1002%20Intern's%20Report.pdf](http://www.nja.nic.in/Concluded_Programmes/2016-17/P-1002%20Intern's%20Report.pdf)



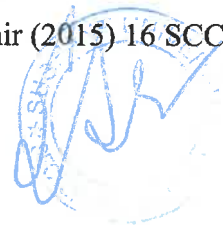
4. Justice M.M Kumar, Relevance of Arbitration to Justice Delivery System in India,  
Available at  
[https://highcourtchd.gov.in/sub\\_pages/top\\_menu/about/events\\_files/NCArbitrationNewDelhi.pdf](https://highcourtchd.gov.in/sub_pages/top_menu/about/events_files/NCArbitrationNewDelhi.pdf)
5. Niranjana J. Bhatt, Legislative Initiative for Court- Annexed Arbitration in India,  
Available at <https://www.mediate.com/articles/bhattN.cfm?nl=28>

#### **IV. Journal Paper**

1. Anil Xavier, "Arbitration: Its Origin and Growth in India" 27 Hamline Journal of Public Law & Policy (2005-2006).
2. Barbara Ashley Philips and Anthony Piazza, "How to use Arbitration 10 Litigation, 31-33(1983).
3. Jeffery G. Kichawen and Vicki Stone, "Preparing for Arbitration" 18 Litigation, 40-42 (1991).
4. Larisa Zatseva and Svetlana Racheva, "Arbitration and Legal Assistance" 2 Russian Law Journal (2014).
5. RahikaNarain and Abhinav Sankaranarayanan, "Formulating a Model Legislative Framework for Arbitration in India"11 NUJS L. Rev. 1 (2018)
6. SteventKnapnel, "Promise and Problems in Divorce Arbitration" 1 Journal of Dispute Resolution, 127-135 (1991).
7. K.K Geetha, "Mandatory Arbitration",1 Galgotias Journal of Legal Studies, (2014).

#### **V. Cases**

1. Afcons Infrastructure Ltd. v Cherian Varkey Construction Co. (P) LTD [2010] 8 SCC 24.
2. Amardeep Singh v. Harveen Kaur (2017) 8 SCC 746.
3. Dayawati v. Yogesh Kumar Gosain 2017 SCC Del 11032.
4. Justin Abraham v. Preethy Thomas (2019) SCC 839.
5. K. Srinivas Rao v. D.A. Deepa (2013) 5 SCC 226.
6. Salem Advocate Bar Association v. Union of India (2005) 6 SCC 344.
7. S.Thankikodi v. Ramuthayee AIR, 1986 Madras 263.
8. Vennangot Anuradha Samir v. Vennangot Mohandas Samir (2015) 16 SCC 596.
9. Vishal G. Nair v. Sreedevi (2019) SCC 3691.





**6. List of facilities required from Sushant University for the project implementation.**

**6.1 Infrastructural Facilities**

Sl. No.	Infrastructural Facility	Yes/No/ Not required Full or sharing basis
1.	Workshop Facility/Books/Journals/SCC online	Yes
2.	Water& Electricity	Yes
3.	Laboratory Space	Yes
4.	Furniture	Yes
5.	Power Generator	Yes
6.	AC Room or AC	Yes
7.	Telecommunication including e-mail&fax	Yes
8.	Transportation	Yes
9.	Administrative/Secretarial support	Yes
10.	Information facilities like Internet/Library	Yes
11.	Computational facilities	Yes
12.	Any other special facility being provided	Food/Stay as per requirement

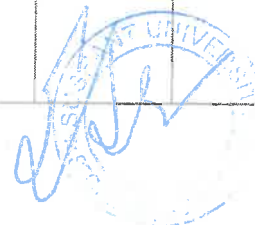
**6.2 Equipment available with the Sushant University for the project:**

Equipment available with	Generic Name of Equipment	Model, Make & year of purchase	Remarks including accessories available and current usage of equipment
PI&hisgroup			
PI'sDepartment			
OtherInstitute(s) intheregion			

**6.3 Total Budget(Rs.inLakhs):**

- RecurringCost(Rs):
- Non-RecurringCost(Rs):

Sl. No.	Item	Budget			
		1 <sup>st</sup> Yr	2 <sup>nd</sup> Yr	3 <sup>rd</sup> Yr	Total
<b>A</b>	<b>Recurring</b>				
	1. Manpower	1.20			1.20
	2. Consumables	0.20			0.20
	3. Travel	1.60			1.60
	4. Field testing, Demo/ Training expenses(ifapplicable)	0.50			0.50
	5. Contingencies/Othercosts	0.20			0.20
	6. InstitutionalOverheads*	0.20			0.20
	7. Anyotheritem	0.10			0.10



<b>B</b>	<b>Non-Recurring</b>			
	Permanentequipment	0.50		0.50
	Construction of work shed/structures	0.40		0.40
	Fabricationofprototypeequipment	0.10		0.10
	<b>GrandTotal(A+B)</b>	5.0		5.0

## A. Recurring:

### 1. BudgetforManpower

Sl. No.	Designation	No.	Qualification & experience	Monthlye molument (Rs)	Budget (Rs. inlaks)			
					1 <sup>st</sup> Yr	2 <sup>nd</sup> Yr	3 <sup>rd</sup> Yr	Total

### 2. BudgetforConsumables\*

Sl. No.	Descriptionof consumable	Qty./Yr	Budget (Rs. inlaks)			
			1 <sup>st</sup> Yr	2 <sup>nd</sup> Yr	3 <sup>rd</sup> Yr	Total
	Stationary		0.20			

\*Includesitemslikechemicals,rawmaterialsfor fabrication,stationery,etc.

### 3. Budgetfor Travel

Sl. No.	Purpose		Budget (Rs. inlaks)			
			1 <sup>st</sup> Yr	2 <sup>nd</sup> Yr	3 <sup>rd</sup> Yr	Total
1.	Projectlogistics	0.60				
2.	Fieldactivities	0.60				
3.	Reviewmeetings(ifelsewhere)	0.40				

### 4. FieldTesting/Demo/Trainings\*

Sl. No	Description of fieldtesting/demos/trainings	No/Yr	Budget (Rs. inlaks)			
			1 <sup>st</sup> Yr	2 <sup>nd</sup> Yr	3 <sup>rd</sup> Yr	Total
	Travel/20 visits/Trainings		1.60+0.50			2.10

\*Includematerialfortechnologyfieldtesting/demo,trainingmanuals,trainingexpensesforbeneficiaries.No te:Fortraininggivedetailsaboutthesubjectoftraining(s),no.ofbeneficiaries/training,duration of trainingdays, cost/training).

