

**16th Meeting of the International Committee on Global Navigation
Satellite Systems (ICG-16)**

WG-B, Application Subgroup (AppSG)

**Report on AppSG Activities
“GNSS Applications: for Present and Future”**

**Dr. Jun Shen (China), Dr. Izumi Mikami (Japan)
The AppSG Co-chairs**

October 12, 2022



International Committee on
Global Navigation Satellite Systems

Faces of 5th AppSG meeting attendees Sep. 9, 2022



From the ICG-15 Joint Statement

18. The Working Group recognized the efforts made by its application subgroup.
Based on the joint statement of the fourteenth meeting of ICG, the application subgroup proposed to start a new initiative entitled “GNSS applications: for present and future”, to survey GNSS applications that identify challenges and facilitates the development of solutions that serve society. These actions were intended to provide assistance, lessons learned and guidance to GNSS users. This initiative would lead to a research report entitled “GNSS applications for sustainable development: case studies”.
19. Further enhancements were identified to create opportunities for greater participation and to attract new contributions to the application subgroup. All members of the working groups were encouraged to take a proactive role in support of this new initiative of the application subgroup.
20. The application subgroup intended to participate in important GNSS conferences and events to promote GNSS application development and to obtain information about trends in GNSS applications in line with the new initiative. *The subgroup also intended to support the workshops on the applications of GNSS of the Office for Outer Space Affairs.*

Record of AppSG Activities

Activity	When	Who	Major Result
Workshop on GNSS Applications of Office for Outer Space Affairs	Oct 29, 2021	Co-chairs*, C, E, I, J	<ul style="list-style-type: none"> • Introduce AppSG activities and • 5 presentations of GNSS applications were made
AppSG meeting planning	Dec 2021 -Mar 2022	Co-chairs	<ul style="list-style-type: none"> • Set up interstate rotational role of the AppSG annual meeting arrangement • The study area selection method was investigated.
Meeting #1	Apr 11, 2022	J*, C, E, I, K (15)	<ul style="list-style-type: none"> • Discussed focused study areas of GNSS applications towards SDGs, select the initial focused area to mitigate global warming effect • 6 presentations made
Meeting #2	May 3, 2022	C*, E, I, J, K (17)	<ul style="list-style-type: none"> • Discussed how to define narrower study areas at cross of SDGs and global warming • 1 presentation made
Meeting #3	Jun 29, 2022	E*, C, I, J, K (16)	<ul style="list-style-type: none"> • Continued to investigate the potential study areas, 6 presentations made
Meeting #4	Aug 3, 2022	I*, C, E, J, K (17)	<ul style="list-style-type: none"> • Discussed and agreed on study area for SDGs +global-warming, basic booklet template and depth of description • 3 presentations made
Meeting #5	Sep 9, 2022	J*, C, E, I, K(15)	<ul style="list-style-type: none"> • Agreed to include GNSS+EO app and GNSS applications not on the market but under final development • 2 presentations made

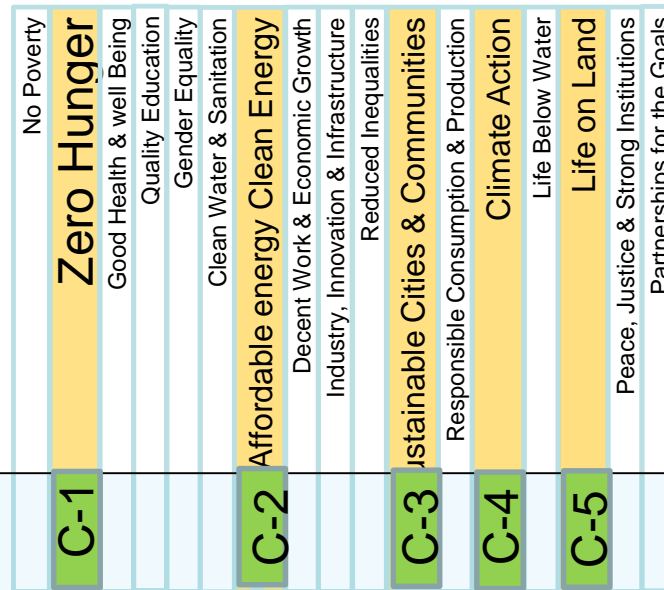
*: Meeting host;

