



## ABSTRACT

Disaster Management- ANNUAL PLAN 2017-2018 - New Scheme - Rs.246.60 Lakhs sanctioned for Unmanned Aerial Vehicle Photogrammetric Mapping for Flood Preparedness in the State of Tamil Nadu under Tamil Nadu Innovation Initiatives (TANII) (Round- I) Schemes for the year 2017-2018 - Orders issued.

**Revenue Department, Disaster Management Wing, D.M.II section**

**G.O(Ms) No.247**

**Dated: 03.08.2017**

ஹேவிளம்பி, ஆடி 18,  
திருவள்ளூர் ஆண்டு 2048

**Read:**

1. Announcement made by the Hon'ble Minister for Revenue, on the Floor of the Legislative Assembly on 10.07.2017.
2. From the Member Secretary, State Planning Commission, Ezhilagam, Chennai-5, Letter No.5475/ SPC(PC)/2016, Dated 27.02.2017.
3. From the Principal Secretary/Commissioner of Revenue Administration, D.O.Letter No.RA.4(1)/ 39031/2016, Dated 19.10.2016

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### **ORDER:**

The Hon'ble Minister for Revenue made the following announcement on the Floor of the Legislative Assembly on 10.07.2017 as follows:-

10. வெள்ளத்தடுப்பு பணிகளுக்காக ஆளில்லா வானூர்தி மூலம் வான்வழி புகைப்படவியல் ஆய்வு.

மாண்புமிகு இதயதெய்வம் புரட்சித் தலைவி அம்மா அவர்களின் நல்லாசியுடன், மாண்புமிகு முதலமைச்சர் அவர்கள் ஆணையின்படி, வெள்ளத்தினால் ஏற்படும் சேதங்களை குறைப்பதற்கு ஆற்றுப்படுகைகள் மற்றும் நீர்நிலப்பகுதிகளை சரியாக பராமரிப்பதற்கும், நீர்வழி பாதைகளை துல்லியமாக கண்டறிவதற்கும், அணைகள் கட்டுவதற்கான இடங்களை தேர்வு செய்வதற்கும், கால்வாய்களின் தொடர்ச்சியினை கண்டறிவதற்கும், பிற நீர்வழி பாதைகளை ஒன்றுடன் ஒன்று இணைப்பதற்கும் மற்றும் பேரிடர்கால தணிப்பு நடவடிக்கைகளை மேற்கொள்வதற்கும் வசதியாக ரூ.7.01 கோடி செலவில் வானூர்தி மூலம் வான்வழி புகைப்படவியல் ஆய்வு மேற்கொள்ளப்படும்.

2. In the reference second read above, the Member Secretary, State Planning Commission has stated that the "Tamil Nadu Innovation Initiatives

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(TANII)" in the State Planning Commission is to promote innovation in Government and Government Agencies. The "State Innovation Fund" in the State Planning Commission would finance new schemes if they are truly innovative in nature. Accordingly, every year there will be two or more rounds of sanction of financing from the "State Innovation Fund". The State Planning Commission has appraised the proposals received from Revenue Department and after detailed appraisal, the schemes are recommended as detailed below for the year 2017-18 (First Round).

### **Unmanned Aerial Vehicle Photogrammetric Mapping**

The watercourse data is currently dependent on field sketches which are prepared several decades ago. An accurate picture of the water courses can be obtained through aerial imageries which will provide valuable inputs for identifying locations for dams, missing links of canals and possible opportunities for interlinking of water courses. Unmanned Aerial Vehicle imagery, maps from Photogrammetric software and flood simulation models present themselves as very valuable tools to survey and identify disaster-prone areas for a better understanding of flood risk. Therefore the Revenue Administration Department proposed the project "Unmanned Aerial Vehicle Photogrammetric Mapping" at a total outlay of Rs.701.60 lakhs for a period of three years under funding from Tamil Nadu Innovation Initiatives (TANII).