### 5. Budgetfor Contingencies\*

Sl. No.	Item	Qty./Yr	Budget (Rs. inlaks)			
			1 <sup>st</sup> Yr	2 <sup>nd</sup> Yr	3 <sup>rd</sup> Yr	Total
			0.20			

\*Includesitemslikecomputertime,secretarialassistance,documentation,costoftechnologytransfers/acqui sitions(intellectualfees),lab/fieldtrials,maintenance/servicingofequipment,incidentalexpenditures,etc.



**B. Non-Recurring:**

Budget for Permanent Equipment/Workshed/Structures

Sl. No.	Equipment/Item details	Qty	Budget (Rs. in lakhs)
1.	Permanent equipment shed		0.50
2.	Construction of work shed		0.40
3.	structures Fabrication of prototype equipment		0.10
4.			

7. Deliverables

Deliverable	Mark ✓	Brief description
Product development/adaptation		
Process development/adaptation		
Technology package for development of the project area and Local community		
Technology capability development, training & documentation (e.g. reports, papers, articles, technology manuals, patents)		
Scientific knowledge and/or data generation leading to Technology development in future		
Other (Please specify)		

8. Name and address of experts/institution interested in the subject /outcome of the project.

**Utilization Certificate**

Certified that grant of ₹ 3,10,000/- (Rupees Three Lakh ten thousand Only) sanctioned by the Center of Research and Development, Sushant University, vide letter no. F.No.1/2022-2023/Seed Fund- Nov 22/10 Dated 10<sup>th</sup> November 2022 towards financial assistance for the project titled "Role of Arbitration in Solving Disputes" was utilized for the purpose for which it was sanctioned.

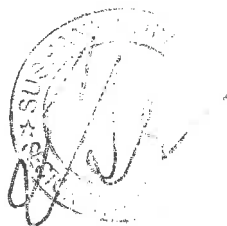
**Financial expenditure incurred**

Sl.no	Nature of expense	Proposed Expenditure (in Rs)	Expenditure incurred (in Rs)
1	Equipment	190000	200000
2	Consumables	100000	90000
3	Travel	20,000	20,000
	<b>Total</b>	<b>₹ 3,10,000</b>	<b>₹ 3,10,000</b>

  
**Principle Investigator**

  
**Accounts Officer**

**Account & Finance Officer**  
**Sushant University**  
**Gurugram**



**PROFORMA FOR SUBMISSION OF SEED FUND PROPOSAL**

**Part I: General Information**

1. Project Title (should be focused not exceeding 15 words): Seaweed based building material

2. i. Name of Principal Investigator: Ms. Harsha Yadav

ii. Name of Co-Investigator:

Collaboration if any, give details of institution(s):

Any Project(s) previously sanctioned by any funding agency? If yes give the details:

SL. NO.	Title of the Project	File No.	Name of Division and funding agency (DST/DBT...)	Date of completion / status	Amount (Rs lakh)	Whether final project completion report has been submitted (if yes, mention date)
1.	N/A	N/A	N/A	N/A	N/A	N/A

3. Whether project activities require any clearance from relevant authorities in respect of any environmental/legal/ethical issues? Yes

4. Duration (months): 3 Years

5. Enclose the following while submitting the application form:

Duly filled application form (complete with all Annexures)- 2 hard copies	No
Bio-data of the PI & Co-I -2 copies	No

**Part II: Proposal Summary**

1. **Origin of the Proposal:**

(Scientific/Technical rationale for doing this work should be elaborated)

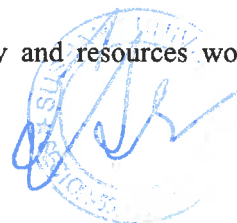
**Proposal to test the feasibility of seaweed in architecture as a building material**

**Introduction:**

Seaweed, a sustainable and renewable marine resource, holds significant potential as a building material. This proposal seeks seed funding to initiate a research project aimed at exploring the viability and applications of seaweed in the construction industry. The proposed research will investigate seaweed's structural and environmental benefits and its integration into eco-friendly construction practices.

**Scientific/Technical Rationale:**

The construction industry is one of the largest consumers of energy and resources worldwide, with a



substantial environmental impact. This research project aims to address this issue by exploring the use of seaweed, a readily available and eco-friendly material, as a building resource. Seaweed's abundance, rapid growth, and minimal environmental impact make it a promising alternative for sustainable construction.

**Proposed Solutions:**

This research is significant for several reasons:

- It promotes the use of a sustainable, renewable, and locally available building material.
- It has the potential to reduce the carbon footprint of the construction industry.
- It offers opportunities for economic development and innovation in coastal regions.
- It aligns with global sustainability goals and eco-friendly building practices.

**Conclusion:**

The potential of seaweed as a building material is a promising avenue for eco-friendly construction practices. Seed funding for this research project will be a crucial first step in exploring the viability and applications of seaweed in the construction industry, ultimately contributing to sustainable development and a reduced carbon footprint in construction.

**2. Objectives (Only 4-5 focused one that can be observed, measured or clearly assessable)**

● Investigate the mechanical properties of various seaweed species to determine their suitability for structural applications.
● Develop innovative building methods and materials utilizing seaweed, considering its natural binding properties.
● Assess the environmental impact of seaweed-based construction in comparison to traditional materials.
● Explore potential architectural designs and structures that can be created with seaweed-based materials

**3. Review of status of Research and Development in the subject**

**3.1 International Status:** (Maximum 2 pages)

(Researchers working in the area worldwide and their contributions must be properly highlighted with recent references and reviews. A correct and faithful description of the international research status must be given)

- a. **Marwa Dabaieh**, Aalborg University, The technical faculty of IT and design, Department of architecture, design and media technology

**References:** - Dare to Build: Designing with earth, reeds and straw for contemporary sustainable welfare architecture

- b. **M. Achenza · L. Fenu**

**References:** - On earth stabilization with natural polymers for earth masonry construction

- c. **Ejstrup, H.**, School of Architecture, Royal Danish Academy of Fine Arts, Copenhagen, 1435, Denmark

**References:** - TOWARDS SUSTAINABLE ENERGY INTERVENTIONS- A Study of Historic and Modern Seaweed Houses With a Focus on Tectonic Analysis and Interpretation

**3.2 National Status:** (Maximum 1 page)

(Same as above to cover the contribution of Indian Scientists in the project area)



- a) **Economically Important Seaweeds of Kerala coast, India – A Review**  
□□□□□□□□□□
- b) **Mr. Arvind Kumar**, Principal Secretary, Municipal Administration and Urban Development Department, Government of Telangana
- c) **Anindita Bhattacharjee**, Birla Institute of Technology, India
- d) **Neel Kamal**, Banasthali University, India
- e) **Akshey Bhargava**, CEPT University, India

**3.3 Importance of the proposed project in the context of current status** (Maximum 1 page)  
(Highlight what is the new area or gap which will be solved in the project in relating to what is already known. This is a very important section to project the novelty content of the proposal)

