2025 ജനുവരി

Atal Mission for Rejuvenation and Urban Transformation

ലക്കം 11

അമൃത്

വാർത്താ പത്രിക

ആലപ്പുഴ നഗരസഭയിൽ ഹൗസ് ബോട്ടുകളിൽ നിന്ന് ദ്രവ മാലിന്യം മൊബൈൽ സെപ്റ്റേജ് യൂണിറ്റുകൾ ഉപയോഗിച്ച് സംസ്കരണം നടത്തുന്നതിന്റെ ഉദ്ഘാടനം ബഹു. എം.എൽ.എ. ശ്രീ. ചിത്തരഞ്ജൻ നിർവ്വഹിക്കുന്നു.

തൃശ്ശൂരിൽ സംഘടിപ്പിച്ച ജലം ജീവിതം പരിപാടി

കൊട്ടാരക്കരയിൽ സംഘടിപ്പിച്ച ജലം ജീവിതം പരിപാടി

അമൃത് വാർത്താ പത്രിക

ജനുവരി 2025 | പുസ്തകം 3 | ലക്കം 11

എഡിറ്റോറിയൽ

അമൃത് ഒന്നാം ഘട്ട പദ്ധതികൾ സംസ്ഥാനത്ത് വളരെ കാര്യക്ഷമമായി പൂർത്തിയാക്കുവാൻ നമുക്ക് സാധിച്ചു. അമൃത് 1.0 യിൽ സംസ്ഥാനത്തെ തെരെഞ്ഞെടുത്ത 9 നഗര സഭകളിൽ മാത്രമാണ് നടപ്പാക്കിയിരുന്നത്. അമൃത് 2.0 സംസ്ഥാനത്തെ മുഴുവൻ നഗരസഭകളിലുമായാണ് നടപ്പിൽ വരുത്തുന്നത്. ശുദ്ധ ജല വിതരണം, ജലസ്രോതസ്സുകളുടെ സംരക്ഷണം, ജലത്തിന്റെ പുനരുപയോഗം, ദ്രവമാലിന്യ സംസ്കരണം എന്നിവയിൽ അധിഷ്ഠിതമായ പദ്ധതികളാണ് പ്രധാനമായും അമൃത് 2.0 യിൽ ഉൾപ്പെടുത്തിയിരിക്കുന്നത്. അമൃത് ഒന്നാം ഘട്ടത്തിൽ നിന്ന് വ്യത്യസ്തമായി പദ്ധതി പൂർത്തീകരിണത്തിന്റെ വിവിധ ഘട്ടങ്ങൾ വിലയിരുത്തിയാണ് കേന്ദ്ര സഹായം ലഭ്യമാകുന്നത്. അതിനാൽ തന്നെ സമയബന്ധിതമായി പദ്ധതി പ്രവർത്തനങ്ങൾ പൂർത്തീകരിച്ചാൽ മാത്രമെ ഗഡുക്കളായി ലഭിക്കുന്ന കേന്ദ്ര സഹായം പൂർണ്ണമായും നേടിയെടുക്കാൻ സാധിക്കുകയുള്ളൂ. അമൃത് ഒന്നാം ഘട്ട പദ്ധതികൾക്കായി സംസ്ഥാനത്ത് തിരഞ്ഞെടുക്കപ്പെട്ട 6 കോർപ്പറേഷനുകളിലും പാലക്കാട്, ഗുരുവായൂർ, ആലപ്പുഴ എന്നീ 3 മുനിസിപ്പാലിറ്റികളിലും വലിയ തോതിലുള്ള വികസന പ്രവർത്തനങ്ങൾ നടത്തുവാൻ പദ്ധതിയിലൂടെ സാധിച്ചു.

അമൃത് 2.0 പദ്ധതിയിലെ ഉപ പദ്ധതിയായ "ജി.ഐ.എസ്. അധിഷ്ഠിത മാസ്റ്റർ പ്ലാൻ രൂപീകരണം" എന്ന പദ്ധതിയ്ക്കായി സംസ്ഥാനത്ത് നിന്ന് 49 നഗരസഭകളെ ഉൾപ്പെടുത്തിയിട്ടുണ്ട്. ഇതിനാവശ്യമായ പരിശീലന, ബോധവത്ക്കരണ ക്ലാസ്സുകൾ ആരംഭിച്ചു കഴിഞ്ഞു. അമൃത് മിഷൻ നഗരാസൂത്രണ വകുപ്പ് മുഖാന്തിരമാണ് പദ്ധതി നടപ്പിലാക്കുന്നത്. ആദ്യ ഘട്ടമായി തൃശ്ശൂർ കിലയിൽ വച്ച് നടത്തിയ പരിശീലന പരിപാടിയിൽ വിവിധ തദ്ദേശ നഗര സ്ഥാപനങ്ങളിലെ ജനപ്രതിനിധികളും, ഉദ്യോഗസ്ഥരും പങ്കെടുത്തു.

അമൃത് 2.0 പദ്ധതിയുടെ ഭാഗമായി നടത്തുന്ന വിവര വിദ്യാഭ്യാസ വിനിമയ പരിപാടിയായ 'ജലം ജീവിതം' രണ്ടാം ഘട്ടം ആരംഭിച്ചു. സംസ്ഥാനത്തെ സ്കൂൾ വിദ്യാർത്ഥികളിൽ ജല സംരക്ഷണത്തെ കുറിച്ച് അവബോധം ഉണ്ടാക്കുന്നതിനായി ആരംഭിച്ചിട്ടുള്ള പരിപാടിക്ക് മികച്ച പ്രതികരണമാണ് വിദ്യാർത്ഥികളിൽ നിന്ന് ലഭിച്ചുകൊണ്ടിരിക്കുന്നത്. ഇതിലൂടെ പുതിയ ഒരു ജല ഉപഭോഗ സംസ്കാരം നമുക്ക് രൂപപ്പെടുത്തിയെടുക്കാൻ സാധിക്കുമെന്ന് പ്രതീക്ഷിക്കുന്നു. അമൃത് പദ്ധതിയുടെ ഭാഗമായിരിക്കുന്ന ഏവർക്കും സന്തോഷവും ഐശ്വര്യവും നിറഞ്ഞ പുതുവർഷം ആശംസിക്കുന്നു.

മിഷൻ ഡയറക്ടർ

തദ്ദേശസ്വയംഭരണ വകുപ്പ്
കേരള സർക്കാർ

ചീഫ് എഡിറ്റർ
സൂരജ് ഷാജി ഐ.എ.എസ്സ്
മിഷൻ ഡയറക്ടർ

എഡിറ്റർ
മുരളി കൊച്ചുകൃഷ്ണൻ
എൻവിയോൺമെന്റ് എക്പർട്ട് കം
ഹൈഡ്രോ ജിയോളജിസ്റ്റ്

അസിസ്റ്റന്റ് എഡിറ്റർ
സാവിയോ സജി ഇ.ആർ.