C-China, E-EU, I-India, J-Japan, K-Korea

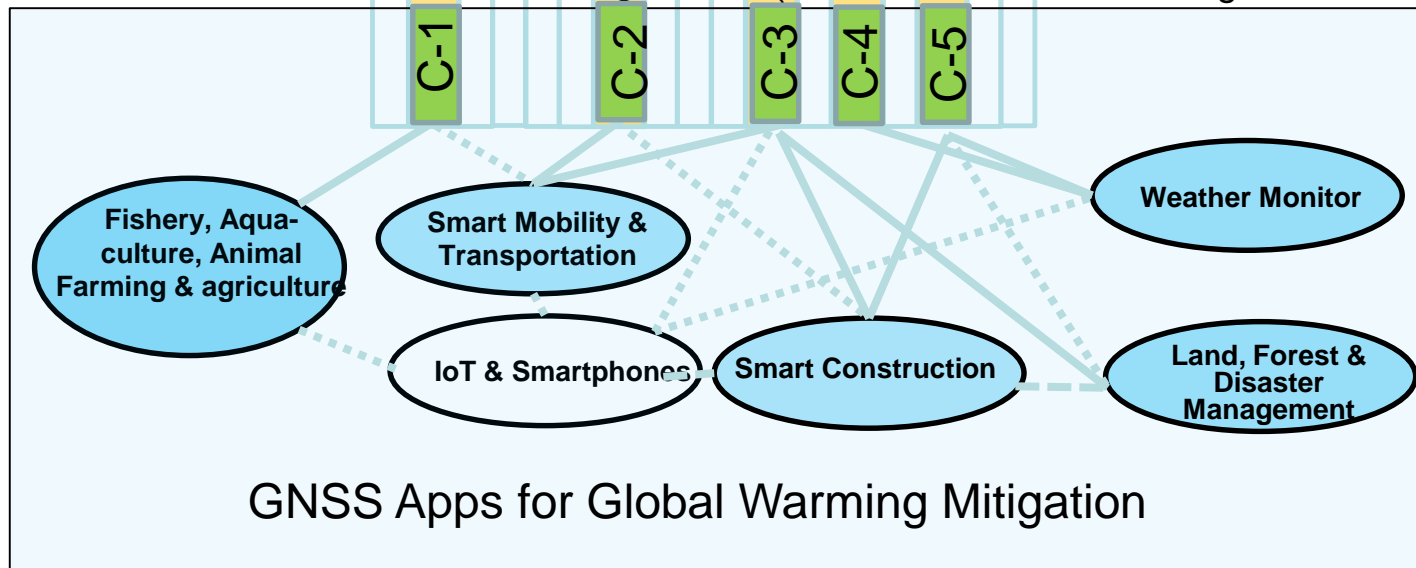
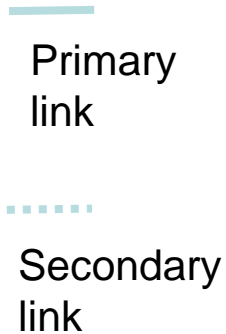
Study Areas Defining at Major Overlaps in SDGs & G-Warming