3. The State Planning Commission appraised the proposal in detail. The images captured using Unmanned Aerial Vehicle will be pre-processed stitched and converted into useful maps for further understanding of the situations of river basins and water courses to initiate flood mitigation measures. The project will capture images of water courses covering 10,000 sq.km in the State and will be implemented over a period of 3 years. The project is to be implemented by Revenue Department's State Disaster and Response Force in collaboration with Anna University's Centre for Aerospace Research, Madras Institute of Technology (MIT) Campus. The use of Unmanned Aircraft Systems and its imagery in disaster response has become increasingly popular in recent years. However, very few organizations are currently using them to understand and reduce disaster risk in their community. Unmanned Aerial Vehicle imagery, maps from photogrammetric software and flood simulation models present themselves as very valuable tools to survey and identify disaster-prone areas for a better understanding of flood risk. The State Planning Commission taking into account the benefits viz. less cost compared to satellite or other aerial survey methods and more accurate images with less than 6 cm spatial resolution as well as on demand Aerial data collection has decided to recommend the proposal.

4. However, in as much as Government have already sanctioned Rs.20.00 crores to Anna University under Tamil Nadu Innovation Initiatives (TANII) for the year 2015-16 for a similar project's initial takeoff under which Anna University can commercially develop Unmanned Aerial Survey (UAS) related products and Services and market to suitable agencies including Government of India. As this project is a collaborative project with Anna University it has been decided that the

equipments that are already sanctioned to Anna University need not be sanctioned to this project. This issue has been further consulted with Anna University's Aerospace Centre. It is ascertained that the existing Tamil Nadu Innovation Initiatives (TANII) project sanctioned to Anna University titled "Design and development of Unmanned Aerial Vehicles" has been sanctioned for the purpose of development and designing the various types of Unmanned Aerial Vehicles. Under this project funding, equipment/components have been purchased for the fabrication of Unmanned Aerial Vehicles. This project is only meant for manufacturing Unmanned Aerial Vehicles. The cost of the proposed project includes the expenditures towards the operational cost, outsources services, accessories for aerial mapping, consumables and maintenance of Unmanned Aerial Vehicles. This project is only meant for using Unmanned Aerial Vehicles for Aerial mapping related to disaster management applications. There is no overlap of funding between both of these projects. However, it is agreed that the equipment, components and instruments, fabrication cost for Unmanned Aircraft System including mission payloads required for the present projects shall be utilised with the Anna University's earlier project under Tamil Nadu Innovation Initiatives (TANII). The funds available with Anna University for the year 2015-16 proportionately. The State Planning Commission recommended the project with an outlay of Rs.701.60 lakhs for a period of three years subject to the condition that the staff cost of Rs.222.84 lakhs shall only be allowed as operational expenses on outsourcing basis. The recommended outlay for the schemes for implementations are as follows:-

Sl.No.	Name of the Scheme	Recommended Outlay			
		1st Year	2nd Year	3rd Year	Total
(Rs. in Lakhs)					
1	Unmanned Aerial Vehicle Photogrammetric Mapping for Flood Preparedness in the State of Tamil Nadu	246.60	199.28	255.72	701.60
<b>Total</b>		<b>246.60</b>	<b>199.28</b>	<b>255.72</b>	<b>701.60</b>

5. In the reference third read above, The Principal Secretary/ Commissioner of Revenue Administration has recommended the proposal for Unmanned Aerial Vehicle Photogrammetric Mapping for Flood Preparedness in the State of Tamil Nadu for funding as detailed below:-

**Brief Description of the Project:**

- Tamil Nadu is a multi-hazard prone State with major hazards being Floods, Drought and Land Slides in specified districts. Of these 3 disasters flood is the major disaster causing severe damages to life and property. Similarly Drought and Land Slide can cause crippling effects even if they are localized.