The motivation behind choosing this research topic aligns with the objectives of the Pradhan Mantri Matsya Sampada Yojana (PMMSY) in India. The PMMSY, launched by the Government of India in 2020, aims to enhance fish and marine product processing infrastructure, promote sustainable aquaculture practices, and develop coastal communities. Seaweed cultivation and utilization can be a significant component of the PMMSY's efforts to diversify marine-based industries and promote sustainable coastal livelihoods. By exploring seaweed's prospects in the architecture industry, my research not only contributes to the global need for sustainable building materials but also aligns with the PMMSY's vision of harnessing the potential of the marine sector for economic growth and environmental sustainability. Integrating seaweed-based architecture into the PMMSY's framework can open up new avenues for job creation, skill development, and income generation in coastal areas while simultaneously addressing environmental concerns. By connecting this research with the PMMSY, there can be a contribution to India's holistic approach to coastal development and empower communities through sustainable and innovative solutions.

Moreover, the motivation also stems from a pressing need for sustainable and environmentally friendly solutions in the architecture industry. As the global community grapples with the challenges of climate change and resource depletion, it has become evident that traditional building materials and construction methods are no longer viable options. The detrimental environmental impacts associated with these practices have fuelled a growing demand for alternative materials that minimize carbon emissions, reduce waste, and promote ecological balance. Seaweed, with its abundance, renewability, and remarkable properties, presents a compelling solution. By exploring seaweed's prospects in the architecture industry, it aims to contribute to a paradigm shift towards more sustainable practices and inspire a new wave of innovation that prioritizes the well-being of our planet and future generations. This research is driven by the belief that embracing seaweed as a sustainable building material holds immense potential to reshape the architectural landscape and create a more harmonious relationship between human habitation and the natural environment.

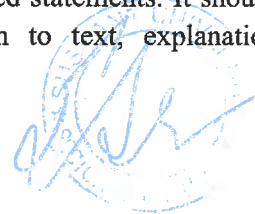
In the Indian context, there exists a significant gap in knowledge regarding the applications of seaweed in architecture. While seaweed has been extensively studied for its potential in various industries, including food, pharmaceuticals, and biofuels, its utilization in the field of architecture remains relatively unexplored. Therefore, there is a pressing need to investigate the mechanical, thermal, and aesthetic properties of seaweed and understand its potential for sustainable architectural materials.

Mechanical properties such as tensile strength, flexibility, and durability of seaweed-based materials need to be thoroughly examined to assess their structural viability in construction. In addition to mechanical and thermal properties, the aesthetic aspects of seaweed-based architecture also warrant exploration.

#### 4. Work Plan:

##### 4.1 Methodology: (Maximum of 5 pages)

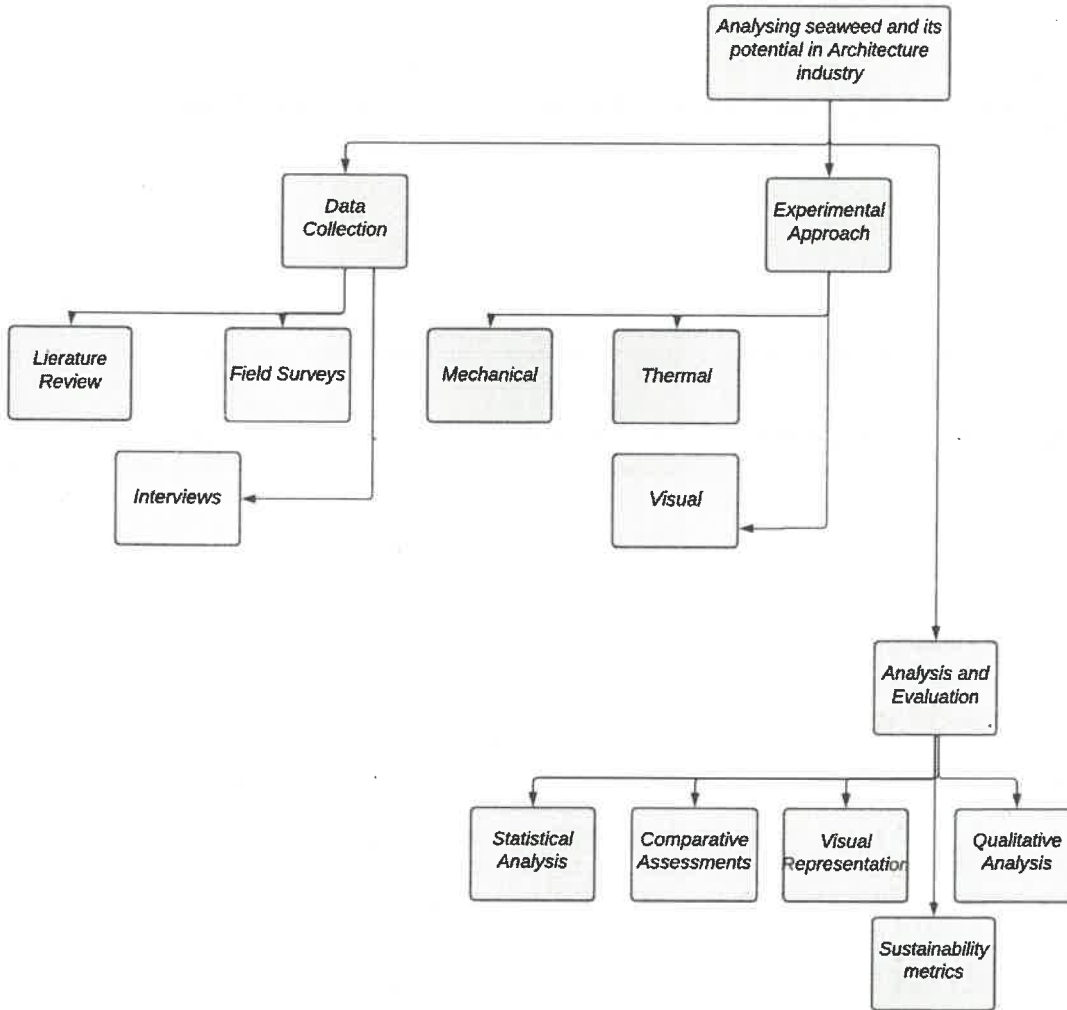
(It should contain all the details of how each of the objectives will be addressed. This section must be detailed and have clear plans, not vague and generalized statements. It should have several schemes, tables, figures, equations etc. in addition to text, explanation and



justification of why the project research plan will work)

**Justification of the Methodology:**

**RESEARCH DESIGN**



Methodology (source: Author)

The overall research approach for this study will involve a combination of literature review, experimental investigations, case studies, and comparative analysis. This multi-faceted approach will provide a comprehensive understanding of seaweed's applications in architecture within the Indian context.