17 SDGs

Purpose:
Narrow down study areas of GNSS application cases

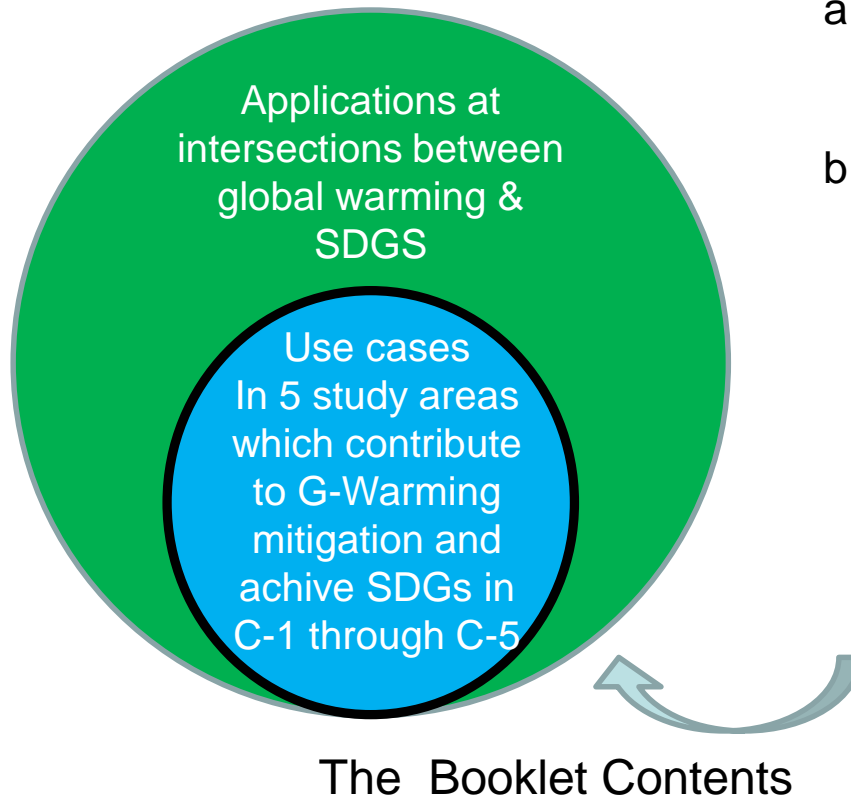


- 6 study areas which contribute to G-warming mitigation
- Selected 5 study areas which contribute to both SDGs and G-warming mitigation



GNSS Application Use Cases and Study Areas to be Introduced in the Booklet

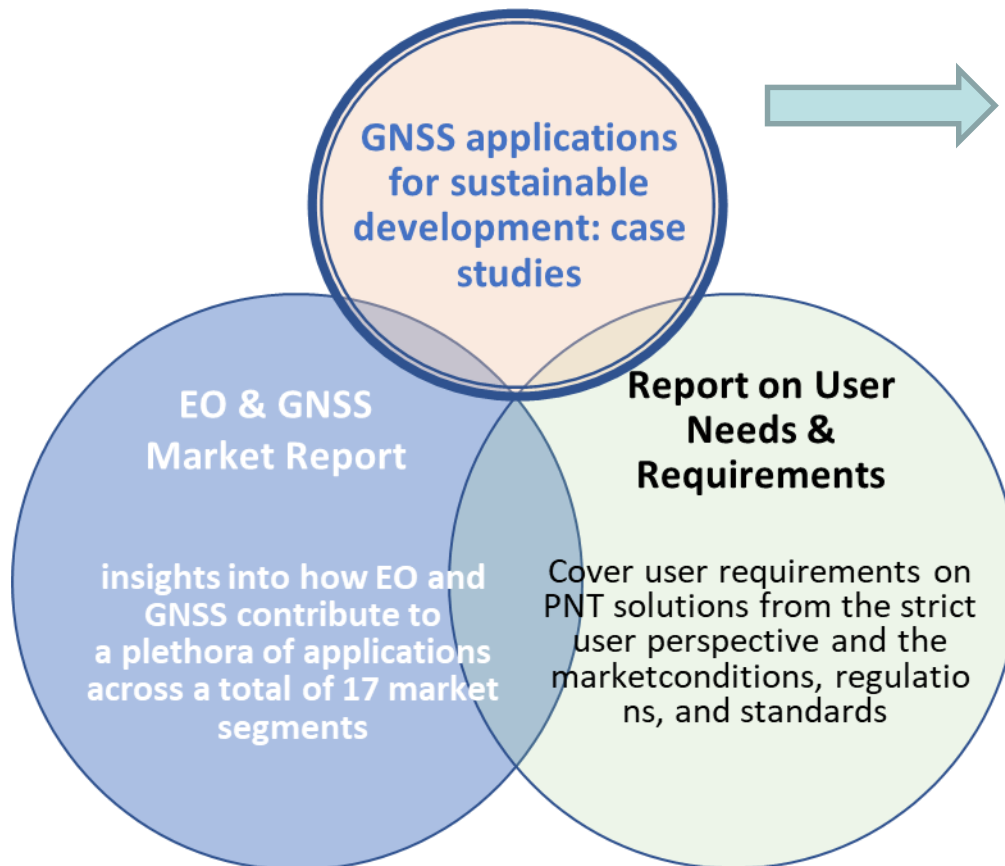
Title: *“GNSS applications for sustainable development: case studies”*