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- Most of the damages caused by floods are due to failure of proper upkeep of water courses in river basins and water sheds. Currently the water course data is dependent on field sketches which are prepared several decades ago. An accurate picture of the water courses can be obtained through aerial imageries which will provide valuable inputs for identifying locations for dams, missing links of canals and possible opportunities for interlinking of water courses.

The use of Unmanned Aircraft Systems and its imagery in disaster response has become increasingly popular in recent years. However, very few organizations are currently using them to understand and reduce disaster risk in their community. Unmanned Aerial Vehicle imagery, maps from photogrammetric software and flood simulation models present themselves as very valuable tools to survey and identify disaster-prone areas for a better understanding of flood risk.

Using Unmanned Aerial Vehicle, the images captured will be preprocessed, stitched and converted in to useful maps for further understanding of the situations of river basins and water courses to initiate flood mitigation measures. The project will capture images of water courses covering 10,000 sq.km in the State will be implemented over a period of 3 years.

#### **The benefits of this proposal**

- More accurate images with less than 6 cm spatial resolution.
- Less cost compared to satellite or other aerial survey methods.
- On demand Aerial data collection.

#### **APPLICATIONS**

- Identification of flood prone areas and inputs for preparedness of flood management.
- Identification of Locations to construct dam/regulators etc.,
- Identification of disconnected routes in the rivers and water courses for quick recovery to link the disconnected routes and prevent flooding.
- Identification of the possible shortest routes for laying roads to reduce the distance.
- Identification of encroachments and blockages in the water courses.

#### **ECONOMIC BENEFITS OF THE PROJECT**

Unmanned Aerial Vehicles (UAVs) can be used for mapping large areas in close range combining aerial and terrestrial photogrammetry as an alternative for existing aerial mapping technologies in small scale areas. Usage of Unmanned Aerial Vehicles reached a level of practical reliability and professionalism which allow the use of these systems as mapping platforms. Unmanned Aerial Vehicle based mapping provides not only the required accuracy with respect to cadastral laws and policies as well as requirements for the generation of elevation models in small-scale areas such as gravel pits. Unmanned Aerial Vehicles are also competitive to other measurement technologies in terms of economic aspects.

**ESTIMATE COST OF THE PROJECT:**

The total cost estimated for the project Unmanned Aerial Vehicle Photogrammetric Mapping of water courses for Flood Mitigation in The State of Tamil Nadu is as follows:-

Item	Budgetary support From TANII (Rs.in Lakhs)		
	Ist Year	2nd Year	3rd Year
<b>A. Recurring</b>			
Staff cost	66.6	74.28	81.96
<b>Total-A</b>	66.6	74.28	81.96
<b>B. Non-Recurring</b>			
(i) Remote Sensing equipments and computers	100	25	40
(ii) Others (UAV Maintenance, Consumables Contingency)	80	100	120
<b>Total-B</b>	180	125	160
<b>Grand Total (A+B)</b>	246.6	199.28	241.96
Grand Total project cost for 3 years	687.84		
Over Head (2%)	13.75		
<b>Total Project Cost</b>	701.59		

6. The Project will be implemented by availing the technical support of Centre for Aerospace Research, Madras Institute of Technology (MIT) Campus of Anna University, who have already developed photogrammetric maps for Tenpennai River in Dharmapuri District.

7. Based on the announcement made by the Hon'ble Minister for Revenue on the Floor of the Legislative Assembly on 10.07.2017 and based on the proposal of the Principal Secretary/Commissioner of Revenue Administration and based on the approval of the State Planning Commission, the Government accord sanction for a sum of Rs.246.60 lakhs (Rupees Two hundred forty six lakh and sixty thousand only) for implementing the project of Unmanned Aerial Vehicle Photogrammetric Mapping for Flood Preparedness in the State of Tamil Nadu under Tamil Nadu Innovation Initiatives (TANII) (Round-I) Schemes for the year 2017-2018.