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(സ്വകാര്യ വിതരണത്തിന് മാത്രം)

അമൃത് 2.0 പദ്ധതിയിൽ ഉൾപ്പെടുത്തി ഏലൂർ നഗരസഭയിൽ നവീകരിച്ച പാട്ടുപുരയ്ക്കൽ കുളം ബഹു. വ്യവസായ വകുപ്പ് മന്ത്രി ശ്രീ. പി. രാജീവ് ഉദ്ഘാടനം ചെയ്തു

അമൃത് വാർത്താ പത്രിക

ജനുവരി 2025

ഉള്ളടക്കം

5 കേന്ദ്ര ഊർജ്ജ നഗരകാര്യ വകുപ്പ് മന്ത്രി ശ്രീ. മനോഹർ ലാൽ ഖട്ടർ കേരളം സന്ദർശിച്ചു

7 ശബരിമലയിലെ ദ്രവമാലിന്യ സംസ്കരണത്തിനായുള്ള മൊബൈൽ പ്ലാന്റുകളുടെ ഫ്ളാഗ് ഓഫ്

8 തമണ്ടിക്കുളം ഉദ്ഘാടനം

9 തൃശ്ശൂരിലെ മൾട്ടിലെവൽ കാർ പാർക്കിംഗ് സംവിധാനത്തിന്റെ ഉദ്ഘാടനം

10 National Level Training Cum Exposure Visit

12 "ക്ലാസ്സ് II നഗരങ്ങളിൽ ജി.ഐ.എസ്. അധിഷ്ഠിത മാസ്റ്റർ പ്ലാൻ രൂപീകരണം" പ്രഥമ ദേശീയ സംഗമം

13 ജി.ഐ.എസ്. അധിഷ്ഠിത മാസ്റ്റർ പ്ലാൻ രൂപീകരണം — പരിശീലന പരിപാടി

14 Establishing Standards and Essentials for Conventional, Automatic Weather Station (AWS), Automatic Rain Gauge station (ARS) and IoT based Weather Forecasting Technologies and its Utilities.

അമൃത് 2.0 പദ്ധതിയിൽ ഉൾപ്പെടുത്തി നവീകരിച്ച അങ്കമാലി നഗരസഭയിലെ ഐക്കാട്ടുകടവ് കുളം

കേന്ദ്ര ഊർജ്ജ നഗരകാര്യ വകുപ്പ് മന്ത്രി ശ്രീ. മനോഹർ ലാൽ ഖട്ടർ കേരളം സന്ദർശിച്ചു

സംസ്ഥാനത്തെ വിവിധ കേന്ദ്രാവിഷ്കൃത പദ്ധതികളുടെ പുരോഗതി വിലയിരുത്താനായി കേന്ദ്ര ഊർജ്ജ നഗരകാര്യ വകുപ്പ് മന്ത്രി ശ്രീ. മനോഹർ ലാൽ ഖട്ടർ കേരളം സന്ദർശിച്ചു. ബഹു. കേരള മുഖ്യമന്ത്രി ശ്രീ. പിണറായി വിജയനുമായി കേന്ദ്ര മന്ത്രി ചർച്ച നടത്തി. നഗര കാര്യ മന്ത്രാലയം വഴി കേരളത്തിൽ നടപ്പിലാക്കുന്ന വിവിധ പദ്ധതികളുടെ പുരോഗതി സംബന്ധിച്ച് ഉന്നത ഉദ്യോഗസ്ഥരുമായി ബഹു. മന്ത്രി ചർച്ച നടത്തി. നഗര വികസനത്തിനായുള്ള കേരളത്തിന്റെ പദ്ധതികൾക്ക് അദ്ദേഹം പിന്തുണ അറിയിച്ചു.

അമൃത്, സ്മാർട്ട്സിറ്റി പദ്ധതികളുടെ നിർവ്വഹണ പുരോഗതി വിലയിരുത്തിയ കേന്ദ്ര മന്ത്രി പദ്ധതി പുരോഗതിയിൽ തൃപ്തി രേഖപ്പെടുത്തി. തദ്ദേശ സ്വയംഭരണ വകുപ്പ് പ്രിൻസിപ്പൽ സെക്രട്ടറി ഡോ. ഷർമിള മേരി ജോസഫ് ഐ.എ.എസ്., അമൃത് മിഷൻ ഡയറക്ടർ ശ്രീ. സൂരജ് ഷാജി ഐ.എ.എസ്. തുടങ്ങിയ ഉന്നത ഉദ്യോഗസ്ഥർ ബഹു. കേന്ദ്ര മന്ത്രിയുമായി ചർച്ച നടത്തി. നഗര വികസനവുമായി ബന്ധപ്പെട്ട ആവശ്യങ്ങളും പുരോഗതി റിപ്പോർട്ടും ഉദ്യോഗസ്ഥർ ബഹു. മന്ത്രിക്ക് നൽകി. വിവിധ പദ്ധതി പ്രദേശങ്ങളും ബഹു. കേന്ദ്ര മന്ത്രി സന്ദർശിച്ചു.

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ശബരിമലയിലെ മാലിന്യ സംസ്കരണത്തിനായുള്ള മൊബൈൽ ട്രീറ്റ്മെന്റ് പ്ലാന്റുകളുടെ ഫ്ളാഗ് ഓഫ് ബഹു. തദ്ദേശ സ്വയംഭരണ വകുപ്പ് മന്ത്രി ശ്രീ.എം.ബി രാജേഷ് നിർവ്വഹിച്ചു

ലക്ഷകണക്കിന് തീർത്ഥാടകർ എത്തിച്ചേരുന്ന ശബരിമലയിൽ ശാസ്ത്രീയമായ മാലിന്യ സംസ്കരണ സംവിധാനം ശക്തമാക്കുന്നതിന്റെ ഭാഗമായി അമൃത് മിഷന്റെ ഭാഗമായി വാഷ് ഇൻസ്റ്റിറ്റ്യൂട്ടിന്റെയും ഇന്ത്യൻ ബാങ്കിന്റെയും സഹകരണത്തോടെ രണ്ട് മൊബൈൽ ട്രീറ്റ്മെന്റ് പ്ലാന്റുകൾ സജ്ജമാക്കി. ഈ പ്ലാന്റുകളുടെ ഫ്ളാഗ് ഓഫ് തിരുവനന്തപുരത്ത് വച്ച് നടന്ന ചടങ്ങിൽ ബഹു. തദ്ദേശ സ്വയംഭരണ വകുപ്പ് മന്ത്രി ശ്രീ. എം.ബി. രാജേഷ് നിർവ്വഹിച്ചു. ശുചിമുറി മാലിന്യ സംസ്കരണം ശാസ്ത്രീയമായി നടത്തുന്നതിന് ഈ പ്ലാന്റുകൾ ഉപകരിക്കും.

വാഷ് ഇൻസ്റ്റിറ്റ്യൂട്ടിന്റെ ഉടമസ്ഥതയിലുള്ളതാണ് ഈ പ്ലാന്റുകൾ. അമൃത് മിഷന്റെ ഭാഗമായാണ് പ്ലാന്റുകൾ ശബരിമലയിലെത്തിക്കുന്നത്. ആദ്യ ഘട്ടമായി രണ്ട് പ്ലാന്റുകളാണ് എത്തിച്ചുട്ടുള്ളത്. ശേഷിക്കുന്ന രണ്ട് പ്ലാന്റുകൾ കൂടി എത്തുന്നതോടെ പമ്പ, നിലയ്ക്കൽ, എരുമേലി തുടങ്ങിയ ശബരിമല തീർത്ഥാടനത്തിന്റെ പ്രധാന കേന്ദ്രങ്ങളിൽ ട്രീറ്റ്മെന്റ് യൂണിറ്റുകൾ പ്രവർത്തനം തുടങ്ങും. 6000 ലിറ്റർ മാലിന്യം ഒരേ സമയം ശാസ്ത്രീയമായി സംസ്കരിക്കാൻ ശേഷിയുള്ള യൂണിറ്റുകളാണ് ഈ മൊബൈൽ പ്ലാന്റുകളിൽ സജ്ജീകരിച്ചിരിക്കുന്നത്. ശബരിമലയിലെ മണ്ഡലകാല തീർത്ഥാടനം പൂർത്തിയാകുന്നതുവരെ പ്ലാന്റുകളുടെ പ്രവർത്തനം ശബരിമലയിൽ ഉണ്ടാകും.

