NUML SDG SCOUTS

SMART SUSTAINABLE CITIES

Minor Progressionists aspire to bring off sustainability in urbanization through modern infrastructures, technologies & accessibility to all

PROJECT SUPERVISOR
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SOCIAL ACTION PROJECT

Social Action Project Smart Sustainable Cities

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PREFACE:

The concept of smart sustainable cities has gained significant attention in recent years to address the growing challenges of urbanization. With a rapidly increasing population and the associated strain on resources, it is essential to develop innovative solutions that can improve the efficiency and sustainability of our cities.

This report aims to provide an in-depth examination of the key components of smart sustainable cities, including the use of technology, data, and design to enhance livability, reduce environmental impact, and promote economic growth. Additionally, we will explore the challenges and opportunities that cities face in implementing smart sustainable solutions, as well as case studies of successful implementation.

We have included many thoughts in this project report, quickly leading to minute details of our considerable effort. We gained a lot of expertise with numerous tactics that can be used to develop our project while working on it. This initiative will serve as a steppingstone in our professional careers.

We hope that this report will serve as a valuable resource for policymakers, urban planners, and researchers as we work towards creating more livable and sustainable cities for the future.

ACKNOWLEDGEMENTS:

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We want to thank the Department of Governance and Public Policy, National University of Modern Languages (NUML), Islamabad, for providing us with this amazing social action project titled "Smart Sustainable Cities-SSC."

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Last but not least, we extend our thanks to the students of the Governance and Public Policy Department for their encouragement and support.

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1. PROPOSAL:

Social Action Project

"SDGs SCOUTS FOR SMART & SUSTAINABLE CITIES"

Introduction:

We are **"NUML SDG SCOUTS",** students of **GOVERNANCE AND PUBLIC POLICY, NUML ISLAMABAD,** doing social action project on "**smart sustainable cities**" under the supervision of **DR. ATHAR RASHID.** We aim to promote smart and safe cities.

- **Smart Cities:**

A smart city is a technologically modern urban area that uses different types of electronic methods and sensors to collect specific data. Information gained from that data is used to manage assets, resources and services efficiently. In return that data is used to improve operations across the city.

Sustainable cities and communities are the 11th SDG devised by the united nation to make cities and human settlements inclusive, safe, resilient, and sustainable.

- **Our Aim:**

Our aim is to advocate the importance of smart cities and making citizen smart/digitally literate. We selected this project because there is dire need of countries to build smart cities to make the future of cities sustainable. The target is to educate people to move towards smart, sustainable, and affordable living style.

- **Data or Stats:**

Statistically more than half of the world population lives in cities. Sustainable development cannot be achieved without the management of urban spaces. The issue of rapid growth in cities is a result of rising population and increasing migration.

- In 2018, 4.2 billion people 55% of the world population lives in cities.

- By 2050, the urban population is expected to reach more than 6.5 billion.
- 828 million people are estimated to live in slums and the number is rising.

Making cities smart means creating career and business opportunities, safe and affordable housing and building resilient societies and economics. It involves green public spaces and improving urban planning and management in participatory and inclusive ways. The aim of this project is to create awareness and guide people about new innovative ideas regarding smart communities.

Group Members & their roles:

- Haseeb Saleem Awan

  Project Manager

- Wareesha Shakeel

  Coordination Manager

- Sahar Khushbakht

  Content Manager

- M. Usman Zafar

  Media Manager

- Sharafat Naz

  Finance Manager

Location/ Area of project:

- The location/area of this social action project is **Federal, Punjab** and **KP**.
- We will visit **the Ministry of Interior Urban development Authority, Housing Societies, Electric and Water supplier companies** and **NGOs for development of smart sustainable cities.**

Duration of Proposed project:

We started this project in **Decemeber'2022.** We have a one-year plan to make this project feasible and it will end in **December'2023.**

Beneficiaries:

- Children
- Teenagers
- Young people
- Older people
- Women
- Men
- Person with disabilities
- It can help government institutions, organizations and businesses working on urbanization.

Local available resources:

- Ministry of Interior Urban development Authority
- Housing societies
- Electric and Water supplier companies
- NGOs for the development of smart sustainable cities.
- Webinars
- Interviews and Surveys

Social Media:

- Facebook
- Instagram

Equipment:

- Laptop
- Camera
- Mobile phone
- Pena flex, Booklets and Posters

Benefit for the community:

Unregulated housing societies and urbanization is a big challenge for Pakistan in terms of social and economic progress. Pakistan lacks housing policies and planning. In Islamabad alone there are 224 housing societies out of which only 14 are registered. Also, there is a lack of political will along with the lack of policies.

Need:

The important reason behind smart cities is to make the future of cities sustainable. “As the term sustainability indicates the uses of resources to meet the need of present without compromises the needs of future generations”

The smart city concept describes the ability and increase the capacity of community to create a solution for challenges and make it a more livable place for all. On the basis of the required data, Pakistan is in the critical stage. Pakistan needs to make a comprehensive housing policy. Both technological and behavioral transformation is needed. The behavior practices include the change of mind of people making them smart and aware them of the benefits of smart cities. On the other hand, technology includes a comprehensive and strict housing policy, use of innovative ideas and technologies and making them eco-friendly. In this age of modernization there is a need to use technology. By using technology, it saves resources, is affordable to all and meets with the international standard.

Objectives:

- To Advocate the importance of smart cities.
- To organize awareness campaigns in various institutes to educate people about the importance of Smart Sustainable Cities.
- To make buildings easily accessible for PWDs using IoTs.
- To encourage business and investment sectors to take responsibility of making city projects Smart and Sustainable.
- To involve concerned government stakeholders in making policies regarding Sustainable planning in urbanization.
- To enhance awareness about information and communication technology.
- To make citizens smart/digitally literate through different webinars.
- To change the behavior/mind of individual concerning betterment of their own lives and community.
- To organize events and activities targeting all community members that encourages continuous action.
- To meet with administration of housing societies for addressing the solution.

Feasibility:

This project is absolutely feasible to work on.

- We will take initiative through Facebook and Instagram accounts for advocacy of smart cities and to make smart citizens for smart cities.
- We will conduct webinars that will address different topics like concept of smart cities, role of ICT and the importance of smart citizens.
- We will be conducting awareness campaigns to educate common citizens and the concerned authorities.
- For funding of our project, we will collaborate with the organizations working for the advocacy of Smart Sustainable cities.
- We will collaborate with NGOs working for the rights of PWDs for smart and accessible modern infrastructures.
- We will involve groups from the IT sector to work on smart sustainable approaches.
- In the long term we will collaborate with traffic police authorities to install sensors and new technologies on roads in terms of providing safe and sustainable cities.

Methodology/Approach:

1. We will collaborate with the companies providing Solar Pannels which use solar energy to meet the needs of buildings and societies.
2. We will collaborate with traffic control authorities for the installment of modern technologies in various sectors I.e., detectors on roads.
3. We will emphasize the concept of Internet of Things and use of smart technology to smart cities.
4. We will conduct interviews with executives and collect data by asking questions.
5. Discovering technologies in collaboration with IT experts through which houses and buildings can be controlled.
6. Awareness through banners and posters.
7. Meetings with the Administrative Directors and Authorities of the cities.
8. We will be visiting housing societies.
9. We will collaborate with NGOs to uplift the cause.
10. We will visit the ministry concerned with urban development.
11. We will arrange a seminar for the advocacy of Smart Sustainable Cities.
12. Meetings with PWDs, asking them about the difficulties they have to face in buildings, offices and societies for not being smartly accessible.

13. We will visit the Ministry of Environment and Climate Change.
14. We will conduct interviews.
15. We will do various case studies of societies outside and inside ICT.
16. We will make posters for the promotion of our message in society.
17. Different awareness drives for the advocacy of smart cities.
18. Surveys and questionnaires.
19. Organizing webinars.
20. Launching social media campaigns.

Continuity:

- We will keep our social media pages active.
- This program will stick to its message, have a well-defined plan, and devote all of its human resources to it.
- Our project will last longer than the semester.
- We plan to grow our team by bringing on additional volunteers and collaborating with various organizations.

Outcomes:

By the end of this project, we would have:

- Realization of the educated lot regarding the significance of Smart and Sustainable development.
- Accessibility to PWDs.
- Smart Homes and Home Automation.
- Less harm to the environment.
- Conservation of Energy and Resources.
- Self-Sufficient Buildings covering needs of water and electricity at their own.
- Changing mindset of people.
- More digitally aware citizens.
- Promotion of Information and communication technology.
- Highlighting the importance of smart cities.

Measuring tools:

The impact and success of the project will be measured with the:

- Questionnaires
- Social media pages
- Public interviews
- Feedback forms
- Activities carried out

2. SOCIAL ACTION PROJECT:

A social action project is a step-by-step approach for addressing a social problem. It is carried out collaboratively by a group of people who observe a problem and take actual steps to resolve it. Students are prepared to recognize societal challenges through Social Action projects. It encourages students to think critically and come up with logical answers to difficulties. Students gain practical experience in society through the Social Action project. It aids in the development of vital abilities such as cooperation, empathy, critical thinking, and problem solving, among others. It made them realize that our actions have consequences in society. The project entails social action.

2.1 BENEFITS OF SOCIAL ACTION PROJECT

People get together through the Social Action initiative to help better their lives and solve problems that are relevant in their communities. Small constructive deeds can have a significant impact on society. Volunteering, monetary gifts, community service, or simple neighborly deeds can all be examples.

The following are some of the benefits of the Social Action programmed.