To begin, a thorough literature review will be conducted to gather existing knowledge on seaweed's properties, its historical and current applications in architecture, and any relevant studies conducted in India or similar coastal regions. This literature review will serve as the foundation for the research, helping to identify the existing gap in knowledge and potential areas of exploration.

Following the literature review, experimental investigations will be conducted to assess the mechanical, thermal, and aesthetic properties of seaweed. Laboratory experiments and testing will be carried out to evaluate its strength, durability, thermal insulation capabilities, fire resistance, and other relevant characteristics. These experiments will provide empirical data and quantitative measurements to support the findings of the study.

In addition to the experimental investigations, case studies will be conducted to analyze real-world examples in India (if any) of seaweed's integration in architectural projects. These case studies will involve examining existing buildings or prototypes that have utilized seaweed in their design and construction. The purpose of these case



studies is to understand the practical challenges, benefits, and lessons learned from incorporating seaweed in architectural applications.

Furthermore, a comparative analysis will be performed to evaluate the environmental sustainability and cost-effectiveness of seaweed as compared to conventional building materials. This analysis will involve comparing the life cycle assessments, carbon footprints, energy consumption, and economic feasibility of seaweed-based architectural elements with their traditional counterparts. The aim is to provide a comprehensive evaluation of seaweed's viability as a sustainable alternative.

By combining these research approaches, the study will generate a holistic understanding of seaweed's applications in architecture. It will not only explore the properties and potential of seaweed but also assess its environmental sustainability, analyze practical case studies, and compare its performance with conventional building materials. This multi-dimensional approach will ensure a robust and comprehensive investigation of seaweed's role in promoting sustainable architectural practices within the Indian context.

## **DATA COLLECTION**

The research will employ various methods for data collection, including literature review, field surveys, laboratory testing, and interviews with experts in architecture, material science, and sustainable design. Each method will contribute to gathering valuable information and insights for the study.

**Literature Review:** A comprehensive literature review will be conducted to gather existing knowledge, research articles, books, and relevant publications related to seaweed's applications in architecture, sustainable design, and material science. This method will help establish a solid foundation of existing information, identify research gaps, and provide a theoretical framework for the study.

**Field Surveys:** Field surveys will be conducted to collect data on the availability, distribution, and abundance of seaweed along the Indian coastline. This will involve visiting coastal areas, mainly Tamilnadu and Orissa, conducting visual surveys, and collecting samples for further analysis. Field surveys will provide valuable information on the local context and availability of seaweed resources.

**Laboratory Testing:** Laboratory testing will be conducted to assess the mechanical, thermal, and aesthetic properties of seaweed. This will involve subjecting seaweed samples to various tests such as strength testing, thermal conductivity measurements, fire resistance tests, and visual inspections. These tests will provide empirical data on the performance and characteristics of seaweed as a building material.

**Interviews:** Interviews with experts in architecture, material science, and sustainable design will be conducted to gain insights and perspectives on seaweed's potential applications in architecture. Experts will be selected based on their knowledge and experience in sustainable design practices, innovative building materials, and architectural integration. These interviews will help understand the practical challenges, opportunities, and potential areas of application for seaweed in architectural design.

By utilizing a combination of these methods, the research will ensure a comprehensive and multidisciplinary approach to data collection. The literature review will provide a theoretical background, field surveys will gather contextual information, laboratory testing will generate empirical data, and interviews with experts will offer valuable insights from professionals working in the relevant fields. The integration of these methods will enhance the depth and richness of the research findings, contributing to a well-rounded understanding of seaweed's applications in architecture.

## **EXPERIMENTAL APPROACH**

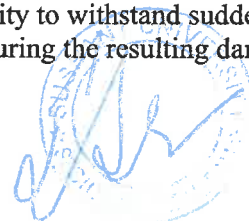
The experimental methods employed to assess the mechanical properties, thermal performance, and aesthetic characteristics of seaweed-based materials will involve several tests and measurements. The following outline provides an overview of the experimental methods for each parameter:

### **Mechanical Properties:**

**Strength Testing:** Seaweed-based material samples will be tested for compressive strength, tensile strength, and flexural strength using standard testing procedures. This will involve applying controlled loads to the samples and measuring the corresponding stress and strain values.

**Durability Testing:** The durability of seaweed-based materials will be evaluated through tests such as water absorption, moisture resistance, and resistance to degradation from environmental factors like UV exposure and temperature variations.

**Impact Resistance:** Impact tests will be conducted to assess the material's ability to withstand sudden impact or loads. This will involve subjecting the samples to controlled impacts and measuring the resulting damage or deformation.



**Thermal Performance:**

**Thermal Conductivity:** The thermal conductivity of seaweed-based materials will be determined using a heat flow meter apparatus or other suitable methods. This will involve measuring the rate of heat transfer through the material and calculating its thermal conductivity coefficient.

**Thermal Stability:** The behavior of seaweed-based materials under high temperatures will be examined using techniques such as thermogravimetric analysis (TGA) and differential scanning calorimetry (DSC). These tests will provide insights into the material's thermal stability and decomposition characteristics.

**Aesthetic Characteristics:**

**Visual Inspection:** The visual appearance of seaweed-based materials will be assessed through visual inspection, considering factors such as color, texture, surface finish, and overall aesthetic appeal.

**Surface Analysis:** Techniques like scanning electron microscopy (SEM) or atomic force microscopy (AFM) can be used to analyze the surface morphology and microstructure of the material, providing detailed information on its texture and surface features.

It is important to note that specific testing methods may vary depending on the type of seaweed-based material and its intended application. The experimental methods outlined here provide a general framework for assessing the mechanical, thermal, and aesthetic properties of such materials. Adhering to standardized testing procedures and ensuring proper sample preparation and data analysis will be crucial to obtaining accurate and reliable results. The testing methods used in the research may also vary depending on availability of funds and resources.

**ANALYSIS AND EVALUATION**

The data collected from the experimental investigations, field surveys, interviews, and literature review will be analyzed using various analytical techniques and tools. The following describes some of the methods commonly employed in the evaluation of research data:

**Statistical Analysis:** Statistical techniques will be applied to analyze and interpret the collected data. Descriptive statistics, such as mean, median, and standard deviation, can be used to summarize and describe the data set. Inferential statistics, including t-tests, or regression analysis, may be employed to determine relationships, significance, and correlations between different variables.

**Comparative Assessments:** Comparative analysis will be conducted to evaluate and compare the performance of seaweed-based materials with existing traditional building materials or alternative sustainable materials. This assessment can involve quantitative measurements, such as comparing mechanical properties, thermal conductivity, or environmental impact metrics, to identify the advantages and limitations of seaweed-based materials.