നിലവിൽ ശബരിമല നേരിടുന്ന ജലമലിനീകരണം മറികടക്കാൻ പമ്പയിൽ 3.5 എം.എൽ.ഡി. പ്ലന്റ് നിലവിലുണ്ട്. നിലയ്ക്കൽ 2 ലക്ഷം ലിറ്ററോളം മാലിന്യം ശേഖരിക്കാനുള്ള സൗകര്യവും എസ്.റ്റി.പി. നിർമാണവും പുരോഗമിക്കുന്നു. സന്നിധാനത്ത് 5 എം.എൽ.ഡി. ട്രീറ്റ്മെന്റ് പ്ലാന്റും, എരുമേലിയിൽ 24 മണിക്കൂർ പ്രവർത്തിക്കുന്ന മൊബൈൽ സെപ്റ്റേജ് ട്രീറ്റ്മെന്റ് പ്ലാന്റും സജ്ജമാണ്. ഇതുവരെ 1,11,710 ലിറ്റർ മാലിന്യം ശാസ്ത്രീയമായി സംസ്കരിച്ചു. അതുപോലെ 2288 ശൗച്യാലയങ്ങളും 103 ബയോ ടോയ്‌ലെറ്റുകളും 130 ബയോ യൂറിനലുകളും തീർത്ഥാടകരുടെ സേവനത്തിനായി ഒരുക്കിയിട്ടുണ്ട്. മാലിന്യ സംസ്കരണ പ്രവർത്തനങ്ങൾ നിരീക്ഷിക്കുന്നതിനായി സംസ്ഥാനത്ത് ആദ്യമായി കൺട്രോൾ റൂം സ്ഥാപിക്കുകയും ചെയ്തു. യോഗത്തിൽ അമൃത് മിഷൻ ഡയറക്ടർ സൂരജ് ഷാജി ഐ.എ.എസ്., വാഷ് ഇൻസ്റ്റിറ്റ്യൂട്ട് പ്രതിനിധി ഷിബിൽ എ., ഇന്ത്യൻ ബാങ്ക് അസിസ്റ്റന്റ് ജനറൽ മാനേജർ സജീവ് കുമാർ സി., പ്രിൻസിപ്പൽ ഡയറക്ടറേറ്റ് ജോയിന്റ് ഡയറക്ടർ എം. മുഹമ്മദ് ഹുവൈസ് എന്നിവർ പങ്കെടുത്തു.

അമൃത് 2.0 പദ്ധതിയിൽ ഉൾപ്പെടുത്തി നവീകരിച്ച തമ്മണ്ടിക്കുളം ബഹു. തദ്ദേശ സ്വയംഭരണ വകുപ്പ് മന്ത്രി ഉദ്ഘാടനം ചെയ്തു

തൃശ്ശൂരിൽ മൾട്ടിലെവൽ കാർ പാർക്കിംഗ് സംവിധാനത്തിന്റെ ഉദ്ഘാടനം ബഹു. തദ്ദേശ സ്വയംഭരണ വകുപ്പ് മന്ത്രി ശ്രീ. എം.ബി രാജേഷ് നിർവ്വഹിച്ചു

തൃശ്ശൂർ കോർപ്പറേഷനിൽ അമൃത് പദ്ധതിയിലെ അർബൻ ട്രാൻസ്പോർട്ട് സെക്ടറിൽ ഉൾപ്പെടുത്തി നിർമാണം പൂർത്തീകരിച്ച മൾട്ടിലെവൽ കാർ പാർക്കിംഗ് സംവിധാനത്തിന്റെ ഉദ്ഘാടനം ബഹു. തദ്ദേശ സ്വയംഭരണ വകുപ്പ് മന്ത്രി ശ്രീ. എം.ബി രാജേഷ് നിർവ്വഹിച്ചു. തൃശ്ശൂർ കോർപ്പറേഷൻ മേയർ ശ്രീ. എം.കെ. വർഗ്ഗീസ് ചടങ്ങിൽ അദ്ധ്യക്ഷനായിരുന്നു. കോർപ്പറേഷൻ ഡെപ്യൂട്ടി മേയർ, സ്റ്റാൻഡിംഗ് കമ്മിറ്റി ചെയർമാൻമാർ, കൗൺസിലർമാർ, ഉദ്യോഗസ്ഥർ തുടങ്ങിയവർ ചടങ്ങിൽ പങ്കെടുത്തു.

തൃശ്ശൂർ കോർപ്പറേഷനിൽ വിവിധ ആവശ്യങ്ങൾക്കായി പ്രതിദിനം നിരവധി ആൾക്കാർ എത്തുന്നുണ്ട്. ഇതിൽ ഭൂരിഭാഗം പേരും സ്വകാര്യ വാഹനങ്ങൾ ഉപയോഗപ്പെടുത്തുന്നവരാണ്. കോർപ്പറേഷനിൽ എത്തുന്ന വാഹനങ്ങൾ പാർക്ക് ചെയ്യുന്നതിനുള്ള സ്ഥലം പരിമിതമാണ്. ഈ പ്രശ്നം പരിഹരിക്കുന്നതിലേയ്ക്കാണ് അമൃത് പദ്ധതിയിൽ ഉൾപ്പെടുത്തി 88 ലക്ഷം രൂപ ചെലവിൽ ആധുനിക രീതിയിലുള്ള ആട്ടോമേറ്റഡ് മൾട്ടി ലെവൽ കാർ പാർക്കിംഗ് സംവിധാനം നിർമ്മിച്ചത്. മൂന്ന് വാഹനങ്ങൾ പാർക്ക് ചെയ്യാൻ സാധിക്കുന്ന സ്ഥലത്ത് 11 കാറുകൾ പാർക്ക് ചെയ്യാൻ കഴിയും എന്നതാണ് ഈ സംവിധാനത്തിന്റെ സവിശേഷത.

National Level Training Cum Exposure Visit

The Government of India has identified urbanization as a key priority area to meet growth targets for the Twelfth Five Year Plan. Urban areas are basically growth centers, that attract investments from different sectors and offer vast livelihood opportunities to many. Hence, cities and towns attract people from peri urban areas and also rural areas. At the same time rapid urbanization also exerts demand on various resources like land, water, human, financial and others. Urban areas, especially cities and bigger towns, faces challenges of providing housing, safe drinking water, adequate sanitation, effective transportation, power and energy supply, among others. Such demands also result in adverse effects on environment, leading to climate changes like Urban flooding, soaring temperature and drought etc..

The Urban Local Bodies and other parastatal agencies are designised towards service delivery and action points for implementing plans and strategies to overcome challenges of urbanization. Human Resource Development and professionalization of ULBs are essential for urban transformation, sustainable development and Economic growth.

Many of India's urban planning statutes are outdated and follow regimental approaches through imposition of rigid land use plans and development control regulations. To adapt an ever evolving component like blue-green infrastructure interventions, Indian Cities must move towards dynamic urban planning and governance mechanisms that considers such changes taking place around them. More intensive and transparent digital interfaces, like IT technologies, GIS mapping, MIS interface and live tracking, must be developed by the public sector to ensure real-time monitoring and evaluation of blue-green benefits. This is also necessary to keep up with innovations in urban governance and management, such as environmental real time GIS mapping or using artificial intelligence for sustainable development.

Several Indian cities have witnessed a decline in green and blue features due to rapid urbanization, resulting in adverse climate changes. Blue-green infrastructure provides the "ingredients" for solving urban and climatic challenges by a combination of infrastructure ecological restoration and urban design to connect people with nature, thus making the cities "climate resilient". Blue indicates Water Resources (Lakes, Streams, River, etc.), and Green indicates Natural Habitat (Trees, Parks, Gardens, etc.).

As part of AMRUT mission, kerala, a training cum exposure visit has been taken up for the Senior Town planners of Government of Kerala and other Urban officers of AMRUT to Ahmedabad to get an exposure and firsthand information of all the initiatives carried out in Ahmedabad city and finding the ways and means to replicate the same in Kerala.

