



Smart Sensors- Devices and Applied Systems (PS.0402, 0404, 0406)

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Deskripsi



Ruang lingkup RG ini adalah penelitian dalam bidang sensor, device dan sistem aplikasinya.



Dalam bidang sensor meliputi *how to make* dan *how to use*.



Pembuatan sensor berbahan sederhana hingga sensor yang berbasis semikonduktor.



Sedangkan penggunaan sensor dan sistem aplikasinya, meliputi penggabungan beberapa sensor untuk menghasilkan *smart sensor* hingga *fusion sensor*.

Research Area

(Smart Sensors-Devices Lab.)

Titania Based
Devices

Thermo Electric

Smart Sensors
and its
application

Titania Based Devices

Membuat Sensor yang berbahan dasar Titania (TiO_2) :

- Biological Oxygen Demand (BOD)
- Chemical Oxygen Demand (COD)

Photo Voltaic, Dye Sensitized Solar Cell (DSSC)

Thermo Electric

Berbahan dasar



CERAMICS



ALLOYING METALS



ETC

Monitoring dan Pemetaan Salinitas Air Tanah di pesisir Timur Surabaya (Studi Kasus di Wisata Hutan Magrove Wonorejo)

Akuisi data sensor salinitas air tanah

Monitoring salinitas air tanah berbasis WSN

Pemetaan salinitas air tanah

- Fungsi pasang surut air laut,
- Fungsi musim kemarau dan penghujan (pemetaan dilakukan setiap bulan)

Monitoring and Mapping of Groundwater Salinity on the East Coast of Surabaya (Case Study in Wonorejo Mangrove Forest Tourism Area)

Background:

- Agriculture
- Residence/Dwelling



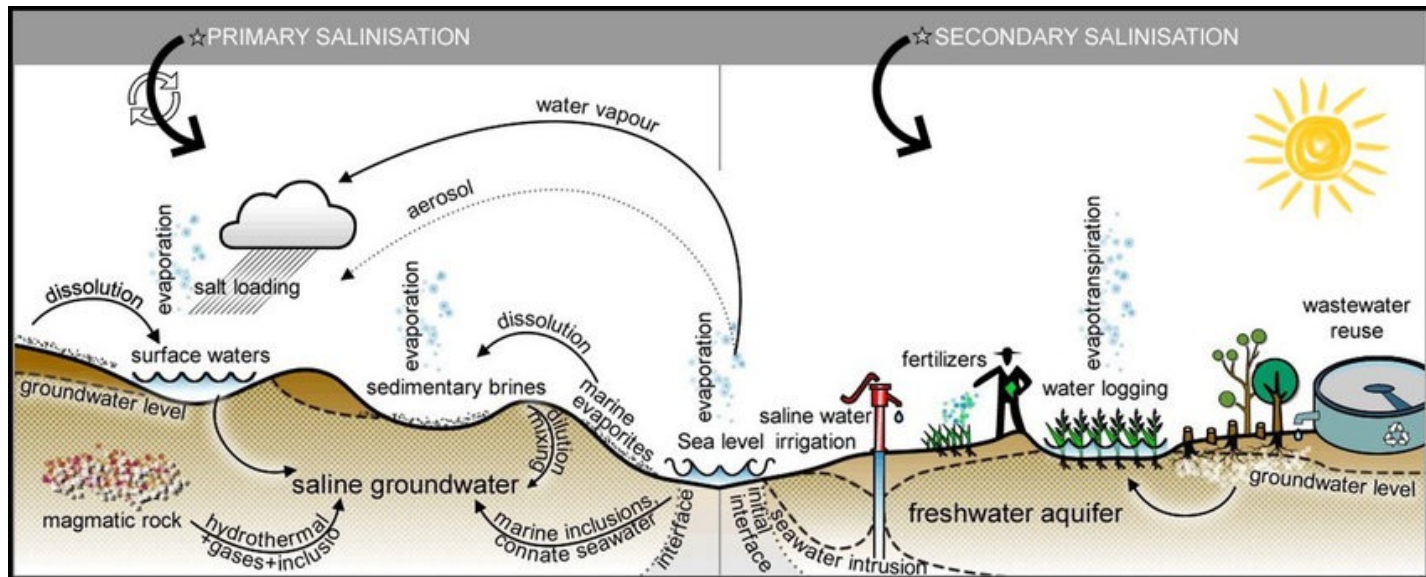
Source: <https://mediaindonesia.com/nusantara/249240/ratusan-hektare-padi-gagal-panen-akibat-intrusi-air-laut>



<https://www.bangkokpost.com/world/1720435/sinking-jakarta-needs-giant-sea-wall-indonesia-president>

Monitoring and Mapping of Groundwater Salinity on the East Coast of Surabaya (Case Study in Wonorejo Mangrove Forest Tourism Area)