**Sustainability Metrics:** Sustainability metrics will be employed to assess the environmental, social, and economic impacts of seaweed-based materials. Life cycle assessment (LCA) can be utilized to evaluate the overall environmental footprint of the materials, considering factors such as energy consumption, greenhouse gas emissions, and resource depletion. Social and economic indicators may also be considered to assess the broader sustainability aspects of integrating seaweed-based materials into architectural practices.

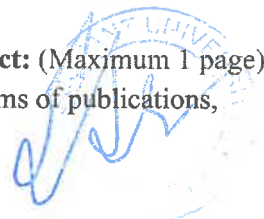
**Visual Representation:** Findings and results will be visually represented through graphs, charts, diagrams, and other visual tools. This can aid in presenting trends, patterns, and relationships within the data, making it easier for readers to comprehend and interpret the findings. Visual representations can also enhance the communication of research outcomes to a broader audience, including architects, designers, and stakeholders.

**Qualitative Analysis:** Qualitative data, such as interview transcripts or survey responses, will be analyzed using thematic analysis or content analysis techniques. This involves identifying recurring themes, patterns, or insights within the qualitative data to gain a deeper understanding of the perspectives, experiences, and opinions expressed by experts, architects, and other stakeholders.

Overall, the combination of statistical analysis, comparative assessments, sustainability metrics, and visual representation will provide a comprehensive and robust evaluation of the data collected in the research. These analytical techniques and tools will support the interpretation of findings, enable meaningful comparisons, and contribute to the overall conclusions and recommendations of the study.

**5. Expertise:**

**5.1 Expertise available with the investigators in executing the project: (Maximum 1 page)**  
(Professional expertise existing with each of the investigators in terms of publications,



Patents and preliminary results, to execute every component of the proposal should be highlighted)

N/A

## 5.2 Bibliography

N/A

## 6. List of facilities required from Sushant University for the project implementation.

### 6.1 Infrastructural Facilities

Sl. No.	Infrastructural Facility	Yes/No/ Not required Full or sharing basis
1.	Workshop Facility	Yes
2.	Water & Electricity	Yes
3.	Laboratory Space/ Furniture	Yes
4.	Power Generator	Yes
5.	AC Room or AC	Yes
6.	Telecommunication including e-mail & fax	Not required Full or sharing basis
7.	Transportation	Yes
8.	Administrative/ Secretarial support	Yes
9.	Information facilities like Internet/Library	Yes
10.	Computational facilities	Yes
12.	Any other special facility being provided	N/A

### 6.2 Equipment available with the Sushant University for the project:

Equipment available with	Generic Name of Equipment	Model, Make & year of purchase	Remarks including accessories available and current usage of equipment
PI & his group	N/A	N/A	N/A
PI's Department	N/A	N/A	N/A
Other Institute(s) in the region	N/A	N/A	N/A

### 6.3 Total Budget (Rs. in Lakhs): Five lakhs (10, 00,000/-)

- Recurring Cost (Rs): Four lakh and Fifty thousand (9,50,000/-)
- Non-Recurring Cost (Rs): Fifty thousand (50,000/-)

Sl. No.	Item	Budget			Total
		1 <sup>st</sup> Yr	2 <sup>nd</sup> Yr	3 <sup>rd</sup> Yr	



<b>A</b>	<b>Recurring</b> 1. Manpower 2. Consumables 3. Travel 4. Field testing, Demo/ Training expenses (if applicable) 5. Contingencies/Other costs 6. Institutional Overheads* 7. Any other item	3,00,000	3,50,000	3,00,000	9,50,000/-
<b>B</b>	<b>Non-Recurring</b> Permanent equipment Construction of work shed/structures Fabrication of prototype equipment	15,000	15,000	20,000	50,000/-
	<b>Grand Total (A+B)</b>				<b>10,00,000/-</b>

**A. Recurring:**

1. Budget for Manpower

Sl. No.	Designation	No.	Qualification & experience	Monthly emolument (Rs)	Budget (Rs. in lakhs)			
					1 <sup>st</sup> Yr	2 <sup>nd</sup> Yr	3 <sup>rd</sup> Yr	Total
1.	Mechanical scientist	1	M.B.A	40	30,000	30,000	--	60,000
2.	Lab testing	1	Scientist	20	40,000	40,000	40,000	1,20,000
3.	Structure Engineer	1	M.tech	15	--	--	50,000	50,000
4.	Data Analyst/Statistician	1	B.Com	10	--	--	50,000	50,000
5.	Research Assistants	1	Master in Architecture.	20	10,000	10,000	10,000	30,000

2. Budget for Consumables\*

Sl. No.	Description of consumable	Qty./Yr	Budget (Rs. in lakhs)			
			1 <sup>st</sup> Yr	2 <sup>nd</sup> Yr	3 <sup>rd</sup> Yr	Total
1.	N/A	N/A	N/A	N/A	N/A	N/A

\*Includes items like chemicals, raw materials for fabrication, stationery, etc.

3. Budget for Travel

Sl. No.	Purpose	Budget (Rs. in lakhs)			
		1 <sup>st</sup> Yr	2 <sup>nd</sup> Yr	3 <sup>rd</sup> Yr	Total
1.	Project logistics	10,000	10,000	10,000	30,000
2.	Field activities	50,000	50,000	50,000	1,50,000

3.	Review meetings (if elsewhere)	10,000	10,000	10,000	30,000
----	--------------------------------	--------	--------	--------	--------

#### 4. Field Testing/ Demo/ Trainings\*

Sl. No	Description of field testing/demos /trainings	No/Yr	Budget (Rs. in lakhs)			
			1 <sup>st</sup> Yr	2 <sup>nd</sup> Yr	3 <sup>rd</sup> Yr	Total
1.	N/A	N/A	N/A	N/A	N/A	N/A

\*Include material for technology field testing/demo, training manuals, training expenses for beneficiaries. Note: For training give details about the subject of training(s), no. of beneficiaries/training, duration of training days, cost /training).

#### 5. Budget for Contingencies\*

Sl. No.	Item	Qty./Yr	Budget (Rs. in lakhs)			
			1 <sup>st</sup> Yr	2 <sup>nd</sup> Yr	3 <sup>rd</sup> Yr	Total
1.	Computer	1	20,000	50,000	30,000	1,00,000
2.	Secretarial assistance	1	10,000	10,000	10,000	30,000
3.	Documentation	1	--	50,000	50,000	1,00,000
4.	Cost of technology transfers/acquisitions	1	20,000	50,000	30,000	1,00,000
5.	Lab/field trials	N/A	N/A	N/A	N/A	N/A
6.	Maintenance/servicing of equipment	1	10,000	20,000	20,000	50,000
7.	Incidental expenses	1	10,000	20,000	20,000	50,000

\*Includes items like computer time, secretarial assistance, documentation, cost of technology transfers/acquisitions (intellectual fees), lab/field trials, maintenance/servicing of equipment, incidental expenses, etc.