Control and Command Centre in Ahmedabad

Ahmedabad's Integrated Control and Command Centre (ICCC) is a state-of-the-art facility designed to enhance urban governance and public services. It monitors city operations, including traffic management, waste disposal, and emergency response, through real-time data analytics. Equipped with advanced technology, the ICCC integrates surveillance, GIS mapping, and IoT-based solutions. It supports efficient decision-making and rapid incident management. The centre is pivotal in advancing Ahmedabad's smart city initiatives.

Waste to Energy Initiative in Ahmedabad:

Ahmedabad has adopted waste-to-energy initiatives to convert municipal solid waste into renewable energy. The city operates a state-of-the-art waste-to-energy plant at Pirana, generating electricity from biodegradable waste. This contributes to reducing landfill burden and promoting sustainable urban management. The initiative aligns with Swachh Bharat Mission goals. It also emphasizes segregated waste collection and recycling to improve efficiency.

Riverfront Development in Ahmedabad:

The Sabarmati Riverfront project transformed the riverbanks into a vibrant urban space, enhancing connectivity and aesthetics. It includes promenades, parks, and recreational facilities, boosting tourism and local engagement. Flood control measures and improved sewage systems have revitalized the river. The development also promotes sustainable urban planning by integrating green spaces. It has become a cultural and social hub for the city.

Heritage Conservation in Ahmedabad:

Ahmedabad, India's first UNESCO World Heritage City, is known for its rich architectural and cultural heritage. Initiatives focus on restoring historic landmarks like Pol houses, stepwells, and mosques. The Ahmedabad Municipal Corporation collaborates with experts to preserve these structures. Heritage walks and cultural festivals promote awareness and tourism. These efforts celebrate the city's legacy while integrating modern urban needs.

Transit-Oriented Development in Ahmedabad:

Ahmedabad has embraced transit-oriented development (TOD) around the Bus Rapid Transit System (BRTS) and Metro corridors. This approach encourages mixed-use urban spaces with higher density near transit hubs. TOD reduces reliance on private vehicles, lowering congestion and pollution. It supports walkability and cycling infrastructure for sustainable mobility. The initiative aims to create livable, accessible, and eco-friendly neighbourhoods.

GIFT City in Ahmedabad:

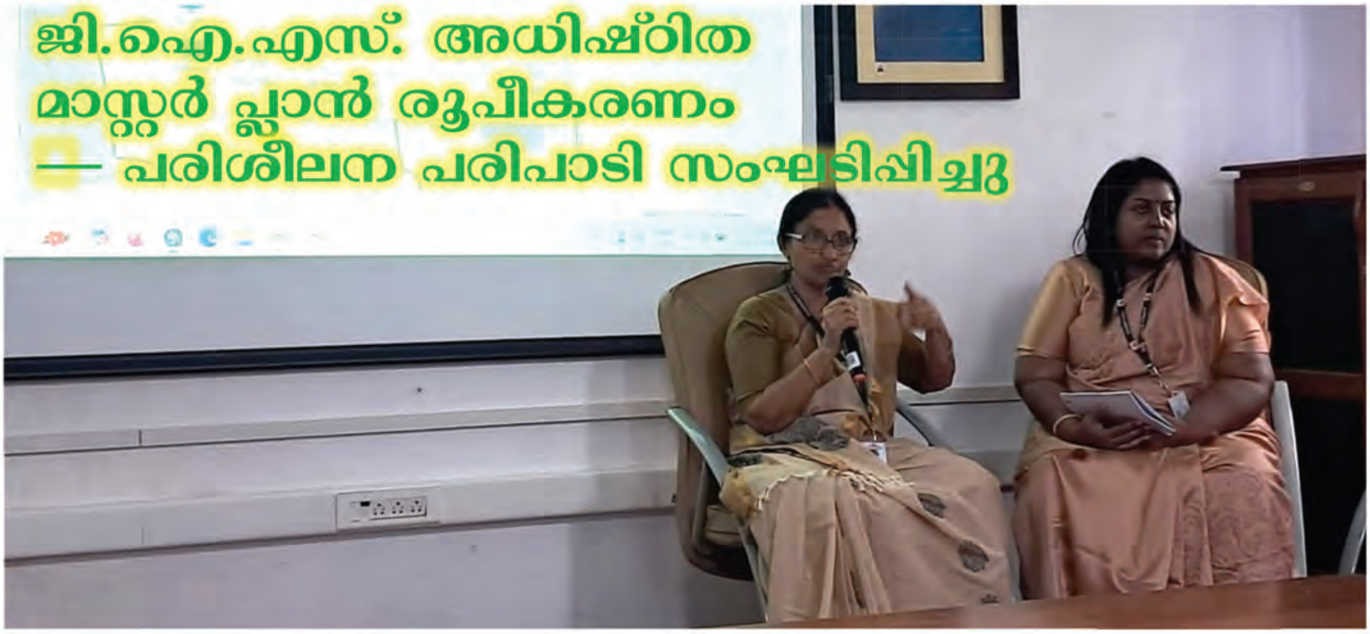
Gujarat International Finance Tec-City (GIFT City) is India's first smart city and international financial services hub. It features world-class infrastructure, including intelligent transportation and energy-efficient buildings. Designed to promote financial services, IT, and fintech industries, it fosters global investment. GIFT City integrates green building practices and sustainable technologies. It is a symbol of India's urban innovation and global business aspirations.

"ക്ലാസ്സ് II നഗരങ്ങളിൽ ജി.ഐ.എസ്. അധിഷ്ഠിത മാസ്റ്റർ പ്ലാൻ രൂപീകരണം" - പ്രഥമ ദേശീയ സംഗമം

അമൃത് 2.0 യുടെ ഉപ പദ്ധതിയാണ് "ക്ലാസ്സ് II നഗരങ്ങളിൽ ജി.ഐ.എസ്. അധിഷ്ഠിത മാസ്റ്റർ പ്ലാൻ രൂപീകരണം". കേരളത്തിലെ 49 നഗരങ്ങൾ ഈ പദ്ധതിയിൽ ഉൾപ്പെടുത്തിയിട്ടുണ്ട്. ഇതിന്റെ ഭാഗമായി കേന്ദ്ര നഗരകാര്യ മന്ത്രാലയം നാഷണൽ റിമോട്ട് സെൻസിംഗ് സെന്ററിൽ 27.11.2024 ൽ പ്രഥമ ദേശീയ സംഗമം സംഘടിപ്പിച്ചു. വിവിധ സംസ്ഥാനങ്ങളിൽ നിന്നുള്ള പ്രതിനിധികൾ സംഗമത്തിൽ പങ്കെടുത്തു. കേന്ദ്ര ഭവന നഗരകാര്യ മന്ത്രാലയ അഡീഷണൽ സെക്രട്ടറി ശ്രീമതി താര ഐ.എ.എസ്. സംഗമം ഉദ്ഘാടനം ചെയ്തു.

വി.എച്ച്.ആർ. & യു.എ.വി. സാറ്റലൈറ്റ് ഡാറ്റ ഉപയോഗിച്ചുള്ള അർബൻ ജിയോ സ്പേഷ്യൽ ഡാറ്റാ ക്രിയേഷൻ, മൊബൈൽ ആപ്പ്, ജി.ഐ.എസ്. ഉപയോഗിച്ചുള്ള നഗരങ്ങളിലെ ഭൂഗർഭ - ഉപരിതല ജല സ്രോതസ്സുകളുടെ മാനേജ്മെന്റ്, അർബൻ യൂട്ടിലിറ്റി മാനേജ്മെന്റ് തുടങ്ങിയ ടെക്നിക്കൽ സെക്ഷനുകൾ നടത്തികേരളത്തിൽ നിന്ന് അമൃത് മിഷനിലെയും, ചീഫ് ടൗൺ പ്ലാനർ ആഫീസിലെയും, അർബൻ ഡയറക്ടറേറ്റിലെയും, തിരഞ്ഞെടുക്കപ്പെട്ട തദ്ദേശ സ്ഥാപനങ്ങളിലെയും ഉദ്യോഗസ്ഥർ സംഗമത്തിൽ പങ്കെടുത്തു.