Background:



Source: https://www.researchgate.net/figure/Processes-of-primary-and-secondary-salinization-of-soils-Source-Adapted-from_fig2_339340178

Monitoring pada Sistem Drainase Tertutup (Surabaya smart city)



Akuisisi data sensor (Flow sensor, level sensor, gas sensor, temperature sensor)



Monitoring



Early warning systems



Pumping systems Integration



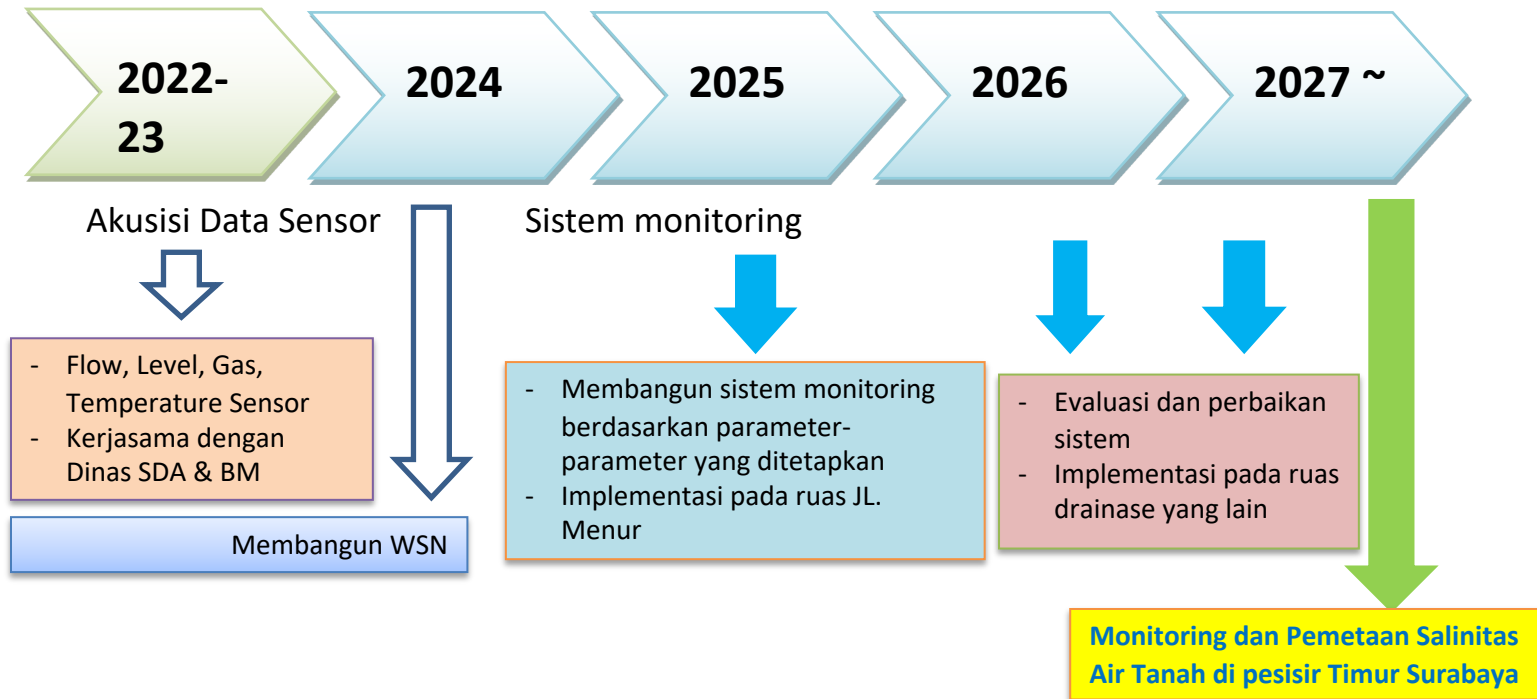
Sensor Fusion



Kerjasama dengan Dinas Sumber Daya Air dan
Bina Marga Kota Surabaya

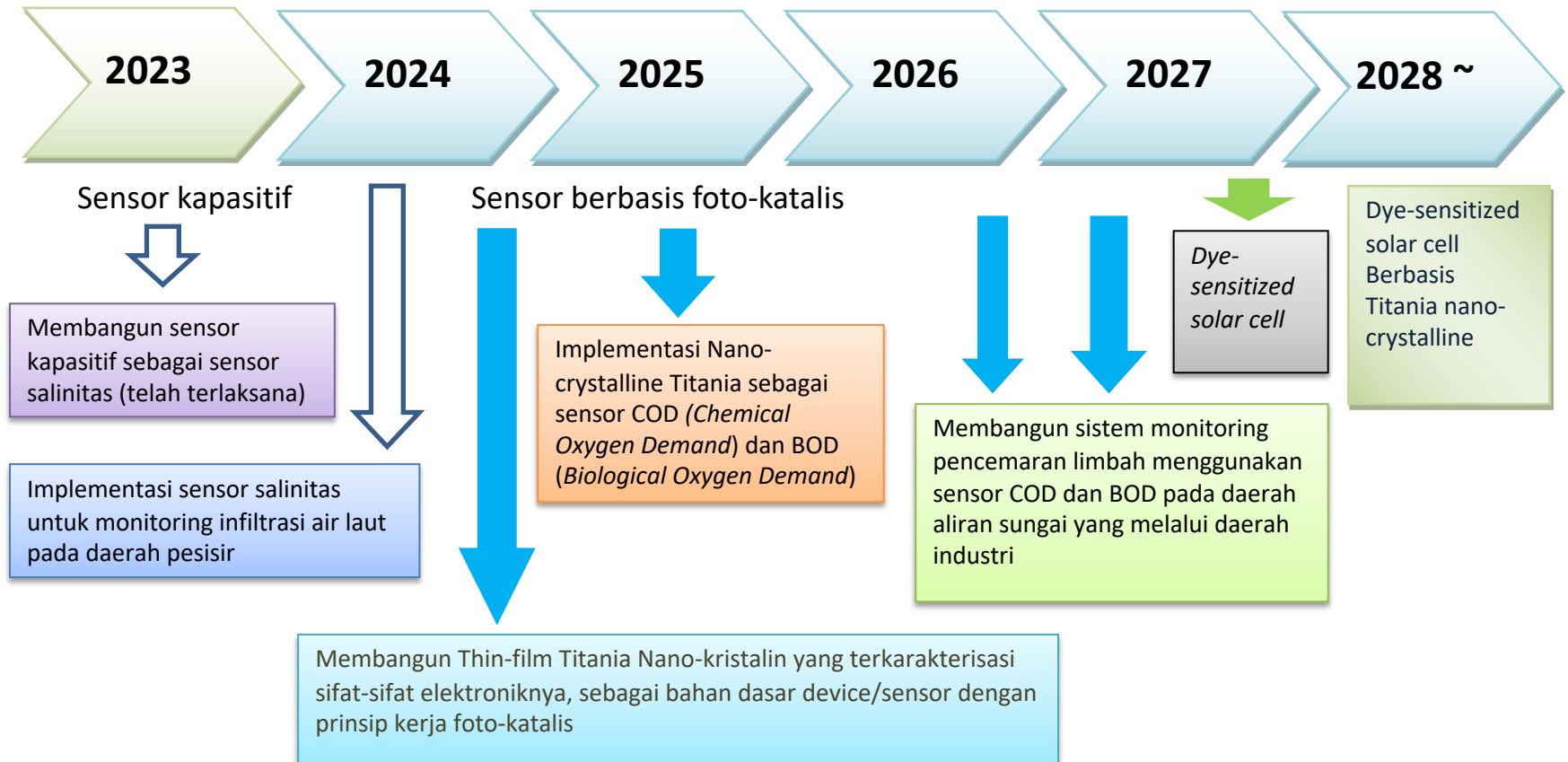
Road-Map

RG Smart Devices-Sensors and Applied Systems



Road-Map