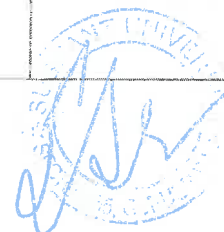
#### B. Non-Recurring:

##### Budget for Permanent Equipment/ Workshed/ Structures

Sl. No.	Equipment/Item details	Qty	Budget (Rs. in lakhs)
1.	Lab	1	15,000
2.	Workshop	1	15,000
3.	Store	1	20,000

#### 7. Deliverables

Deliverable	Mark ✓	Brief description
Product development/adaptation	X	X
Process development/adaptation	X	X
Technology package for development of the project area and local community	✓	Courier
Technology capability development, training & documentation (e.g. reports, papers, articles, technology manuals, patents)	✓	Stationary



Scientific knowledge and/or data generation leading to technology development in future	√	software
Other (Please specify)	N/A	N/A

8. *Name and address of experts/ institution interested in the subject / outcome of the project.*



**Utilization Certificate**

Certified that grant of ₹ 6,42,000/- (Rupees Six Lakh forty-two thousand Only) sanctioned by the Center of Research and Development, Sushant University, vide letter no. F.No.1/2022-2023/Seed Fund- Nov 22/10 Dated 10<sup>th</sup> November 2022 towards financial assistance for the project titled “Seaweed-based building material” was utilized for the purpose for which it was sanctioned.

**Financial expenditure incurred**

Sl.no	Nature of expense	Proposed Expenditure (in Rs)	Expenditure incurred (in Rs)
1	Equipment	100000	120000
2	Manpower	300000	280000
3	Consumables	42000	42000
4	Travel	200000	200,000
	<b>Total</b>	<b>₹ 6,42,000</b>	<b>₹ 6,42,000</b>

  
**Principle Investigator**



  
**Accounts & Finance Officer**  
**Sushant University**  
**Gurugram**



**PROFORMA FOR SUBMISSION OF SEED FUND PROPOSAL**

**Part I: General Information**

1. Project Title (should be focused not exceeding 15 words):

**Teaching School Subjects Using Design, Art, and Craft in Gurugram**

2. i. Name of Principal Investigator: Tajinder kaur Anand (School of Design, Sushant University)

ii. Name of Co-Investigator: Sombit Mukherjee

3. Collaboration if any, give details of institution(s): NA

4. Any Project(s) previously sanctioned by any funding agency? If yes give the details:

SL. NO.	Title of the Project	File No.	Name of Division and funding agency (DST/DBT...)	Date of completion / status	Amount (Rs lakh)	Whether final project completion report has been submitted (if yes, mention date)
NA	NA	NA	NA	NA	NA	NA

5. Whether project activities require any clearance from relevant authorities in respect of any environmental/legal/ethical issues? NO

6. Duration (months): 12 Months

7. Enclose the following while submitting the application form:

Duly filled application form (complete with all Annexures)- 2 hard copies	
Bio-data of the PI & Co-I -2 copies	



**Part II: Proposal Summary**

1. **Origin of the Proposal:** (Maximum 1 page)  
(Scientific/Technical rationale for doing this work should be elaborated)

Traditional methods of teaching school subjects often focus on rote learning, which can lead to disinterest and limited understanding among students. This project aims to address this issue by incorporating design, art, and craft into the curriculum to make learning more engaging, creative, and enjoyable for students.

2. **Objectives (Only 4-5 focused one that can be observed, measured or clearly assessable)**

i. Introduce design, art, and craft as innovative teaching tools to enhance students' learning experience.
ii. Foster creativity and critical thinking skills among students.
iii. Improve retention and understanding of school subjects through hands-on learning.
iv. Encourage collaboration and teamwork among students.

3. **Review of status of Research and Development in the subject**

**3.1 International Status:**

The use of design, art, and craft in teaching school subjects is a valuable approach to education that has gained recognition for its effectiveness in enhancing learning. While the integration of art, design, and craft into school subjects is gaining recognition and momentum globally, its extent and success can vary by region, educational system, and individual schools. Nonetheless, the trend is clear, and the benefits of this approach for enhancing education are widely acknowledged. It not only makes learning more engaging but also prepares students with valuable skills for the 21st century, such as creativity, critical thinking, and problem-solving.

**National Status:**

**National Curriculum Framework (NCF) and Art Education:** The National Curriculum Framework for School Education, formulated by the National Council of Educational Research and Training (NCERT), emphasizes the importance of art education as an essential component of a child's holistic development. The NCF aims to integrate art and craft within the mainstream curriculum.

**Art Integration:** Many Indian schools, both public and private, have been increasingly integrating art and craft into subjects like mathematics, science, social studies, and languages. The goal is to make learning more engaging and interactive.

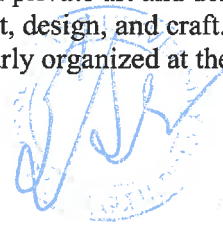
**Art and Craft Electives:** Several Indian education boards, such as the Central Board of Secondary Education (CBSE), offer elective courses in art and design for middle and high school students. These courses allow students to explore their creative abilities.

**Government Initiatives:** The government has launched initiatives such as the "Ek Bharat Shrestha Bharat" program, which promotes cultural exchange and artistic expression. Additionally, the "Beti Bachao, Beti Padhao" campaign encourages the use of art and creative activities to raise awareness about gender issues and empowerment.

**Art-Based Competitive Examinations:** Competitive examinations, such as the National Institute of Fashion Technology (NIFT) entrance exam, the National Institute of Design (NID) entrance exam, and the Fine Arts entrance exam for various universities, have fueled interest in art and design as career options.

**Private Art and Design Schools:** India has seen a growth in the number of private art and design schools and institutes. These institutions offer a wide range of courses in art, design, and craft.

**Art Festivals and Competitions:** Art festivals and competitions are regularly organized at the school,



district, and state levels to encourage students to explore their creative talents.

**Challenges:** Despite these efforts, there are challenges such as resource constraints, lack of trained art educators, and variations in implementation across different states and schools. There is also a need for standardized assessment methods for art-integrated subjects.

### **Importance of the proposed project in the context of current status**

**a) Engagement and Motivation:** Design, art, and craft activities can make learning more engaging and enjoyable. When students are motivated and excited about what they're studying, they are more likely to be actively involved in the learning process.

**b) Multisensory Learning:** These activities engage multiple senses, such as touch, sight, and fine motor skills. This multisensory approach can enhance the learning experience and make it more memorable.