ജി.ഐ.എസ്. അധിഷ്ഠിത മാസ്റ്റർ പ്ലാൻ രൂപീകരണം — പരിശീലന പരിപാടി സംഘടിപ്പിച്ചു



അമൃത് 2.0 യുടെ ഉപ പദ്ധതിയാണ് "നഗരങ്ങളിൽ ജി.ഐ.എസ്. അധിഷ്ഠിത മാസ്റ്റർ പ്ലാൻ രൂപീകരണം" കേരളത്തിലെ 49 നഗരങ്ങൾ ഈ പദ്ധതിയിൽ ഉൾപ്പെടുത്തിയിട്ടുണ്ട്. അമൃത് മിഷൻ കേരളത്തിൽ നഗരാസൂത്രണ വകുപ്പ് മുഖാന്തിരമാണ് പദ്ധതി നടപ്പിലാക്കുന്നത്. പദ്ധതിയുടെ ആദ്യ ഘട്ടമായ ജിയോ ഡാറ്റാബേസ് തയ്യാറാക്കുന്നതിന്റെ ഭാഗമായി കേരളത്തിൽ പദ്ധതി യ്ക്കായി തിരഞ്ഞെടുക്കപ്പെട്ട 49 നഗരസഭകളിലെയും ജനപ്രതിനിധികൾക്കായും ഉദ്യോഗസ്ഥർക്കായും സംസ്ഥാന തലത്തിൽ പരിശീലന പരിപാടി സംഘടിപ്പിച്ചു. 2024 ഡിസംബർ 12 ന് തൃശ്ശൂരിലെ കിലയിൽ നടന്ന പരിശീലന പരിപാടിയിൽ തിരഞ്ഞെടുക്കപ്പെട്ട നഗരസഭകളിലെ പ്രതിനിധികൾ പങ്കെടുത്തു.

സർവ്വേ ഓഫ് ഇന്ത്യ മുഖാന്തിരം നടത്തുന്ന ഡ്രോൺ സർവ്വേയിലൂടെയാണ് ജിയോ ഡാറ്റാബേസ് തയ്യാറാക്കുന്നത്. നഗരസഭ വഴി ലഭ്യമാകുന്ന മിക്ക സേവനങ്ങളും കാര്യക്ഷമമായി നിർവ്വഹിക്കുന്നതിന് ഈ ഡാറ്റാബേസ് പ്രയോജനപ്പെടും. ഡ്രോൺ സർവ്വേ നടത്തുന്നതിന് നാല് ഏജൻസികളെ ചുമതലപ്പെടുത്തിയിട്ടുണ്ട്.

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Establishing Standards and Essentials for Conventional, Automatic Weather Station (AWS), Automatic Rain Gauge station (ARS) and IoT based Weather Forecasting Technologies and its Utilities.

Introduction:

Weather stations are pivotal for monitoring meteorological parameters, providing critical data for agriculture, disaster management, urban planning, climate studies and water resource management studies. Essential equipment's includes sensors for temperature, humidity, wind speed, and rainfall measurement, tailored to either conventional/analog weather stations (CWS) or automatic weather stations (AWS). AWS and automatic rain gauges (ARS) enhance efficiency by automating data collection and minimizing manual intervention.

Incorporating IoT-based technology further revolutionizes these systems by enabling real-time data transmission, remote monitoring, and cloud-based analytics. IoT integration ensures higher data accuracy, reduces operational costs, and facilitates decision-making across sectors. Establishing standard installation guidelines is critical to ensuring consistent and reliable data. By addressing site selection, calibration protocols, and maintenance schedules, these stations can become robust tools for project areas, fostering data-driven solutions and sustainable development initiatives.

Conventional weather forecasting system

Automatic Weather forecasting system

What is the Difference Between Weather and Climate?

"Weather "refers to **short term** atmospheric conditions while climate is the weather of a specific region **averaged over a long period of time**. Climate change refers to **long-term changes.**

S. No.	Weather	Climate
1	Weather is the Condition of Atmosphere in a specific place at a given point in time, these atmospheric conditions may take place day by day, minutes by minutes or seasonally	Climate is the average weather conditions over a place and it mostly takes place after 25- 30 years of time
2	Weather may involve just one condition of atmosphere.	Climate includes all the conditions of the atmosphere such as Temperature, Precipitation, wind, Humidity, cloud cover and atmospheric pressure.
3	Weather occurs in place within a short period,	Climate is what you expect over a long period.
4	Weather is what you get on a daily Basis	Climate is what one expects over a longer time
5	Weather changes within a short time	Climate changes take place over a longer duration of time.
6	The scientific study of weather is called meteorology, and meteorologist studies weather related aspects.	The scientific study of climate is called climatology and the climatologist study climate.

The common instruments used for the weather measurement are:

Rain gauge:

Rain gauge (also known as udometer, pluviometer, ombrometer, and hyetometer) is an instrument used by meteorologists and hydrologists to gather and measure the amount of liquid precipitation over a predefined area, over a period of time. It is used for determining the depth of precipitation (usually in mm) that occurs over a unit area and thus measuring rainfall amount. The standard instrument for the measurement of rainfall is the 203mm (8 inch) rain gauge. This is essentially a circular funnel with a diameter of 203mm which collects the rain into a graduated and calibrated cylinder. The measuring cylinder can record up to 25mm of precipitation.

Why copper used as Rain gauge?

Copper has been used because it will not go rusty. It is also good at preventing mold growing in the damp conditions. This type of rain gauge is quite expensive.

There are Five types of Rain Gauges:

- **Graduated Cylinder Rain Gauge (Standard Rain Gauge):** This gauge collects rainfall in a cylindrical container marked with measurement lines (usually millimeters). Rainfall is measured by directly reading the height of the water in the cylinder. It's simple, cost-effective, and widely used in manual observations
- **Tipping Bucket Rain Gauge:** This gauge uses a funnel to direct rain into a small bucket balanced on a pivot. Each time the bucket fills and tips, it records a measurable amount of rainfall. It is often connected to data loggers for automated precipitation recording.
- **Weighing Precipitation Gauge:** This gauge weighs the collected precipitation (rain, snow, etc.) in a container. The weight is converted to an equivalent precipitation amount. It provides accurate readings and is ideal for all forms of precipitation, including snow.
- **Optical Rain Gauge:** This sensor-based gauge uses light beams to detect raindrops. As raindrops pass through the beams, the sensor measures the drop size and calculates the rainfall rate. It is suitable for real-time monitoring and remote applications.
- **Acoustic Rain Gauge:** This type of rain gauge uses Soundwaves to measure the size and frequency of raindrops. An acoustic sensor sends a signal to a computer, which calculates the amount of rainfall based on the data received.

Graduated Cylindrical Rain gauge

Tipping Bucket Rain Gauge

Weighing Precipitation Rain gauge

Optical Rain Gauge Sensors

Acoustic Rain Gauge

How to Quantity Rain Gauge measurements?

1 cm of rainfall means that a volume of water equal to 10 L has fallen over an area of 1 m^2; ergo, the basic conversation for rainfall depth (say mm) to volume is: 1 mm of rainfall depth equates to 1L of rainwater per m^2.

The amount of precipitation in millimeters is numerically equal to the number of kilograms of water per square meter.