It has the ability to energize and empower populations that have been traditionally weak or have not realized their own power potential. It contributes to society's unity. It fosters a sense of community and shared effort, and it brings individuals together in pursuit of a common goal.

Character and self-assurance develop in young people. They have a higher sense of self-worth, which can help them improve their mental toughness. They also gain valuable skills and connections that will assist them in finding work in the

future. It has the capacity to motivate others to pursue other positive actions. When people observe the benefits of social action programs, they are more willing to take on additional actions. They begin to realize that they can solve many of their own difficulties and get the motivation and confidence to do so.

3. OVERVIEW OF THE PROJECT:

Smart Sustainable cities is a social action project with a sole motive of advocating the importance of building smart cities in Pakistan and promoting the concept of Smart Citizens for smart cities.

Moreover, we are working on different objectives like to promote the value of smart cities. To raise public understanding regarding the use of information and communication technology.

Through various webinars, citizens will become smarter and more digitally literate. Individuals' behavior/thoughts regarding the betterment of their own lives and communities must be changed.

To plan events and activities that will engage all members of the community and urge them to take action on a regular basis.

We learned many skills from this project as this was our first ever project. Moreover, we worked together as a team and learned to be more patient and humbler with one another.

4. ACTIVITY SCHEDULE:

Serial number	Date	Activity details
1.	Dec 15'2022	Visit to SKANS school of Accountancy
2.	Dec 16'2022	Visit to IMCB, I-8/3
3.	Dec 20'2022	Visit to IMSB, F-6/2
4.	Dec 21'2022	Visit to Tameer e Watan college
5.	Dec 23'2022	Conducted a Webinar in collaboration with Fatimah Jinnah Women University
6.	Dec 24'2022	Visit to Federal SDGs Unit, Ministry of Planning and Development
7.	Dec 27'2022	Visit to HEC, Meeting with Director Academics HEC
8.	Dec 29'2022	Awareness Campaign in National University of Modern Languages, Islamabad
9.	January 04'2023	Meeting with Chairperson Federal SDGs Unit
10.	January 06' 2023	Visit to PCRWR, Islamabad
11.	January 07' 2023	Visit to Kohistan Enclaves
12.	January 20' 2023	Visit to Canopy Resorts Kalam, Head Office, Blue Area, Islamabad
13.	January 07' 2023	Visit to Capital Smart City

5. LITERATURE REVIEW (25 RESEARCH PAPERS)

SMART CITIES:

According to Bibra and Krogstad (2020), a city becomes smart when it is able to develop and implement creative solutions that are based on cutting-edge technologies and cutting-edge scientific knowledge. According to global experience, the rate of urbanization expansion is slow up to 30%, but beyond that, at least up to 60%-65%, the rate of growth accelerates significantly. As a result, the rate of urbanization would accelerate in order to meet the needs of the people who live in those cities.

In 2015, the United Nations created the Sustainable Development Goals, which aim to foster peace and prosperity for people and the planet in the present and future. As a result, 17 goals were formed, with the intention of serving as an urgent call to action for governments around the world. Ending poverty and other deprivations must be combined with initiatives to promote health and education, decrease inequality, and spur economic growth, all while combating climate change and safeguarding our forests and oceans, according to the SDGs.

ENERGY MANAGEMENT:

"Smart Energy Meters" should be utilized to manage energy in "Smart Cities." It will regulate energy demand, lower costs, and reduce pollutants, making the environment more environmentally friendly. Obviously, IT assistance is required, as well as an emphasis on "Smart Grid." It features a monitoring system that keeps track of all the electricity that flows through the system. (Kar & Chatterjee, 2015).

HEALTH HAZARD MANAGEMENT:

An online health consultation system should be implemented. The procedure should be basic enough that ordinary individuals may handle it without difficulty.

Social Action Project Smart Sustainable Cities 23 It would lower the cost of living and make individuals nearly immune to health risks. (Kar & Chatterjee, 2015).

URBAN UTILIZATION:

Rapid urbanization has resulted in severe traffic congestion, pollution, increased risks of road accidents, and higher energy expenses. It's important to remember that getting about cities and going from one area to another is essential. To preserve a pollution-free environment, "Smart Cities" should place a strong emphasis on walkability and cycling throughout the city. It is necessary to have a good freight movement facility. (Kar & Chatterjee, 2015).

WATER SUPPLY:

Water should be readily available in "Smart Cities." The inhabitants' demands for dual water supply, such as drinking water and water for other purposes, will be met. Water use will be measured by "Smart Water Meters" that will be installed. This will encourage people to be more cautious about using more water than they need. (Kar & Chatterjee, 2015).

SANITATION:

A lack of sufficient sanitation will result in epidemics, health risks, and an increase in the city's death rate. The notion of a decentralized sewage and solid waste management system should be used to develop a city-wide sanitation plan. (Kar & Chatterjee, 2015).

POWER:

"Smart Cities" must have universal access to electricity 24 hours a day, seven days a week. As a result, renewable energy sources should be used. To regulate demand, a "Smart Grid" will be built and integrated with renewable energy sources.

STORM AND RAINWATER HARVESTING:

In the absence of storms and rainwater drains, water piling on roads occurs, endangering public health and leading to the emergence of infectious diseases. It should also be mentioned that storms and rainwater drains are still connected to the sewerage network in some places, rendering the system inefficient. In "Smart Cities," this should be checked.

SMART CITIES; LEARNING APPROACH IN SMART HEALTHCARE:

Smart city is a collective term for technologies and concepts that are directed toward making cities efficient, technologically more advanced, greener and more socially inclusive. These concepts include technical, economic and social innovations. This term has been tossed around by various actors in politics, business, administration and urban planning since the 2000s to establish tech-based changes and innovations in urban areas. The key focus is on dealing with challenges faced by urban society, such as environmental pollution, demographic change, population growth, healthcare, the financial crisis or scarcity of resources. In a broader sense, the term also includes non-technical innovations that make urban life more sustainable. So far, the idea of using IoT-based sensor networks for healthcare applications is a promising one with the potential of minimizing inefficiencies in the existing infrastructure.

SMART CITIES: INTEGRATING MODERN BIOENERGIES

Smart cities are characterized by smarter urban spaces, as well as the use of technologies to manage traffic, pollution and poverty issues. The concept of a smart city is closely linked to the concept of smart energy city. The use of biofuels has increased due to the increased demand to replace fossil fuels, reducing greenhouse gas emissions into the atmosphere and preventing global warming. Within the city of Aberdeen, Scotland, there are a number of buildings that use biogas-fired power plants. The Ruhr region in Germany has interconnection between trans-regional networks allows industrial waste to be transformed into heat. Tallinn, capital of Estonia, has become a smart city in recent years. Smart city is defined by accessibility, interoperability and ease of use. In addition to digitization, Tallinn also has thermal and electric power generation systems that protect the environment. More than 98% of households in the city are connected to the centralized system of heat generation.

SMART CITY STRATEGY IN DEVELOPING COUNTRIES:

The right strategy for cities in developing countries must be in accordance with the uniqueness and potential of each city. It is very important to also pay attention to human resources, both for staff and operators who operate various systems installed in smart cities (Wang et al., 2021). There are various factors that must be considered in formulating a smart city strategy. Budget support is an important factor as an instrument in smart city financing. In developing countries, limited budget conditions create obstacles to the decline in the quality of infrastructure and the implementation of smart city applications.

TRANSITION TO SMART, SUSTAINABLE CITIES:

"Smart cities" may present challenges to the goal of governance, which is to be transparent, inclusive and citizen centric. Smart cities hold the potential to make important contributions to environmental sustainability, but they must not

neglect dimensions of cities that include spiritual, historical and aesthetic significance.

MUNICIPAL INFRASTRUCTURE USING SMART CITY TECHNOLOGIES:

Sustainable development of a big city within the SC framework is a multilateral process. A city's sustainability directly depends on all constituent elements of the city's socio-economic system. (Business entities, non-governmental institutions, numerous public or private organizations and associations). A city's unemployment rate assessed value of commercial and industrial properties, percentage of people living in poverty and the number of businesses per 100,000 population was compared to its nearest neighbor. Key areas for further development include improvement of residents' quality of life, modernization and development of the technological infrastructure of the city.

LIMITS OF SMART SUSTAINABLE CITIES:

Smart comes with implications for the resilience of urban infrastructures and other machinery of everyday life. Already today minor power blackouts can cause substantial harm, as can failing ICT systems. Both academia and the business sector express concerns regarding the mere number of raw materials needed to smarten our planet. ICTs can be used to improve energy reliability in a future with more renewable and intermittent energy. But they can also end up requiring more energy and resources than they save. Modern ICT is dependent on rare materials, which in themselves set limits for the number of devices that can be installed.

STRATEGIES & PATHWAYS FOR ENERGY EFFICIENCY SOLUTIONS:

Modern cities play a leading role in sustainable strategic development. They have a central position in developing and applying advanced technologies. Smart Cities are making massive use of information and communication technologies. The rate at which technology is currently being implemented is on the increase, according to the World Bank. Smart grid specifics are starting to emerge from the marketing haze. In a smart grid, utilities manage their electrical supply and productivity cost-effectively. Customers benefit from a more efficient power system. This article focuses on the main strategies of resource efficiency management associated with smart grid and sustainable cities.

IMPORTANCE:

Many elements are necessary for the establishment of "Smart Cities," and funds are required to meet these criteria. Again, knowledge of the cyber world is required to reap the benefits of "Smart Cities." This knowledge cannot be acquired by someone who is illiterate. As a result, recipients must be digitally literate in order to reap the full benefits of "Smart Cities," where ICT is required. Pakistan is not a wealthy nation. The majority of the people here are poor. Poverty hampered their ability to become literate in general, let alone in digital learning.