8. The amount sanctioned in paragraph 7 above shall be debited to the following head of account :-

Sl.No.	Head of Account	Amount (in lakhs)
1.	"2029 - 00 Land Revenue - 001 Direction and Administration - State's Expenditure - JB Unmanned Aerial Vehicle Photogrammetric Mapping for Flood Preparedness in the State of Tamil Nadu - Scheme under State Innovative Fund - 19 Machinery and Equipments - 01 Purchase. (D.P.No.2029 00 001 JB 1910)".	74.00

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2.	"2029 - 00 Land Revenue - 001 Direction and Administration - State's Expenditure - JB Unmanned Aerial Vehicle Photogrammetric Mapping for Flood Preparedness in the State of Tamil Nadu - Scheme under State Innovative Fund - 33 Payments for professional and Special Services - 04 Contract Payment. (D.P.No.2029 00 001 JB 3347)".	66.60
3.	"2029 - 00 Land Revenue - 001 Direction and Administration - State's Expenditure - JB Unmanned Aerial Vehicle Photogrammetric Mapping for Flood Preparedness in the State of Tamil Nadu - Scheme under State Innovative Fund - 76 Computer and Accessories - 01 Purchase. (D.P.No.2029 00 001 JB 7610)".	26.00
4.	"2029 - 00 Land Revenue - 001 Direction and Administration - State's Expenditure - JB Unmanned Aerial Vehicle Photogrammetric Mapping for Flood Preparedness in the State of Tamil Nadu - Scheme under State Innovative Fund - 76 Computer and Accessories - 02 Maintenance. (D.P.No.2029 00 001 JB 7629)".	80.00
	<b>Total</b>	<b>246.60</b>

9. The above expenditure shall be met from the State Innovation Fund by deducting under the following head of account:-

**"2029 - 00 Land Revenue - 902 Deduct - Amount met from State Innovation Fund - State's Expenditure - JB Deduct - Amount met from State Innovation Fund - 30 Inter - Account Transfers."  
(DPC : 2029 00 902 JB 3007)**

**And contra debiting**

**J. Reserve Fund (b) Reserve Funds not bearing interest - 8229 - 00. Development and Welfare Funds - 200. Other Development and Welfare Funds - BE. State Innovation Fund.  
(DPC: 8229 00 200 BE 0006) (Outgo)**

10. The Principal Secretary/ Commissioner of Revenue Administration is authorized to draw and disburse the amount sanctioned in paragraph 7 above. He

is also directed to send a utilization certificate to Government at appropriate time without fail.

11. The Pay and Accounts Officer concerned is requested to open a new head of account in his books.

12. The Accountant General of Tamil Nadu is requested to make necessary book adjustment regarding the drawl of fund from the State Innovation Fund account.

13. This order issues with the concurrence of Finance Department vide its U.O.No.38622/Finance (Revenue)/2017, dated:31.07.2017.

**(BY ORDER OF THE GOVERNOR)**

**CHANDRA MOHAN.B.,  
SECRETARY TO GOVERNMENT**

**To**

The Principal Secretary and Commissioner of Revenue  
Administration, Ezhilagam, Chepauk, Chennai - 600 005.

The Principal Secretary, Planning Development and Special Initiative Department,  
Secretariat, Chennai - 600 009.

✓ The Member Secretary, State Planning Commission,  
Ezhilagam, Chepauk, Chennai - 5

The Principal Accountant General, Chennai - 600 018

The Pay and Accounts Officer (East), Chennai - 600 008.

**Copy to:**

The Additional Chief Secretary to Government,  
Finance Department, Chennai -600 009.

The Finance (Revenue/BG-I/BG-II/) Department,  
Chennai -600 009.

The Revenue (O.P.II) Department, Chennai - 600 009.  
SF/SC.

//FORWARDED BY ORDR//

  
SECTION OFFICER.

3/8/17