15 mm of precipitation means 15 kilograms of water per square meter of the Earth's surface, and that's quite a large amount — one and a half buckets of water. Given the fact that the Earth's surface is uneven, precipitation flow into low-lying areas, forming turbulent streams and deep puddles.

Description of Rain guage Measurements

2. Wind (Speed & Direction) Anemometer & Wind vane,

The instruments used to measure wind are known as anemometers and can record wind speed, direction and the strength of gusts.

The normal unit of wind speed is the knot ***(nautical mile per hour = 0.51 m sec-1 = 1.15 mph).*** Wind direction is measured relative to true north ***(not magnetic north)*** and is reported from where the wind is blowing. An easterly wind blows from the east or 90 degrees, a southerly from the south or 180 degrees and a westerly from the west or 270 degrees.

Wind anemometer and Wind wane

Wind speed is normally measured by a cup anemometer consisting of three or four cups, conical or hemispherical in shape, mounted symmetrically about a vertical spindle. Wind direction is measured by a vane consisting of a thin horizontal arm carrying a vertical flat plate at one end with its edge to the wind and at the other end a balance weight which also serves as a pointer. The arm is carried on a vertical spindle mounted on bearings which allow it to turn freely in the wind. The anemometer and wind vane are each attached to a horizontal supporting arm at the top of a 10 m mast.

3. Pressure sensor (Barometer):

Barometers measure the atmospheric pressure. Atmospheric pressure is an indicator of weather. Changes in the atmosphere, including changes in air pressure, affect the weather. Meteorologists use barometers to predict short-term changes in the weather.

Conventional Barometer

Digital Barometer

4. Thermometer:

The mercury thermometer is a device commonly found within amateur weather stations. It consists of a glass bulb connected to a stem, in which liquid mercury is placed. Thermometers are used to measure the temperature and this is a very important part of weather forecasting. Many thermometers come in a glass tube that contains a liquid, usually mercury or alcohol. The liquid expands when it's hotter and contracts when it is colder. There are three commonly used measurement systems: **Fahrenheit, Celsius and Kelvin.**

Thermometer

5. Hygrometer:

- Relative Humidity is the amount of water vapor that is present in the atmosphere at any specific time. Water vapor is nothing more than water in a state of gas *(after the liquid has evaporated)*. Although humidity and its effects can usually be felt, it is normally invisible to the naked eye.
- Relative humidity (RH) refers to the moisture content (i.e., water vapor) of the atmosphere, expressed as a percentage of the amount of moisture that can be retained by the atmosphere (moisture-holding capacity) at a given temperature and pressure without condensation.
- When the humidity is at 95%, it means that the air has soaked up most of the moisture already and can only soak up 5% more.
- Anything higher than 50 percent is considered high. High humidity levels and excessive moisture can cause discomfort and health issues, and it can even wreak havoc on a home.

Digital Hygrometer **Analog Hygrometer**

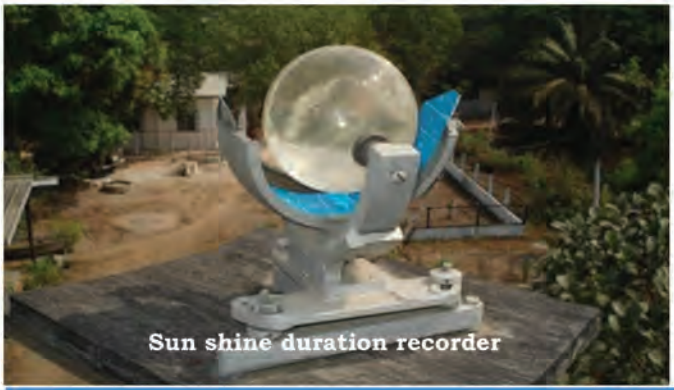
6. Lightening Detectors:

The lightning detector system uses a radio that listens for lightning at 500 kHz, it listens for a particular radio signal pattern. The lightning signal pattern is generated by the electrical "spark", that is the lightning itself.

Lightening Detectors

7. Sunshine Duration.

Sunshine is recorded with a simple, yet clever device, called a Campbell-Stokes recorder, the design of which goes back to 1879. In this device a glass sphere concentrates sunlight onto a card and the amount of scorching on the card records the amount of sunlight that had fallen on it.



Sun shine duration recorder

Nowadays, sunshine duration sensors like the Kipp and Zonen are commonly used along with pyranometers and pyrheliometers. These provide extremely accurate data, with which sunshine duration calculations can be made.

Guidelines and setting Standards for conventional analog or automatic Weather station (AWS) and Automatic Rain Gauge (ARS) stations in project areas.

Conventional Weather station setting Standards:

Proper siting of a location for traditional weather station can be very challenging, especially in an urban or suburban setting. Generally speaking, avoid obstructions and anything that may cause a biased reading, such as dark surfaces, or materials that cool slowly, such as concrete. In most cases, you will have to make compromises, but the closer you are to the standards, the better the data. "Climate-quality" data is best collected in areas where sources of potential bias (such as introduction of surrounding structures and changes in land use) are kept to a minimum.

The traditional Weather station is ideally mounted at a height of **4 to 6 feet above the ground.** Ideally located at a horizontal distance of 4 times the height of the nearest obstruction. Stevenson screens are always installed so that the door opens facing north, to keep the sun from shining directly on the thermometers and affecting the readings. The stand of the Stevenson screen should be set in the ground so that the bulbs of the thermometers are at approximately 1.2m (120cm) above the ground. **Stevenson screens** are always painted white to better reflect the sun's rays. The sides and floor are made of louvers or slats to allow free circulation of air and to keep off direct sun rays. It has an insulated roof to create a bad conductor of heat. This is done by creating an air space between the layers of the roof. The louvered sides allow outside air to flow around the thermometers. The screens are ground by legs to avoid strong temperature gradients at ground level, has louvered sides to encourage the free passage of air, and is painted white to reflect heat radiation, since what is measured is the temperature of the air in the shade, not of the sunshine. They protect the temperature sensors from being influenced by direct or reflected sunlight. This type uses instruments to measure temperature, including maximum and minimum, and humidity, which are kept in a white louver screen ("Stevenson screen") to keep sunshine from warming up the instruments.

Temperature / Humidity related instrument: it should be placed on a patch of level ground, over a surface representative of the area. [Avoid rock/concrete and dark-colored surfaces, roofs, or irrigated lawns. It should be mounted in a ventilated radiation shield. Height between 4' 1" and 6' 7" above ground (1.25 – 2.0 m). Place sensors at a horizontal distance of 2 times the height of the nearest object (tree, structure, etc). [Example: 40 feet away from a 20 foot tall tree]. Keep away from other sources of heat such as chimneys, air vents, air conditioners, etc.

The thermometers indicating extreme temperatures over a period of time are called Maximum or Minimum thermometers. The Maximum and Minimum thermometers are mounted horizontally inside the Stevenson Screen with the minimum thermometer slightly tilted.

All 4 thermometers are mounted inside the Stevenson screen to protect them. Maximum and minimum thermometers, as their names suggest, register the highest and lowest temperatures since the last observation.

Alongside the Steve screen is a rain gauge on the ground. Wind measurements can be made with anemometer and pressure using a barometer sun's radiation by sunshine recorder.

Rain Gauge: ideally mounted at a height of 4 to 6 feet above the ground. It is ideally located at a horizontal distance of 4 times the height of the nearest obstruction. Ensure the gauge is mounted level to the ground, away from any horizontal surface that can introduce rain-splashing.

Anemometer: ideally mounted at 32.8 feet (10 meters) above ground level. It is ideally placed at a horizontal distance of 10 times the height of the nearest obstruction. When placed on the side of a mast (rather than at the top), the sensor should be placed on a horizontal boom extending outwards from the mast, at a distance of 3 times the mast diameter. [So, if mounted on a 2-inch diameter pole, the boom should extend out 6 inches away from the pole].