SMART, SUSTAINABLE, ACCESIBE & INCLUSIVE CITY FOR PERSONS WITH

DISABILITIES:

In the smart city, smart accessible infrastructure creates an inclusive environment for people with disabilities. People with disabilities have the same basic needs as everyone else: health protection and treatment, basic services, housing and income. Targeted intervention measures need to complement disability mainstreaming. Smart city planning can help to improve the quality of life for all people, especially those with disabilities - especially those living in cities.

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- Towards Smart, Sustainable, Accessible and Inclusive City for Persons with Disability by Taking into Account Checklists Tools https://www.scirp.org/journal/paperinformation.aspx?paperid=102526

6. WEBINAR:

6.1 INTRODUCTRY WEBINAR ON SDGs 1-5 AND SMART SUSTAINABLE CITIES, ITS NEEDS AND CHARACTERISTICS:

An Introductory webinar was arranged by the team 'Smart Sustainable Cities-SSC' in collaboration in Fatimah Jinnah Women University, Rawalpindi.

The topic of the webinar was 'Smart Cities and their Characteristics'. It was hosted by Maria Jan and Wareesha Shakeel. The group members of SSC presented the topic with the help of slides. The motive of the webinar was to make people familiar with the general concept of Smart Cities.

It was an absolute honor to do this interactive session in collaboration with FATIMA JINNAH WOMEN UNIVERSITY, department of PUBLIC ADMINISTRATION, under the supervision of Dr. Athar Rashid.

We are very grateful to Dr. Fiaz Hussain; Associative professor FJWU, department of PA.

Special Acknowledgements to: Dr. Zain Rafique; Assistant professor GPP, NUML.

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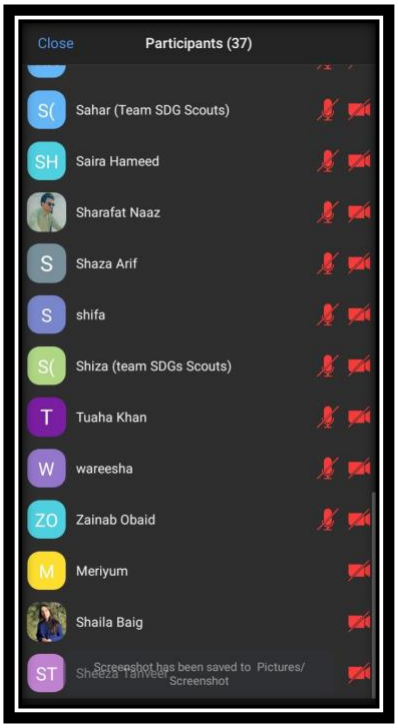
WEBINAR
A webinar by NUML SDG'S Scouts in collaboration with FATIMA JINNAH WOMEN UNIVERSITY RAWALPINDI
23 December, 2022
11:00 AM - 11:45 AM
meet.google.com/two-vasb-hzr
OUR TOPIC DISCUSSION:
Sustainable Development goals Agenda 2030
An awareness session on Sustainable Development Goals 1-5
MARIA JAN
SPEAKER
WAREESHA
SPEAKER

Fiaz Hussain_FJWU to Me (Direct Message)
FH
Thank you Wareesha for arranging this Webinar. please convey my sincere thanks to Dr Athar and Dr Zain also
Me to Fiaz Hussain_FJWU (Direct Message)
Sure Sir. we are also very grateful to you for providing us the opportunity
Send to: Fiaz Hussain_FJWU
Tap here to chat or tap a message to


Close
Participants (37)
Sahar (Team SDG Scouts)
Saira Hameed
Sharafat Naaz
Shaza Arif
shifa
Shiza (team SDGs Scouts)
Tuaha Khan
wareesha
Zainab Obaid
Meriyum
Shaila Baig
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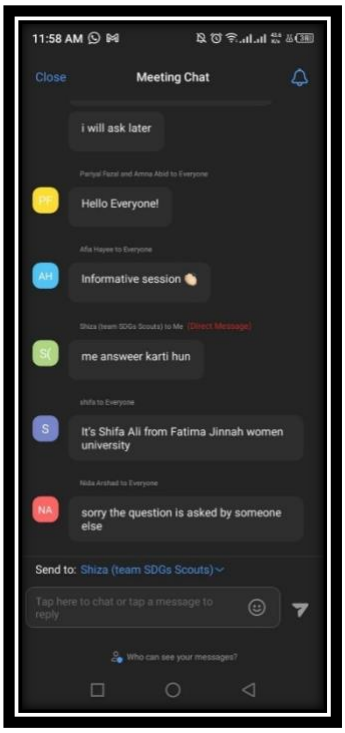
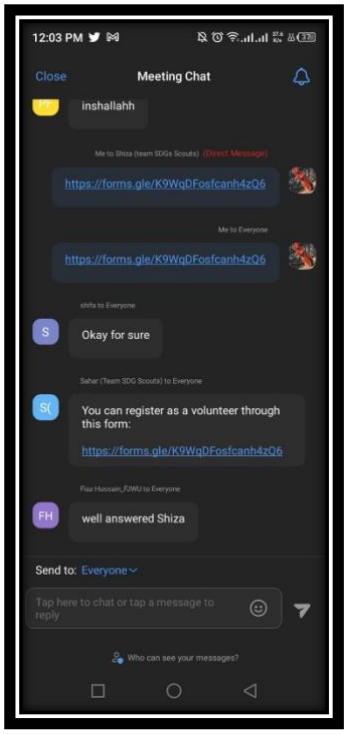




7. VISIT TO SKANS SCHOOL OF ACCOUNTANCY:

We conducted an Awareness Seminar regarding Sustainable Development Goals, Agenda 2030 and the concept of Sustainable and Accessible infrastructures at SKANS in which students as well as management participated.

AIMS AND OBJECTIVES

•To Aware, Educate & Train young students regarding Sustainability and accessibility for all

•To make them understand the concept of Sustainability in terms of social, economic and environment aspects

•Brief introduction of 17 Sustainable Development Goals

•Background knowledge about MDGs and the requirements of the society in which we live in

•To Aware them regarding alarming situation towards which we are moving as a nation.

Our focused SDGs areas were:

•ACCESSIBILITY FOR PWDs

•ENERGY CONSERVATION

•RESOURCES CONSERVATION

•SECURITY FOR ALL

FEEDBACK:

•The overall feedback was great and so overwhelming. The students of Accountancy showed a huge interest in the Governance issues which we are facing regarding the achievement of the 2030 Agenda.

•We also had a very interactive Q&A session with the students in which they actively participated, and we were able to clear their concepts. It was a very constructive session.

AMBASSADORSHIP:

A number of students contacted us individually to become SDGs Ambassadors for SDGs SCOUTS. We acknowledged their interests and encouraged them to work with us for the betterment of our country and to conserve our resources. Certifications will also be provided to the students.

ACHIEVEMENTS:

We got Appreciation Certificates from the institute of Accountancy.

• The management appreciated our work to a great extent and gave us few suggestions

•We also had a very successful meeting with ***Miss Maria Akhtar Ali*** -Manager Students Training & Placement

NUML SDG SCOUTS
SKgraphics
15-Dec-2022, 14:34

SKgraphics

SKgraphics
15-Dec-2022, 14:34

8. VISIT TO IMCB, I-8/3:

We conducted an Awareness Seminar regarding Sustainability and Sustainable Development Goals with the students at school and college, under the supervision of Dr. Athar Rashid. It was a very interactive session. The students responded so well and were actively participating in a healthy discussion.

The Principal, Teachers and management of the school cooperated with us to a great extent. They also encouraged our efforts at this level and promised us a letter of Acknowledgement and further collaborations with the institute in this regard. We are so grateful to everyone including our Project Supervisor.

9. VISIT TO IMSB, F-6/2:

NUML SDGs SCOUTS GROUP-1 visited IMSB, F-6/2 on December 20'2022; Tuesday Our focused areas were SDG1-5 and SDGs SCOUTS FOR SMART SUSTAINABLE CITIES & SDGs SCOUTS FOR FOOD, WATER & ENERGY SECURITY.

We facilitated students and faculty regarding Sustainable Development Goals and had a constructive fruitful discussion on the 2030 Agenda with the principal of the school, ***Sir Anwar Ali.***

We also performed an activity with the students to make them understand the concept of thinking out of the box to achieve the 2030 Agenda.

Overall, it went very well, and students learnt many things including Sustainability and its importance for our present and future generations.

10. VISIT TO TAMEER E WATAN COLLEGE:

Tameer I Watan College (students of 1st year).

Dated: 21st December 2022.

SDGs SCOUTS conducted an Awareness Session, delivered the concept of sustainability and the need to achieve 17 goals before 2030. Multimedia wasn't available so we conducted an interactive discussion session in which students actively participated. They also participated in a Q&A session in the end.

We also had a meeting with the Director Academics of the College. They appreciated and acknowledged our efforts as young change makers. They asked about our projects and supervisor Dr Athar Rashid as well. We explained briefly about them and our objectives as SDGs SCOUTS for Smart Sustainable Cities.

They also provided us with a letter of Acknowledgement and gave us feedback regarding our project campaign.

SKgraphics
21-Dec-2022, 10:09

SKgraphics
21-Dec-2022, 10:44

SKgraphics
21-Dec-2022, 10:31

11. VISIT TO MINISTRY OF PLANNING AND DEVELOPMENT, FEDERAL SDGs UNIT:

We had a quite interactive discussion with the core team of SDGs Unit. It was very beneficial & informative for the whole team. They gave us a lot of inspirational ideas regarding our Sustainable Development & Sustainable cities which we can imply during our project.