- a. Put less importance on the well-known, well studied applications such as autonomous cars, machines, etc.
- b. Select and introduce GNSS application use cases which are,
 - unique, less well-known and contribute significantly to SDGs by solving societal problems at C-1 through C-5 in 5 study areas, and
 - able to provide lessons learned and guidance for current and potential GNSS users and motivate them to use the introduced products, systems, and services, or develop own GNSS business.

The Intention of the Booklet

To provide lessons-learned and guidance for GNSS users



1. Contain GNSS application cases towards SDG's and global warming mitigation based on actual products, services, and systems currently available on the market and under final development in each member state.
2. Include system diagrams, specifications, etc. as simple as possible.
3. Highlight how such applications were developed, why GNSS and its specific services are chosen, and stories including challenges encountered and solutions found.

Table of Contents of the Booklet (Draft)

- Foreword
 - Introduction
 - Application Subgroup and its Activities as a part of ICG WG-B
- Purpose
 - Provide assistance, guidance and lessons learned for current & potential users of GNSS to utilize GNSS applications on the market and/or encourage them to develop their own GNSS
 - Introduce GNSS applications toward SDGs and mitigation of global warming effect
 - Provide readers a guide on how to read easily
- GNSS application use cases in study areas selected to achieve SDGs and mitigate global-warming effect
 - Construction
 - Fishery, Aqua-culture, Animal farming and Precision Agriculture
 - Mobility & Transportation
 - Land, forest & Disaster Management
 - Weather Monitoring
 - Others
- Introduction of GNSS
 - Introduction of global and regional satellite constellations for PNT in service
 - Principles of Positioning per accuracy and utilization of messaging services
- Annexes
 - List of acronyms
 - Authors' information

The Presentation Template

Item	Contents
Contribution areas to SDGs and Global Warming effect mitigation	Select contribution area(s) from C-1 through C-5
Study area	Select relevant study area(s)
Societal problems to be resolved	Describe societal problem(s) if any in addition to the above, its background, and how GNSS is chosen as a solution
Product/Service name	Name, Product No., etc. to an extent applicable
Manufacturer/Provider/Developer	Name, contact address, e mail, url, etc.
Date of Product/Press release, In-service	Month, and year (expected release timing for cases under final development)
Used GNSS service	Range signals, augmentation service, timing, message, etc.
Price range	Describe if applicable
System description, diagram, specification, etc,	Describe the working of system, the type of GNSS services utilized, and the problems resolved using specifications and the top level system diagrams, etc.
Lessons learned and guidance to GNSS users	Describe challenges and solutions to overcome, new findings in utilizing GNSS services, and how much improvement was achieved, etc.
References	Show HP, url of press release, catalogue, published papers, etc. available in internet

Time Schedule for the Booklet Development

	2022				2023			
	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4
SG meeting		J ▽ C ▽ E ▽	I ▽ J ▽	▽ ▽ ▽	▽ ▽ ▽	▽ ▽ ▽	▽ ▽ ▽	▽
Report to WG-B				ICG-16 ▽		ICG-IM ▽	ICG-17 ▽	
Contribution to UNOOSA WS				↑ TBD ▽		↑	↑	TBD ▽
Advertisement at International Conf.								
Booklet Publication		▽ Kick Off Fix Presentation Template	▽ Select Study Area	▽ Set Table of Contents Accumulate Presentations on GNSS App & Publish 1 st Draft		▽ Edit for 1 st edition Booklet	▽ Publish 1 st edition	