Sunshine recorders and radiometers: should be installed in a location where solar radiation is not shaded by trees or buildings in any season from sunrise to sunset and where there are no smoke emission sources.

Setting up of Automatic Weather station:

Norms for Site selection:

- As the site to be selected should be on favorable ground conditions but because of the fact of its security, it is proposed to be placed on high rise buildings from the security perspective.
- The proposed AWS site must be free from obstructions like tall buildings, trees etc.
- The site should be free from any encumbrance and a clear written acceptance/statement should be there on record.
- Surroundings should be assessed for potential obstructions to selected sensors. Potential sensor contaminants (e.g., water and dust sources) should be identified.
- Security aspect has to be given due consideration so as to avoid theft of AWS equipment.
- Location of the site on the edge of a slope, hillocks, cliff or inside a valley should be avoided
- It should not be placed near heat sources like chimney/A/C vent and other heat sources should be avoided.
- Location nearby to the High tension wires to be avoided.
- As it is planned to place the AWS and ARS on tall buildings due to security perspective, the remaining ground condition norms are not highlighted.
- The selected site should be geo-coded and placement mark on the map to be recorded.

The major parameters that need to be measured in AWS are:

- ⇒ **Air temperature**
- ⇒ **Relative Humidity**
- ⇒ **Atmospheric pressure**
- ⇒ **Rainfall**
- ⇒ **Wind speed**
- ⇒ **Wind Direction**
- ⇒ **Lightening detector**

An additional Parameter of solar radiation followed by soil moisture and temperature can also be considered based on the budgetary outlay of the proposed project.

The meteorological data collected by the AWS can be communicated to the desired places mainly in two ways:

a) **Satellite Communication**

b) **GSM/GPRS Network.**

Again, the data communication factor depends on the budgetary allocation. It would be good, if GSM based (mobile phone based data) acquisition and analysis will be better and simple in approach. The data transfer depends up on the mobile network strength in project areas.

The main components of an AWS/ARG station are:

- ⇒ **Data Logger**
- ⇒ **Transmitting Antenna**
- ⇒ **Battery**
- ⇒ **Solar Panel**
- ⇒ **Sensors**
- ⇒ **GPS antenna**
- ⇒ **Server for GSM network.**

The desirable standards of setting AWS are:

Parameter	Desirable Height above which it is to be installed	Characteristics
Air temperature	2-3 meters above from basement	-20^0 C to $+60^0$ C, Accuracy: ± 0.2^0 C, Resolution: 0.1^0 C
Relative humidity	2-3 meters above from basement	0% to 100%, Accuracy: ± 3%, Resolution: 1%
Rainfall	1 m to 1.5mts	Accuracy: (+ / -) 2% at 240 mm/hr Resolution: 0.5 mm
Wind speed	7m to 10m	1.2 m/s
Wind direction	7m to 10m	+/-5 degree
Additional Parameters: (if required)		
Global Solar radiation	2-3 meters above from basement	
Soil Temperature	-20 cm (beneath Ground)	+/- 0.4 degree
Soil Moisture	-20 cm do--	

General Guidelines for format of Data:

- ⇒ Daily maximum and daily Minimum Temperature.
- ⇒ Daily maximum and daily minimum Wind Speed.
- ⇒ Daily maximum wind gust.
- ⇒ Daily maximum and minimum value of Relative Humidity
- ⇒ Hourly Rainfall or daily rainfall,
- ⇒ Battery voltage on Hourly Basis.

What is weather forecasting?

Weather forecasting is the prediction of atmospheric conditions based on location and time. Every location will have its weather projections, making it relatively simple for farmers to know how and when to move. As a result of the interaction between weather and agriculture, precise weather forecasting is required for farmers to make informed decisions that will not result in losses. Temperature, sunlight, and rainfall all have a significant impact on crops. Temperatures, as well as proper water and food, are critical for pest and diseases.

In simple words, weather forecasting can be roughly understood as a prediction or a statement indicating how and what will be the weather likely be the next day or the next few days.

Weather forecasting helps to determine the future climatic changes which are about to take place so that we as individuals can be prepared for that change say if the weather forecast of tomorrow predicts that it is going to be a sunny hot day, keeping that in mind we are most likely to keep ourselves hydrated and avoid going out in hot weather conditions.

Types of Weather Forecasting.

1. Short-range weather forecasting:

This forecast will be valid for 1-2 days. The weather has a huge impact on people's daily routines, food production, and personal comfort zones. Forecasting is important in the planning of existing and future operations. As a result, several other factors could have a significant impact on the forecasting results.

Data sheet of Weather station:

Data Recording Sheet for Weather Station Data

Group ______ Names: ______

Location of weather station:								
Date (Month/Day)	Time of Day	Temperature (°C)	Barometric Pressure (hPa)	Wind Speed (km/h)	Wind Direction	Relative Humidity	Rainfall (mm) Snowfall (cm)	Description of Conditions

Accurate forecasting, on the other hand, is critical. Forecasting is a useful tool for a variety of investigations. The most accurate global model is the ECMWF. The ECMWF outperforms the GFS by a wide margin.

2. Medium range weather forecasting

This type of prediction might last anywhere from 3-4 days to 2 weeks. Following the nature of the firm, medium-term predictions are created for modest strategic resolutions.

They are particularly essential in the domain of corporate planning and development, and firm budgets are determined based on this forecast. Inaccurate forecasting can have major consequences for the rest of the company; the company will be obliged to keep unsold goods and will have to spend more money on production.

3. Extended range weather forecasting.

This type of forecast is valid for a period ranging from ten days to four weeks. This kind of forecast is employed in a variety of fields, including agriculture. This form of forecast is mostly used to indicate divergence from the normal.

Matter of Prime Concern in setting up of Weather station:

The vendor should be a Government Certified agency for selling the sensors and equipment's.

There should be a Guarantee and AMC with the vendor on purchase of conventional weather equipment's, AWS and ARS with defined terms and conditions.

About 3 or 4 vendors quote can be taken and the best quote based on the lowest cost and quality equipment and further services are to be worked out.

IOT BASED WEATHER STATION SET UP AND ITS UTILITY:

The IoT based Weather Station project involves the development of a sophisticated weather monitoring system powered by Internet of Things (IoT) sensors. This system aims to collect real-time meteorological data, including temperature, humidity, wind speed, and more. The collected data is then displayed on a user-friendly interface or a mobile app, providing users with up-to-the-minute weather information for their location.

Objectives:

Real-time Data Collection: Implement IoT sensors to continuously gather weather data such as temperature, humidity, air pressure, wind speed, wind direction, and precipitation levels.

Data Accuracy: Ensure the accuracy and reliability of collected weather data through sensor calibration and quality control measures.

User-Friendly Interface: Develop an intuitive and accessible user interface that presents weather information in a clear and user-friendly manner.

Mobile App Integration: Create a mobile application that allows users to access real-time weather updates on their smartphones and receive notifications for severe weather conditions.

Data Storage: Store historical weather data for analysis and trend monitoring, enabling users to access past weather records.

Alerts and Notifications: Implement automated alerts and notifications for significant weather events, such as storms, heat waves, or heavy rainfall.

Outcomes:

Accurate Weather Information: Users will have access to precise and up-to-date weather data for their location, aiding in better decision-making for outdoor activities, travel, and planning.

Improved Safety: Timely alerts and notifications for severe weather conditions enhance user safety by allowing them to take necessary precautions.

Data Analysis: The stored historical weather data can be used for trend analysis, climate research, and studying long-term weather patterns.

Mobile Accessibility: The mobile app ensures that users can access weather updates on the go, making it a valuable tool for travelers, hikers, and outdoor enthusiasts.