**c) Creativity and Innovation:** Art and design stimulate creative thinking and problem-solving skills. They encourage students to think critically, generate new ideas, and explore different perspectives.

**d) Holistic Understanding:** Integrating design, art, and craft into various subjects allows students to see connections between seemingly disparate topics. It fosters a more holistic understanding of knowledge and promotes interdisciplinary thinking.

**e) Hands-On Experience:** Design and craft projects provide hands-on experience and allow students to apply theoretical knowledge in practical ways. This practical application often results in a deeper understanding of concepts.

**f) Cultural Appreciation:** Art and design can be used to explore and appreciate the cultural and historical aspects of different subjects. This can help students develop cultural sensitivity and a broader perspective.

**g) Communication Skills:** Through design and art, students can learn to express their thoughts, ideas, and emotions visually. Effective visual communication is a valuable skill in a world where visual information is prevalent.

**h) Fine Motor Skills Development:** Particularly for younger students, art and craft activities help develop fine motor skills, which are essential for tasks like writing, drawing, and more.

**i) Self-Expression and Emotional Well-being:** Art and craft provide a medium for self-expression and can be an outlet for emotions. It can help students process feelings and develop a sense of self-identity.

**j) Real-World Applications:** Design and craft often have practical applications in the real world. For example, engineering design principles can be taught through hands-on projects that involve building prototypes

### **3.2 Work Plan:**

### **3.3 Methodology: (Maximum of 5 pages)**

#### **1. Curriculum Integration:**

a. Identify Learning Objectives: Begin by identifying the learning objectives of the subject you're teaching. What do you want your students to know and understand? What skills should they develop?

b. Select Relevant Topics: Choose topics or units within the subject that lend themselves to creative exploration through design, art, and craft.

#### **2. Activity Planning:**



- a. Design Creative Activities: Develop hands-on, art, and craft activities that align with the chosen topics. These activities should facilitate the exploration and understanding of the subject matter. For example, if teaching geometry, you could have students create geometric art using compasses and rulers.
- b. Materials and Resources: Gather the necessary materials and resources. Ensure that you have art supplies, craft materials, and any relevant tools readily available.
- c. Safety Precautions: Prioritize safety, especially when working with tools and materials. Educate students on safety measures and provide appropriate supervision.

### **3. Five Phases of Design Activity Planning:**

- a. Design Creative Activities: Develop hands-on, art, and craft activities that align with the chosen topics. These activities should facilitate the exploration and understanding of the subject matter. For example, if teaching geometry, you could have students create geometric art using compasses and rulers.
- b. Materials and Resources: Gather the necessary materials and resources. Ensure that you have art supplies, craft materials, and any relevant tools readily available.
- c. Safety Precautions: Prioritize safety, especially when working with tools and materials. Educate students on safety measures and provide appropriate supervision.

### **4. Instructional Process:**

- a. Introduction: Begin each lesson with an introduction that provides context and outlines the learning objectives. Explain how the creative activity relates to the subject matter.
- b. Demonstration: If necessary, demonstrate the specific techniques and skills students will use in the activity. This can be especially helpful for complex or new craft techniques.
- c. Guided Exploration: Allow students to explore and experiment with the materials and concepts. Provide guidance, answer questions, and encourage creativity. Support and scaffold the learning process as needed.
- d. Peer Collaboration: Encourage students to work together, share ideas, and learn from each other. Collaborative projects can promote teamwork and problem-solving skills.

### **5. Assessment and Feedback:**

- a. Formative Assessment: Use formative assessment techniques to gauge students' understanding and progress during the creative activities. This can include observations, discussions, and mini-assignments.
- b. Feedback: Provide constructive feedback to help students improve their work. Emphasize both the creative and academic aspects of the projects.
- c. Reflection: Encourage students to reflect on their own work and learning process. Ask them to consider how the creative activities deepened their understanding of the subject.

### **6. Integration and Application:**

- a. Connecting to Curriculum: Ensure that the creative activities are integrated with the main curriculum. Help students see the connections between what they've created and the academic content they've learned.
- b. Real-World Application: Whenever possible, discuss real-world applications of the knowledge and skills acquired through art and craft activities. How can these skills be useful beyond the classroom?

### **7. Documentation and Display:**

- a. Portfolio Building: Encourage students to maintain a portfolio of their art and craft projects. This can serve as a record of their creative journey and a tool for reflection.
- b. Exhibition and Sharing: Organize exhibitions or sharing sessions where students can display their work to the school community, parents, or peers. This provides recognition and motivation for students.

**8. Reflection and Evaluation:**

- a. Self-Reflection: After completing the creative projects, have students reflect on their experiences. Ask them to consider how the design, art, and craft activities contributed to their learning and understanding.
- b. Teacher Evaluation: Reflect on the effectiveness of the methodology. Consider what worked well and where improvements can be made for future lessons.

**9. Continuous Improvement:**

- a. Use feedback from students, fellow educators, and self-reflection to continually refine and adapt the methodology. Incorporate new ideas and activities to keep the approach fresh and engaging.

**10. Professional Development:**

Stay informed about best practices in art, design, and craft education. Attend workshops, conferences, or training sessions to enhance your teaching skills.

**This methodology aims to combine creative and hands-on learning with traditional academic content, providing a well-rounded and engaging educational experience for students. It fosters creativity, critical thinking, and a deeper understanding of subjects.**

Top of Form

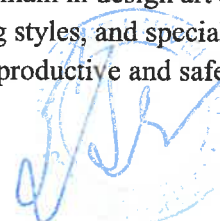
**3.4 Time Schedule of activities giving milestones through Gantt Chart.**

Stage	Activity Detail	Number of Weeks
Empathize	Research and gather study materials	4
Empathize	Introduction to design principles to end users	4
Empathize	Synthesize findings	1
Define	Analyze user needs and challenges	3
Define	Draft problem statements	2
Ideate	Brainstorming sessions	10
Ideate	Selection of best ideas	5
Prototype	Develop critical design processes	10
Prototype	Gather initial feedback	6
Test	Test with end users	3
Test	Refine and iterate	2

**4. Expertise:**

**4.1 Expertise available with the investigators in executing the project:**

The principal investigator has a strong understanding of the principles and concepts of design, art, and craft is essential. This includes knowledge of art history, various art forms and styles, design principles, and different crafting techniques. Expertise in teaching design, art, and craft involves the ability to differentiate instruction to meet the needs of a diverse group of students. Taught more than 700 students in the same domain in design art & craft . This includes adapting lessons for different skill levels, learning styles, and special needs. Effective classroom management is important to create a productive and safe learning



environment. Skilled in organizing materials, managing time, and maintaining discipline while allowing for creative expression.