They also showed us the new Smart Dashboard for SDGs & how it'll work, which has not launched on the site yet. It will be a major help for the researchers.

We asked them a few questions on which their interviews are based, which will be shared shortly.

They acknowledged our efforts to a great extent and assured us of all kinds of help in future regarding our project. Specifically, they were very impressed with the efforts of our Project supervisor Dr. Athar Rashid that he is focusing on educating and uplifting youth regarding SUSTAINABLE DEVELOPMENT GOALS.

We also invited them at NUML to conduct an Awareness Seminar on 2030 Agenda & vice versa. We'll arrange the seminar under the supervision of Dr. Athar Rashid.

Pakistan SDGs
@PakistanSDGs
#FederalSDGsUnit @PlanComPakistan hosted a group of students from @NUML curious to learn about #SDGs & informed them about status of implementation of SDGs in Pakistan, SDGs Prioritization Framework, National Dashboard, ongoing reporting & alignment of development plans with SDGs
SUSTAINABLE DEVELOPMENT GOALS
Ahsan Iqbal and 7 others
1:53 PM · 22 Dec 22
9 Retweets 27 Likes

SUSTAINABLE DEVELOPMENT GOALS
Federal SDGs Support Unit
Global Indicator Framework for the Sustainable Development Goals and Targets of the Agenda for Sustainable Development
SUSTAINABLE DEVELOPMENT GOALS

12. MEETING WITH DIRECTOR ACADEMICS, HEC:

13. AWARENESS CAMPAIGN IN NATIONAL UNIVERSITY OF MODERN LANGUAGES, ISLAMABAD:

14. MEETING WITH CHAIRPERSON FEDERAL SDGs UNIT:

Team SDG 1-5 visited the Ministry of Planning and Development; Federal SDGs Unit today on January 4th,2023, under the supervision of Dr Athar Rashid. We met with ***Ma'am Rubina Zulqarnain (Head Federal SDGs Unit)*** as well as the whole team. Our project supervisor Dr Athar Rashid (Assistant Professor GPP NUML) introduced SDGs SCOUTS and our projects to them.

It was a fruitful meeting consisting of constructive discussion and sharing of ideas regarding Sustainability in the region.

Agenda of the meeting:

1. What are the aims of federal SDGs Unit, purpose, working and vice versa?

2. Progress until 2022?

3. Did any organizations Collab with SDGs Unit?

4. Events like COVID-19 & Floods have caused major damage to the sustainability of our country, socially, environmentally and economically? How are you seeing it as SDGs Unit? How can we recover the loss?

5. What are we lacking specifically here in Pakistan that is a major hurdle in achieving sustainability? By 2030 will we be able to sustain our resources and condition?

6. Why is it important, the 2030 agenda for Pakistan?

7. Youth Inclusion? Any future projects which will involve youth?

They also gave us the Letter of acknowledgement with special appreciation to our project supervisor Dr Athar Rashid. Letter will be shared in a while.

15. VISIT TO PCRWR, ISLAMABAD:

We discussed our projects; SDGs Scouts for food, water & energy & SDGs Scouts for Smart Sustainable Cities that are in very much coordination with PCRWR.

We met ***Dr Saiqa*** & her efficient team there under the supervision of Dr Athar Rashid. It was a very fruitful meeting, and we got a lot of information, data &

knowledge which will further help us in building each one of our projects through innovative ways.

Areas discussed:

•Managing & Modifying Filtration plants across Islamabad

•Projects collaboration with CDA regarding achieving sustainability

•Water Testing processes & Criteria according to WHO

•Standardized Methods under ISO17025 Act

•Situation of Central Punjab including Kasur, Lahore, Mianwali, and parts of Sindh including Indus River and the presence of Arsenic in water there which is causing cancer

•Exportation of Rice

•Economic Fund Division

•Wastewater, Surface Water bodies, Pharmaceutical, Antibiotics discharge in Rivers

•Public Health Policies

•DO, BOD, COD

•Rainwater Harvesting and recently imposed policies in CDA By-laws (No water discharge outside the house)

•Conservation of Water

•National Water Conservation Strategies, National Water Policy, Drinking Water Policy & Implementation Framework

•Decentralization System

•Action Plan of PCRWR

Inter-related Ministries:

•Ministry of Science & Technology

•Ministry of Transport & Communication

•Ministry of Broadcasting & Information

•Ministry of Religious Affairs

Methods of Rainwater Harvesting:

•Rooftop Rainwater Harvesting with drip irrigation

•Ground Water Recharge through Soak way pit

•First flush through Sand Filter

•Wastewater Filtration & use in agriculture through Sand Filtration

•Water Filtration Plant for Flood Areas/Water

PCRWR also offered us three-week internship for the research and Management Department. We also proposed our idea regarding our project on which they assured us to provide full support. It was a treasure visiting PCRWR and we are very grateful to our project supervisor Dr Athar Rashid for his continuous support, guidance & mentorship.

Wastewater Treatment System of PCRWR
PCRWR
NWQL
Layout of Hybrid Constructed-Wetland Sewage Treatment Plant
Pakistan Council of Research in Water Resources (PCRWR)
SKgraphics
06-Jan-2023, 16:00

Organza Mesh
9″
3″
Chips (1
6″
Crushed Stone (1/2″ - 3/4″)
3′
12″
Gravel (2″-3″)
PVC Mesh
6″
SKgraphics
06-Jan-2023, 15:50
SKgraphics
06-Jan-2023, 15:51

16. VISIT TO KOHISTAN ENCLAVES:

A planned community called Kohistan Enclave located in Wah Cantt uses a variety of smart technology to improve livability, lessen its impact on the environment, and foster economic development.

Kohistan Enclave employs a number of Smart technologies, including:

1. Smart Power Supply System: This technology makes it possible to distribute electricity efficiently, cutting down on both energy waste and prices.

2. Public Transportation Systems (ITS): This technology is utilized to control and optimize the flow of traffic, ease congestion, and enhance safety.

3. Internet of Things (IoT): This technology allows for increased connectivity and control by integrating different systems and gadgets in the city.

4. Smart Waste Management: This technology helps to minimize the environmental impact of waste collection and disposal.

5. Water Management System: This technology optimizes the usage and distribution of water, cutting down on waste and expenses.

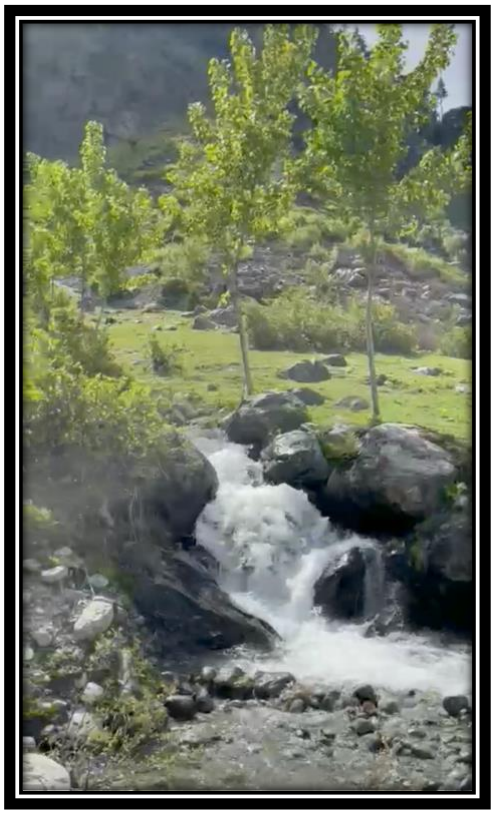
6. New Building Automation: This technology controls and optimizes the use of energy for heating and cooling in buildings, cutting down on energy use and it is also designed for PWDs so they can enjoy smart living.

7. Smart Security: This technology is employed to keep an eye on and protect the city, ensuring the security of both citizens and visitors.

There are additional intelligent technologies that are now in use or that Kohistan Enclave plans to deploy.

17. INTERVIEW WITH SALES HEAD, CANOPY RESORTS KALAM:

They talked about making electricity through water flowing from glaciers at Grid stations.



18. CASE STUDY OF CAPITAL SMART CITY:

Capital Smart City Islamabad is a planned development that incorporates a wide range of smart technologies to enhance livability, reduce environmental impact, and promote economic growth. Some of the smart technologies used in Capital Smart City Islamabad include:

1. Smart Grid: This technology enables the efficient distribution of electricity, reducing energy waste and costs.

2. Intelligent Transportation Systems (ITS): This technology is used to manage and optimize traffic flow, reduce congestion, and improve safety.

3. Internet of Things (IoT): This technology enables the integration of various devices and systems in the city, allowing for greater connectivity and control.

4. Smart Lighting: This technology is used to control and optimize the use of streetlights, reducing energy consumption and costs.