RG Smart Devices-Sensors and Applied Systems

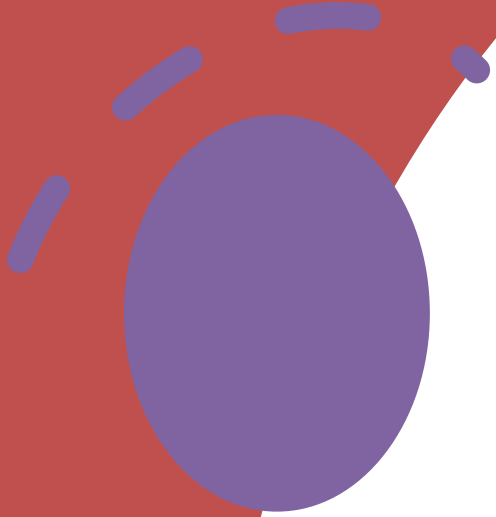


Teknologi Sensor dan Device serta aplikasinya

- Teknologi pembuatan Sensor
 - Resistif
 - Induktif
 - Kapasitif
 - Berbasis Semikonduktor
- Signal Processing
 - Characterization
 - Signal conditioning
 - Signal Processing
- Aplikasi
 - Penggabungan sensor
 - Pemberdayaan
 - Wireless Sensor Netwok (WSN)

Tema Riset

- Salinity Sensor
- COD Sensor
- Lead (Pb) Sensor concentrations
- Air Quality Sensor (WSN)
- Power Wireless Transmission
- Implementation Active Range of Motion Exercise Aid on Wrist and Finger Using Flex Sensor and IMU



Terimakasih