#### 4.2 Bibliography

Gulliksen, M. S., & Hjordemaal, F. R. (2016). Choosing content and methods: Focus group interviews with faculty teachers in Norwegian pre-service subject teacher education in design, art, and crafts. *Scandinavian Journal of Educational Research*, 60(1), 1-19.

Houghton, N. (2013). Craft education: what it is, where it comes from, where it's going. *Making Futures*, 2, 174-182.

Daichendt, J. (2010). *Artist teacher: A philosophy for creating and teaching*. Intellect Books.

Hung, S., & Magliaro, J. (2007). *By hand: The use of craft in contemporary art*. Princeton Architectural Press.

LaPlantz, S. (2016). *The art and craft of handmade books*. Courier Dover Publications.

Buszek, M. E. (Ed.). (2011). *Extra/ordinary: Craft and contemporary art*. Duke University Press.

#### 5. List of facilities required from Sushant University for the project implementation.

##### 5.1 Infrastructural Facilities

Sl. No.	Infrastructural Facility	Yes/No/ Not required Full or sharing basis
1.	Workshop Facility	YES
2.	Water & Electricity	YES
3.	Laboratory Space/ Furniture	YES
4.	Power Generator	YES
5.	AC Room or AC	YES
6.	Telecommunication including e-mail & fax	YES
7.	Transportation	YES
8.	Administrative/ Secretarial support	YES
9.	Information facilities like Internet/Library	YES
10.	Computational facilities	YES
12.	Any other special facility being provided	

**5.2 Equipment available with the Sushant University for the project:**

Equipment available with	Generic Name of Equipment	Model, Make & year of purchase	Remarks including accessories available and current usage of equipment
PI & his group	Laptop	Lenovo, 2020	Not a high end machine, not sufficient for project
PI's Department	3D printer	Shaper jet	The equipment is old and needs to be upgraded. More number of units are required
Other Institute(s) in the region			

**5.3 Total Budget (Rs. in Lakhs):**

- Recurring Cost (Rs):
- Non-Recurring Cost (Rs):

Sl. No.	Item	Budget			
		1 <sup>st</sup> Yr	2 <sup>nd</sup> Yr	3 <sup>rd</sup> Yr	Total
<b>A</b>	<b>Recurring</b>				393000
	1. Manpower	1,20000			
	2. Consumables	50000			
	3. Travel	30000			
	4. Field testing, Demo/ Training expenses (if applicable)	20000			
	5. Contingencies/Other costs	20000			
	6. Institutional Overheads*	10000			
	7. Any other item	5000			
<b>B</b>	<b>Non-Recurring</b>				80000
	Permanent equipment (tripods, tablet etc)	50000			
	Projector	30000			
	<b>Grand Total (A+B)</b>	473000			

**A. Recurring:**

1. Budget for Manpower

Sl. No.	Designation	No.	Qualification & experience	Monthly emolument (Rs)	Budget (Rs. in lakhs)			
					1 <sup>st</sup> Yr	2 <sup>nd</sup> Yr	3 <sup>rd</sup> Yr	Total
1	PI	1	Masters In design Management	12000	144000			144000
2	CO-PI	1	Masters Textile Design	12000	144000			144000



2. Budget for Consumables\*

Sl. No.	Description of consumable	Qty./Yr	Budget (Rs. in lakhs)			
			1 <sup>st</sup> Yr	2 <sup>nd</sup> Yr	3 <sup>rd</sup> Yr	Total
1	Cardboard, metal sheets, pipes		10000			
3	Adhesives/glue guns/3Dpen		5000			
4	Fitting tools		1500			
5	Stationery		1000			
6	Measuring instrument		3000			
7	Basic tools		4500			
8	Travel		5000			

\*Includes items like chemicals, raw materials for fabrication, stationery, etc.

3. Budget for Travel

Sl. No.	Purpose	Budget (Rs. in lakhs)			
		1 <sup>st</sup> Yr	2 <sup>nd</sup> Yr	3 <sup>rd</sup> Yr	Total
1.	Travel	10000			10000
2	Project logistics	5000			5000
3.	Field activities	5000			5000

4. Field Testing/ Demo/ Trainings\*

Sl. No	Description of field testing/demos /trainings	No/Yr	Budget (Rs. in lakhs)			
			1 <sup>st</sup> Yr	2 <sup>nd</sup> Yr	3 <sup>rd</sup> Yr	Total
	Testing/demo	10	20000			20000

\*Include material for technology field testing/demo, training manuals, training expenses for beneficiaries. Note: For training give details about the subject of training(s), no. of beneficiaries/training, duration of training days, cost /training).

5. Budget for Contingencies\*

Sl. No.	Item	Qty./Yr	Budget (Rs. in lakhs)			
			1 <sup>st</sup> Yr	2 <sup>nd</sup> Yr	3 <sup>rd</sup> Yr	Total
	Intellectual fees, equipment servicing	5	20000			20000

\*Includes items like computer time, secretarial assistance, documentation, cost of technology transfers/acquisitions (intellectual fees), lab/field trials, maintenance/servicing of equipment, incidental expenses, etc.

**B. Non-Recurring:**

Budget for Permanent Equipment/ Workshed/ Structures

Sl. No.	Equipment/Item details	Qty	Budget (Rs. in lakhs)
1.	Tablets, tripods		50000
2.	Projector		30000

6. Deliverables

Deliverable	Mark √	Brief description
Product development/adaptation		
Process development/adaptation	*	For planning regular workshops
Technology package for development of the project area and local community		
Technology capability development, training & documentation (e.g. reports, papers, articles, technology manuals, patents)		
Scientific knowledge and/or data generation leading to technology development in future	*	Development of Workshop conducting methods
Other (Please specify)		

7. Name and address of experts/ institution interested in the subject / outcome of the project.

Tajinder kaur Anand (School of Design, Sushant University)

Sombit Mukherjee (School of Design, Sushant University)





**Utilization Certificate**


Certified that grant of ₹ 6,42,000/- (**Rupees Six Lakh forty-two thousand Only**) sanctioned by the Center of Research and Development, Sushant University, vide letter no. F.No.1/2022-2023/Seed Fund- Nov 22/10 Dated **10<sup>th</sup> November 2022** towards financial assistance for the project titled “**Teaching School Subjects Using Design, Art, and Craft in Gurugram**” was utilized for the purpose for which it was sanctioned.

**Financial expenditure incurred**

Sl.no	Nature of expense	Proposed Expenditure (in Rs)	Expenditure incurred (in Rs)
1	Equipment	100000	120000
2	Manpower	300000	280000
3	Consumables	42000	42000
4	Travel	200000	200,000
	<b>Total</b>	<b>₹ 6,42,000</b>	<b>₹ 6,42,000</b>

  
**Principle Investigator**



  
**Accounts Officer**  
**Account & Finance Officer**  
**Sushant University**  
**Gurugram**