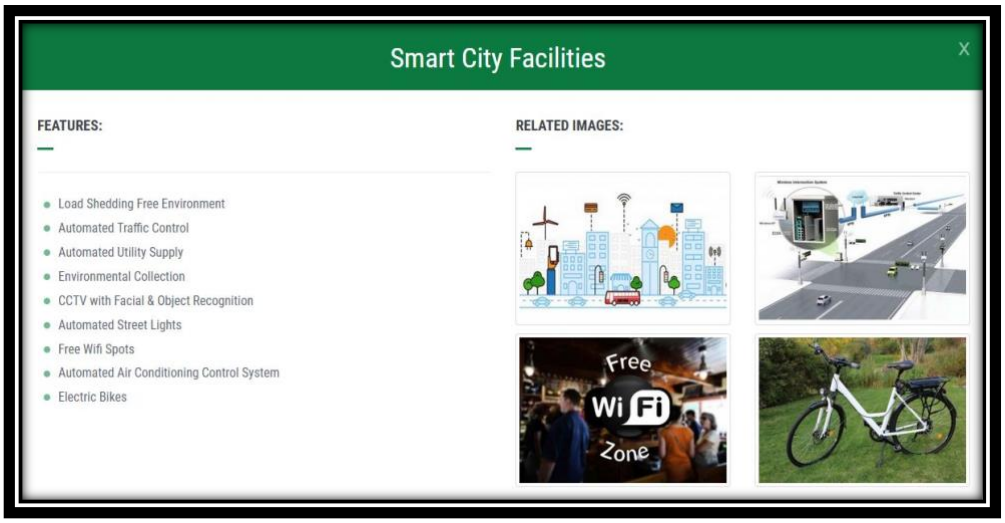
5. Smart Waste Management: This technology is used to optimize waste collection and disposal, reducing environmental impact.

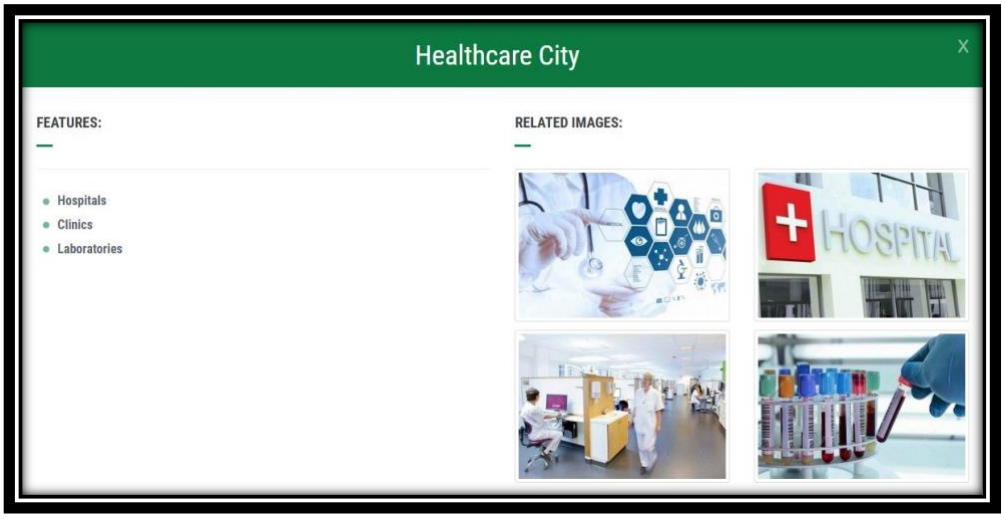
6. Smart Water Management: This technology is used to optimize the use and distribution of water, reducing waste and costs.

7. Smart Building Automation: This technology is used to control and optimize the use of energy, heating and cooling in buildings, reducing energy consumption and costs.

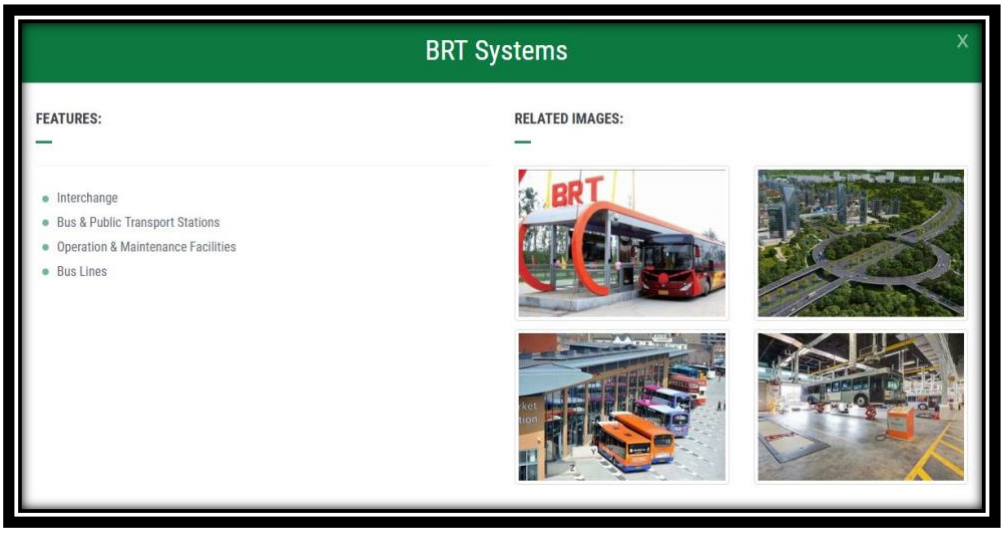
8. Smart Security: This technology is used to monitor and secure the city, ensuring the safety of residents and visitors.

This is not an exhaustive list and other smart technologies that are being used or planned to be used in Capital Smart City Islamabad.



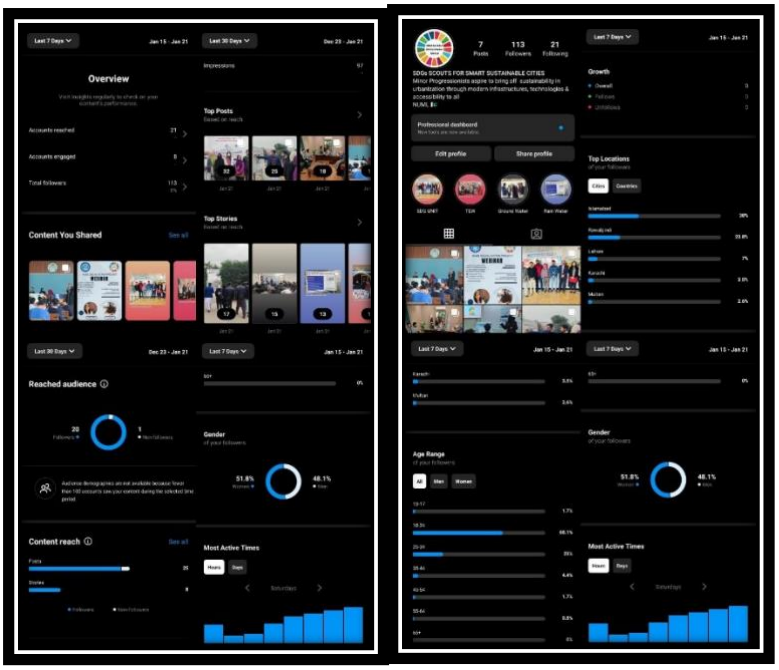


Urban Utilities
X
FEATURES:
Street Food Truck Park
Grid Station
Solar Parks
Potable Water Treatment Plant
Police Station
Sewerage Treatment Plant
Irrigation System
Security Control
Fire Fighting/Civil Defence System
Solid Waste Management System
RELATED IMAGES:


BRT Systems
X
FEATURES:
Interchange
Bus & Public Transport Stations
Operation & Maintenance Facilities
Bus Lines
RELATED IMAGES:
BRT

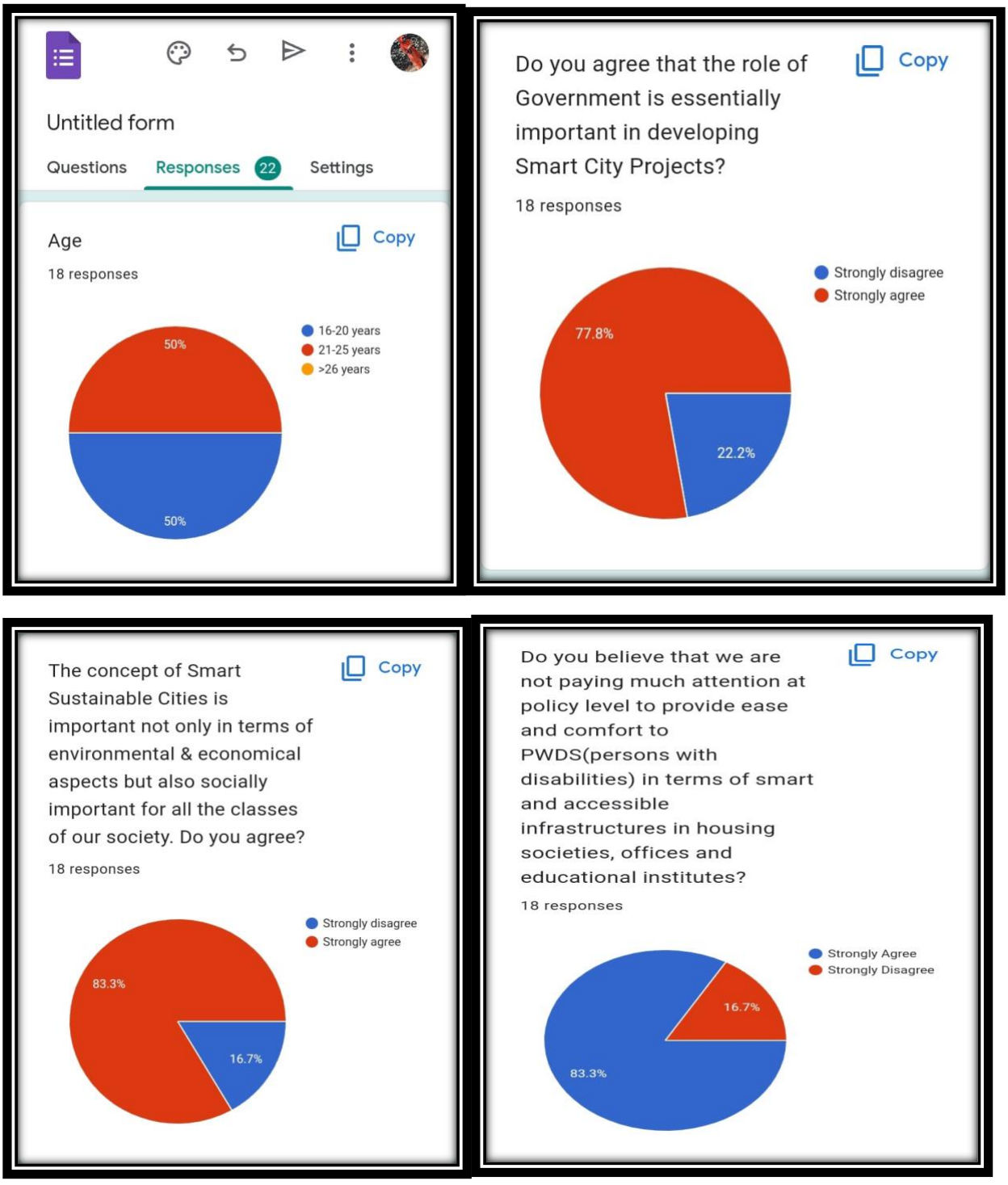
19. SOCIAL MEDIA AWARENESS CAMPAIGN:

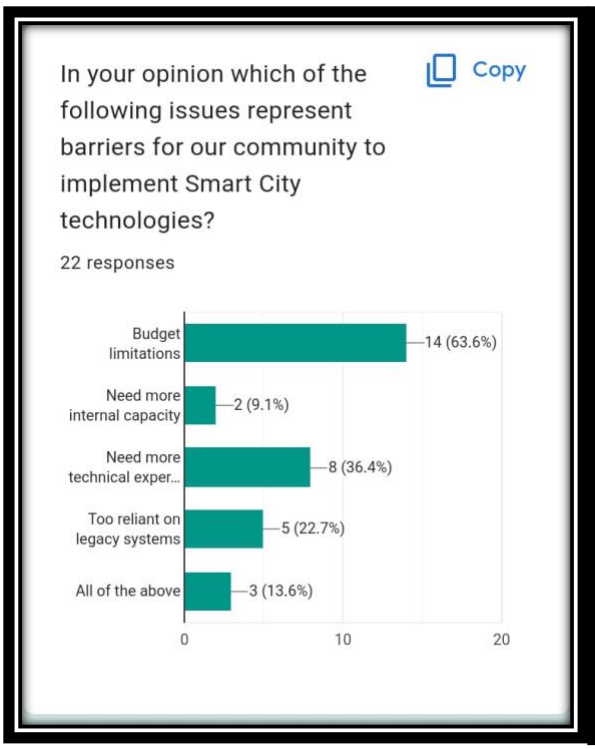
As social media play an important role in increasing public awareness and collecting views, information and attitudes toward certain issues. Also, Media is the most powerful tool of communication in emerging world and increased awareness and present the real stage of society. Team SSC launched a social media public campaign to aware the public regarding the concept of Smart cities. We wanted people to be aware of the importance of building smart cities and how they can contribute towards the initiative of smart cities. We have posted about different activities we have conducted and engaged our social media followers.



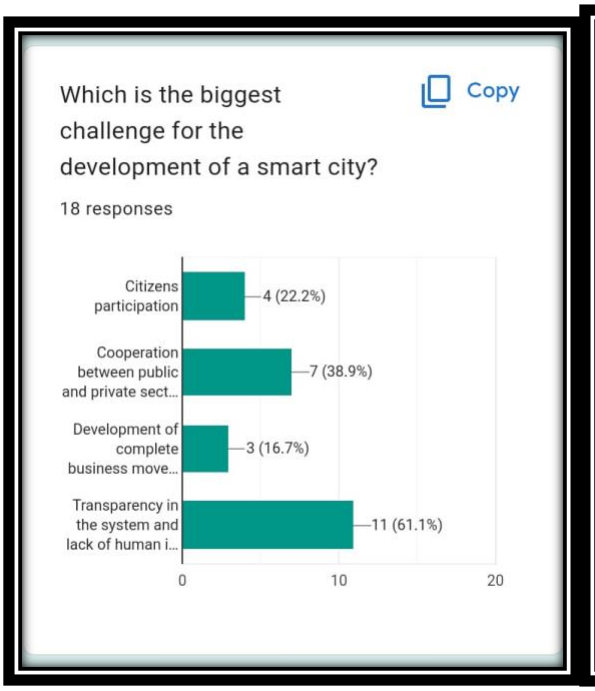
20. GOOGLE SURVEY:

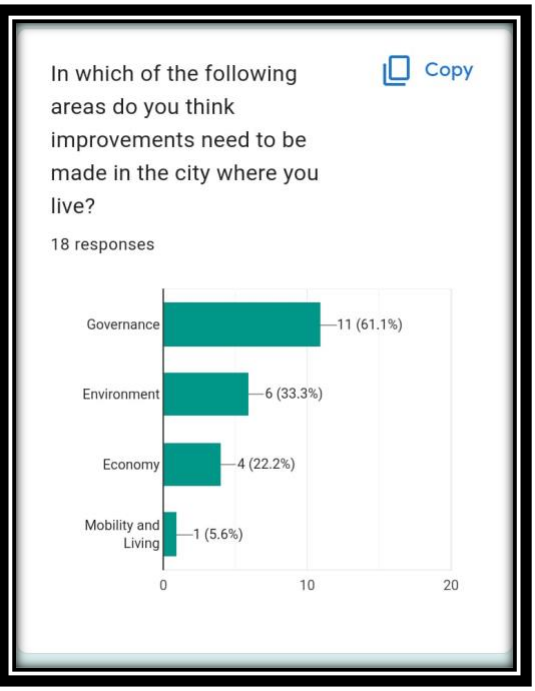
Further we conducted a survey by generating a Google form in order to know more problems caused by plastic bags in daily life in which we asked about people's opinions.




In your opinion which of the following issues represent barriers for our community to implement Smart City technologies?
Copy
22 responses
Budget limitations
14 (63.6%)
Need more internal capacity
2 (9.1%)
Need more technical exper...
8 (36.4%)
Too reliant on legacy systems
5 (22.7%)
All of the above
3 (13.6%)
0
10
20

Which of the following are we lacking the most in achieving Smart Sustainable City Planning in your city?
Copy
18 responses
Adequate water & electric supply
3 (16.7%)
Sanitation & affordable hous...
3 (16.7%)
Digitalization and Good Governan...
4 (22.2%)
Health, Education & Se...
1 (5.6%)
All of the above
13 (72.2%)
0
10
20


Which is the biggest challenge for the development of a smart city?
Copy
18 responses
Citizens participation
4 (22.2%)
Cooperation between public and private sect...
7 (38.9%)
Development of complete business move...
3 (16.7%)
Transparency in the system and lack of human i...
11 (61.1%)
0
10
20


In which of the following areas do you think improvements need to be made in the city where you live?
Copy
18 responses
Governance
11 (61.1%)
Environment
6 (33.3%)
Economy
4 (22.2%)
Mobility and Living
1 (5.6%)
0
10
20

21. OBJECTIVES ACHIEVED:

The main aim was to create awareness, and we have done it through public awareness campaign drive, distribution of brochures, wall poster pasting, and social media campaign.

We have ensured that people became aware of the concept of smart cities through all of these activities.

Fortunately, we got a very positive response from people. We have also motivated them to become digitally literate as it is the most important characteristic of smart cities.

22. OVERALL IMPACT OF THE PROJECT:

Throughout the project we conducted awareness campaigns to educate people overall about increasing Urbanization issues and it was successful. We will take this project further to the national level to stop the pollution and climatic changes as well as achieving sustainability in urbanization. Our faculty and other people praised the project and supported us.

We are much appreciated on our social work by Society, Peers and teachers and also got appreciation letter from many leading organizations in the field.

- People advised to arrange much more for them on such topics.
- On social media accounts people approached us to make them as

member of our team. Our friends from other universities are quite eager

to join us after this semester.

23. SKILLS ENHANCED DURING THE PROJECT:

The most important and final goal of the Social Action Project is to improve our educational and professional career chances. There are numerous skills that add value to us, as described below:

Negotiation and Communication Abilities: During the project, we improved our communication skills by speaking honestly with people and communicating with

high officials. We are more confident in our communication with others now than we were previously.

Time Management: This project has tremendously enhanced our time management. We are now more aware of the need to accomplish more in less time and to better manage our time in order to boost productivity.

Patience: The most valuable ability we have acquired as a result of this endeavor is patience. Throughout the entire Social Action Project's striving path, it had always been a part of us.

Teamwork: In any group task, teamwork may make or break the event. We learned how to work in groups and cooperate.

Critical Thinking and Problem Solving: The most significant ability given to our personality through this initiative is critical thinking and problem solving. Our acts and thinking have become more circumspect. Our practice of making snap decisions has shifted, and deep ideas now predominate in our minds before we make a decision.

From this social action project, we learned a lot of skills and lessons as well.

• This project developed our skills through different social activities and

virtual sessions.

• The most important skill we've learned is how to communicate with

other professionals in a professional way. So, our communication skills

had improved a lot. And also, we learn professionalism.

• We arranged different webinars with different focal personalities in a

short time. Time management was the main thing which we did but also

We faced problems as well.

• We learned a lot about the importance of teamwork as well.

• Our writing skills improved a lot

• This project made us capable to acquire knowledge regarding the issues

happening in society.

• Social action project helped us to learn about the graphic designing, reporting, and speaking to other people as well.

• This project helped us to develop the sense of social responsibilities.

• It also enlightens us about policy making, Lobbying and implementation and evaluation of a design policy.

24. CHALLENGES FACED:

The social action project's stumbling phase brought with it a slew of new problems. Initially some of the institutions didn't respond to us. Whenever we went for a meeting to them they gave us another time for the meeting. Time management was also the main issue because in limited time we had to do a lot of work. Few people responded after we met again and again to them due to which our time was wasted too. Some of the most difficult scenarios are being written down:

1. Time Management: During the project, time management was a big challenge. There was a lot of work to be done in a short amount of time. Conducting online classes on a daily basis was a demanding undertaking that made it tough for us to administer multiple courses at the same time.

2. Repeated Meeting Postponement: The government entities were severely obstructing our initiative by repeatedly postponing meetings.

3. Officials' Discouragement: Some groups were discouraging in terms of demotivating us from our goal and discounting our struggles.

4. Lack of facilitation for students: It was the most challenging thing to face throughout the project. Many organizations, whether public or private, do not facilitate students. And in our capacity, we were unable to follow their rigorous procedures.

25. SUSTAINABILITY PLAN:

25.1 AWARENESS DRIVE IN COLLABORATION WITH CDA:

Capital Development Authority is a public benefit corporation responsible for providing municipal services in Islamabad Capital Territory. The CDA was established on 14 June 1960 by executive order entitled Pakistan Capital Regulation.

We are planning to collaborate with CDA as NUML SDGs SCOUTS FOR SMART SUSTAINABLE CITIES UNDER THE SUPERVISION OF DR. ATHAR RASHID.

25.2 WATER HARVESTING PROPOSAL FOR NUML, ISLAMABAD IN COLLABORATION WITH PCRWR:

Water harvesting is a technique used to collect, store, and distribute rainwater for later use. This method is becoming increasingly popular as a way to conserve water and reduce dependence on municipal water supplies. It is also a sustainable way to manage water resources, especially in areas where water is scarce or where there are water shortages.

There are many different methods of water harvesting, each with its own advantages and disadvantages. Some of the most common methods include:

Roof water harvesting: This method involves collecting rainwater from the roof of a building and storing it in a tank or cistern for later use. This is a simple and effective way to collect water and it can be done with minimal investment.

Surface runoff harvesting: This method involves collecting water from surfaces such as streets, sidewalks, and parking lots. This water is then directed into a catchment area where it can be stored for later use.

Subsurface harvesting: This method involves collecting water from underground sources such as aquifers. This water can be used for irrigation, drinking, and other purposes.

Rainwater harvesting in agriculture: This method involves collection and storage of rainwater in a farm or agriculture land, later it can be used for irrigation.

Water harvesting systems can be used for a variety of purposes including irrigation, drinking, and sanitation. They can also be used to recharge groundwater and to provide water for livestock.

- One of the main advantages of water harvesting is that it can help to reduce the demand for municipal water supplies. This can help to reduce water bills and also help to conserve water resources. Water harvesting can also help to reduce the risk of flooding in areas where there is heavy rainfall.
- Another advantage of water harvesting is that it can improve the quality of water. Rainwater is naturally pure and does not contain any of the chemicals or pollutants that are often found in municipal water supplies.
- It's also a cost-effective solution for places where water is scarce. It requires minimal investment, and the maintenance cost is also low.

In conclusion, water harvesting is a sustainable and cost-effective way to manage water resources. It can help to conserve water and reduce dependence on municipal water supplies. It also offers many benefits such as reducing the risk of flooding, improving the quality of water, and providing a reliable source of water in areas where water is scarce. It's a small step that can make a big difference in conserving water resources.

25.2.1 PROPOSAL DRAFT FOR NUML ADMINISTRATION:

Subject: Proposal for Implementing Water Harvesting at NUML ISLAMABAD.

Respeced University Administration,

I am writing to propose the implementation of water harvesting techniques at NUML ISLAMABAD. With increasing concerns about water scarcity and the need for sustainable water management, it is important that our university takes proactive measures to conserve and utilize water resources in an efficient manner.

Water harvesting is the process of collecting, storing, and utilizing rainwater that would otherwise go to waste. This method can be used for various purposes such as irrigation, landscaping, flushing toilets, and even drinking water. Not only does

it help to conserve water, but it also reduces the strain on municipal water supply systems and can lead to cost savings for the university.

I propose that we implement water harvesting systems in several key areas of the university including the main campus, student housing, and athletic fields. This can be achieved through a combination of techniques such as rainwater harvesting tanks, rooftop harvesting systems, and permeable pavements.

Additionally, I suggest that we include educational and awareness-raising components to the project, such as informational signage and workshops for students, staff, and faculty. This will help to promote the importance of water conservation and sustainable water management practices on campus and in the wider community.

I believe that the implementation of water harvesting at NUML ISLAMABAD will not only help to conserve valuable water resources but also serve as a model for other universities and organizations to follow. I would be happy to discuss this proposal further and provide more detailed information about potential costs and benefits.

Thank you for your consideration.

Sincerely,

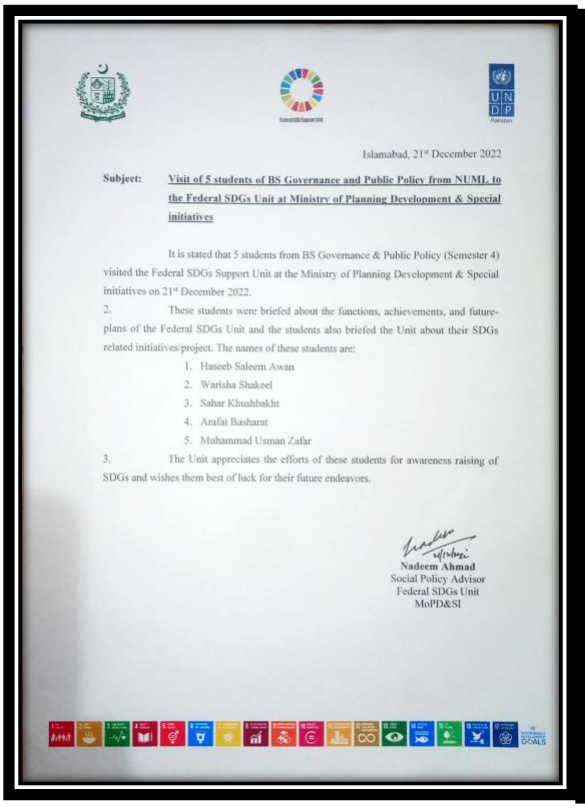
25.3 OTHER PLANS OF SUSTAINABILITY FOR THE PROJECT:

- Internship at Federal SDGs Unit, Ministry of planning and development, Islamabad.
- Internship at PCRWR, Research and Management departments.

26. FINANCE SHEET:

Serial number	Date	Activity details	Cost (Rs)
1.	Dec 15'2022	Visit to SKANS school of Accountancy	500
2.	Dec 16'2022	Visit to IMCB, I-8/3	400
3.	Dec 20'2022	Visit to IMSB, F-6/2	680
4.	Dec 21'2022	Visit to Tameer e Watan college	700
5.	Dec 24'2022	Visit to Federal SDGs Unit, Ministry of Planning and Development	800
6.	Dec 27'2022	Visit to HEC, Meeting with Director Academics HEC	240
7.	January 04'2023	Meeting with Chairperson Federal SDGs Unit	800
8.	January 06' 2023	Visit to PCRWR, Islamabad	390
11.	January 07' 2023	Visit to Kohistan Enclaves	400
12.	January 20' 2023	Visit to Canopy Resorts Kalam, Head Office, Blue Area, Islamabad	400
13.	Dec 15' 2022- Jan 20' 2023	Other, stationary & printing cost	1500
		TOTAL	6,810

27. ACKNOWLEDGEMENT LETTERS:



Islamabad, 21st December 2022

Subject: **Visit of 5 students of BS Governance and Public Policy from NUML to the Federal SDGs Unit at Ministry of Planning Development & Special initiatives**

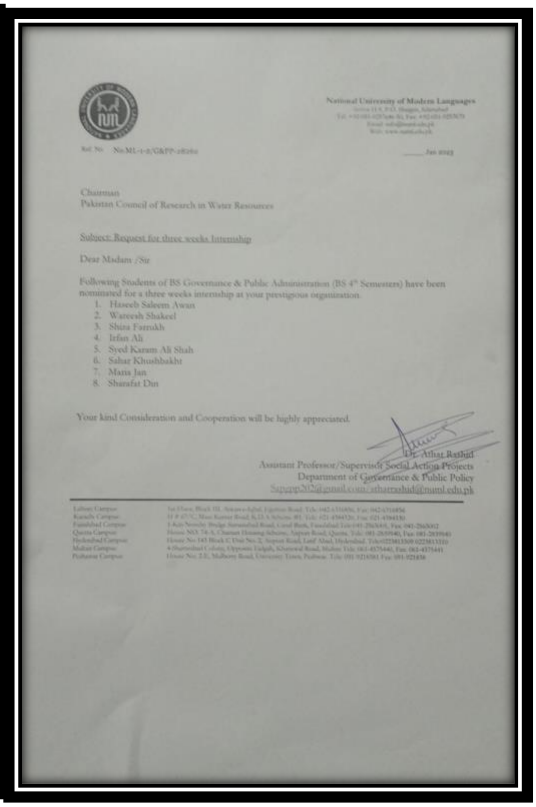
It is stated that 5 students from BS Governance & Public Policy (Semester 4) visited the Federal SDGs Support Unit at the Ministry of Planning Development & Special initiatives on 21st December 2022.

2. These students were briefed about the functions, achievements, and future-plans of the Federal SDGs Unit and the students also briefed the Unit about their SDGs related initiatives/project. The names of these students are:

1. Haseeb Saleem Awan
2. Warisha Shakeel
3. Sahar Khushbakht
4. Arafat Basharat
5. Muhammad Usman Zafar

3. The Unit appreciates the efforts of these students for awareness raising of SDGs and wishes them best of luck for their future endeavors.

Nadeem Ahmad
Social Policy Advisor
Federal SDGs Unit
MoPD&SI



National University of Modern Languages

Chairman
Pakistan Council of Research in Water Resources

Subject: Request for three weeks Internship

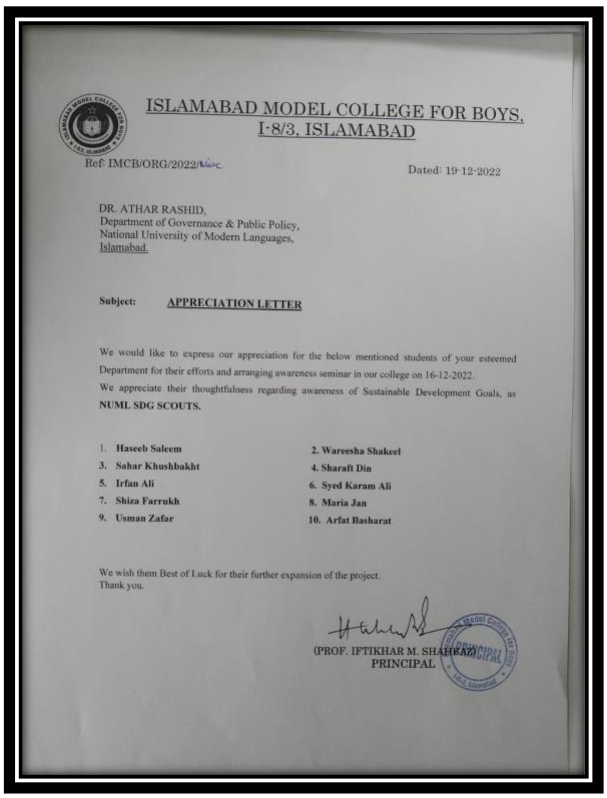
Dear Madam /Sir

Following Students of BS Governance & Public Administration (BS 4th Semesters) have been nominated for a three weeks internship at your prestigious organization.

1. Haseeb Saleem Awan
2. Wareesh Shakeel
3. Shiza Farrukh
4. Irfan Ali
5. Syed Kazam Ali Shah
6. Sahar Khushbakht
7. Maria Jan
8. Sharafat Din

Your kind Consideration and Cooperation will be highly appreciated.

Dr. Athar Rashid
Assistant Professor/Supervisor Social Action Projects
Department of Governance & Public Policy



ISLAMABAD MODEL COLLEGE FOR BOYS,
I-8/3, ISLAMABAD

Ref: IMCB/ORG/2022/Misc Dated: 19-12-2022

DR. ATHAR RASHID,
Department of Governance & Public Policy,
National University of Modern Languages,
Islamabad.

Subject: APPRECIATION LETTER

We would like to express our appreciation for the below mentioned students of your esteemed Department for their efforts and arranging awareness seminar in our college on 16-12-2022. We appreciate their thoughtfulness regarding awareness of Sustainable Development Goals, as **NUML SDG SCOUTS.**

1. **Haseeb Saleem**
2. **Wareesha Shakeel**
3. **Sahar Khushbakht**
4. **Sharaft Din**
5. **Irfan Ali**
6. **Syed Karam Ali**
7. **Shiza Farrukh**
8. **Maria Jan**
9. **Usman Zafar**
10. **Arfat Basharat**

We wish them Best of Luck for their further expansion of the project.
Thank you.

(PROF. IFTIKHAR M. SHAHBAZ)
PRINCIPAL

SKANS
School of Accountancy

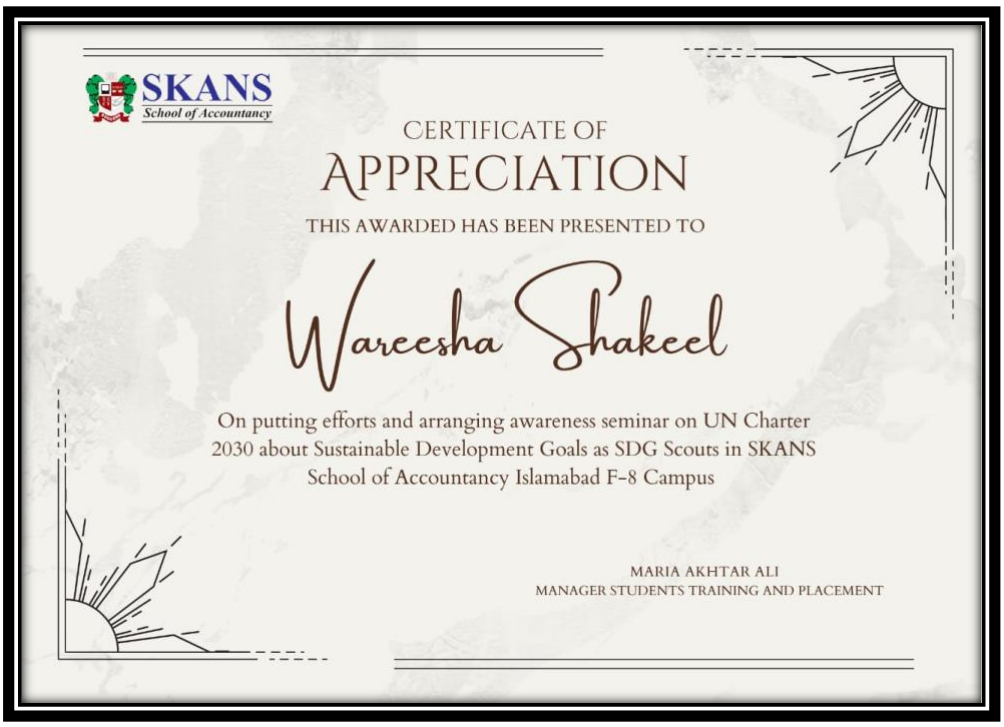
CERTIFICATE OF
APPRECIATION

THIS AWARDED HAS BEEN PRESENTED TO

Sahar Khushbakht

On putting efforts and arranging awareness seminar on UN Charter 2030 about Sustainable Development Goals as SDG Scouts in SKANS School of Accountancy Islamabad F-8 Campus

MARIA AKHTAR ALI
MANAGER STUDENTS TRAINING AND PLACEMENT



SKANS
School of Accountancy

CERTIFICATE OF
APPRECIATION

THIS AWARDED HAS BEEN PRESENTED TO

Wareesha Shakeel

On putting efforts and arranging awareness seminar on UN Charter 2030 about Sustainable Development Goals as SDG Scouts in SKANS School of Accountancy Islamabad F-8 Campus

MARIA AKHTAR ALI
MANAGER STUDENTS TRAINING AND PLACEMENT

SKANS
School of Accountancy

CERTIFICATE OF
APPRECIATION

THIS AWARDED HAS BEEN PRESENTED TO

Sharafat Din

On putting efforts and arranging awareness seminar on UN Charter 2030 about Sustainable Development Goals as SDG Scouts in SKANS School of Accountancy Islamabad F-8 Campus

MARIA AKHTAR ALI
MANAGER STUDENTS TRAINING AND PLACEMENT

SKANS
School of Accountancy

CERTIFICATE OF
APPRECIATION

THIS AWARDED HAS BEEN PRESENTED TO

Haseeb Saleem

On putting efforts and arranging awareness seminar on UN Charter 2030 about Sustainable Development Goals as SDG Scouts in SKANS School of Accountancy Islamabad F-8 Campus

MARIA AKHTAR ALI
MANAGER STUDENTS TRAINING AND PLACEMENT

SKANS
School of Accountancy

CERTIFICATE OF
APPRECIATION

THIS AWARDED HAS BEEN PRESENTED TO

Usman Zafar

On putting efforts and arranging awareness seminar on UN Charter 2030 about Sustainable Development Goals as SDG Scouts in SKANS School of Accountancy Islamabad F-8 Campus

MARIA AKHTAR ALI
MANAGER STUDENTS TRAINING AND PLACEMENT

28. CONCLUSION:

It is concluded from our research and experience during the project that the concept of Smart Cities if very for Pakistan. Most of the people are not aware of it. In times when the problem of urbanization is increasing day by day and it is becoming difficult for the government to provide service delivery to its citizens. Solution of this problem lies in the concept of building Smart Cities.

The use of technology in cities will make their systems efficient. Therefore, Pakistan needs to make major changes in urban planning. Both technological and behavioral changes are required.

People's minds must be changed (they must become smart), and they must be made aware of the benefits of smart cities. Technology, on the other hand, involves a thorough and rigid housing policy, as well as the utilization of novel ideas and technology, as well as making them environmentally friendly. It is necessary to employ technology in this age of development. It saves resources, is inexpensive to all, and meets international standards by utilizing technology.

THANK YOU!