Educational Value: The project can serve as an educational resource for students and researchers interested in meteorology and IoT technology.

Community Engagement: By sharing weather data with the community, the project fosters a sense of engagement and collaboration among users interested in local weather conditions.

Benefits of Weather Reporting System Using IoT.

With the Internet of Things, weather monitoring systems have stepped up their game, becoming more accurate, consistent, and quicker in operation. Now, that sounds great, but what does this tech actually offer businesses? Here are the main benefits:

Real-time data collection. Thanks to IoT devices and sensors, businesses get weather updates from all sorts of locations right when they need them.

Higher accuracy. A weather monitoring system using IoT gathers data from numerous sources, providing a detailed picture of what's happening with the weather.

Wider coverage. Traditional weather monitoring systems usually check conditions at just a few weather stations, leaving out other areas. When IoT technology steps in, businesses can cover more places, even the most distant ones.

Predictive analytics. IoT-powered weather reporting systems use historical data and current trends to tell businesses what's coming. That's how companies can adjust their operations before any weather-related challenges appear.

Reduced response time. Every second counts when the industry is about making fast decisions — aerospace or emergency services. That's where IoT weather monitoring comes in as a solution, offering real-time insights for rapid response times.

Cost-effectiveness. A weather reporting system using IoT allows companies to optimize resource usage and reduce waste. For example, agriculture businesses can leverage weather forecasts to adjust their irrigation and crop protection measures.

Increased safety. Industries prone to weather-related risks, like construction or transportation, enjoy the advantages of IoT-based automatic weather stations. These businesses can plan their activities more safely with a minimum of accidents and disruptions.

On line Weather reporting through Internet of Things (IoT) and data acquisition in Mobile phones.

Role of an IoT System in Weather Monitoring:

The Internet of Things (IoT) has revolutionized how we live and work and has also introduced new possibilities in weather monitoring. Traditional weather reporting systems rely on manual data collection methods, which can be time-consuming and prone to errors. With IoT technology, real-time weather data can be collected, analyzed, and transmitted wirelessly, providing accurate and timely information for various use cases. Due to unpredictable weather conditions caused by rapidly changing climate, the Weather Reporting System monitors and regulates weather in different areas like homes, industry, and agriculture. A smart environment has **sensor devices, microcontrollers, and software applications, enabling autonomous monitoring and protection.** IoT devices, like sensors and weather stations, can be strategically placed in different areas. They collect data on temperature, humidity, wind speed, precipitation, and other weather parameters. These devices wirelessly transfer data to a central location for processing and analysis.

The various Sensors available are:

- **Temperature and Humidity Sensor:** Measures air temperature and humidity.
- **Barometer**: Measures atmospheric pressure.
- **Anemometer:** Measures wind speed.
- **Rain Gauge:** Measures precipitation.
- **Data Logger:** Records data from various sensors.
- **Microcontroller/Processor:** Processes and potentially transmits data

  (e.g., Arduino, Raspberry Pi).
- **Display Unit (Optional):** For local data visualization

  (e.g., LCD screen).
- **Power Supply:** Battery or solar power.
- **Communication Module (Optional):** For remote data transmission

  (e.g., Wi-Fi or GSM module).

Setup:

- **Installing Sensors:** Placing sensors in open areas away from obstructions to ensure accurate readings.
- **Connecting Sensors to Microcontroller:** Wire sensors to the microcontroller, ensuring correct calibration.
- **Program Microcontroller:** Write or use existing code to read sensor data and log it. You might use libraries specific to your sensors.
- **Data Management:** Decide how to store or display data. Options include local storage on an SD card or sending data to a cloud server.
- **Power Management:** Ensure a reliable power source. Solar panels can be used for sustainability.

Maintenance:

- **Regular Calibration:** Check and calibrate sensors periodically to maintain accuracy.
- **Battery Replacement:** Replace batteries or maintain solar panels as needed.

Various IOT based Integration Mechanism with Weather Station data:

The various Integration Ideas which can be thought- off of are

- **Combine Systems:** Integration weather data with water supply control. For example, adjust water usage based on rainfall data to conserve water.
- **Remote Monitoring:** Use IoT (Internet of Things) technology to monitor and control both systems remotely.

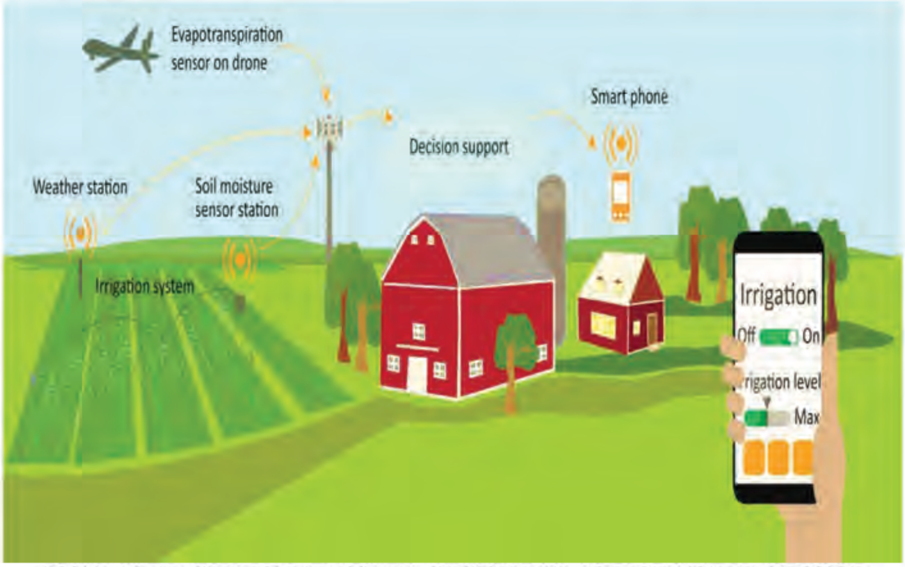
This setup will vary depending on specific needs and the environment in which these systems are installed, but these guidelines provide a good starting point.

Also, setting up a local-level weather station and integrating it with disaster management involves both the technical aspects of weather monitoring and the organizational aspects of preparing for and responding to weather-related emergencies.

IoT plays a key role in weather monitoring systems and its Usage in different Sectors:

Agriculture Sector:

Weather forecasts help farmers make well-informed decisions on crop selection, watering schedules, and pest control. Farmers can receive accurate soil moisture levels and plant growth data with real-time monitoring, ensuring optimal crop yield.



IOT BASED SMART WEATHER SYSTEM IN AGRICULTURE SECTOR

Urban Planning:

City planners can benefit from real-time weather data to better manage resources and infrastructure. For instance, with advanced warnings of heat waves or heavy rainfalls, they can prepare emergency services accordingly and prevent potential disasters.

Tourism:

Weather plays a significant role in tourism, and real-time weather monitoring can greatly enhance the experience for travelers. Accurate weather forecasts allow tourists to plan their activities accordingly, making their trip more enjoyable and hassle-free.

Healthcare:

Real-time weather data is crucial for healthcare facilities to prepare for extreme temperatures or natural disasters. With IoT-based sensors, hospitals can monitor indoor and outdoor temperatures, humidity levels, and air quality to maintain a safe patient environment.

Water Resources Management:

The Real-time data helps decision-makers adjust water distribution based on current weather conditions, reducing water wastage and ensuring availability during dry periods. The sensors Predicting extreme weather events like floods or droughts allows for proactive measures to protect water resources and infrastructure. Early warning systems can also mitigate damages. In agricultural applications, weather data combined with soil moisture sensors can optimize efficient irrigation strategy, ensuring that crops receive the right amount of water. Managing water resources efficiently reduces energy consumption in water treatment and distribution, especially when automated systems can adjust pumps and valves based on weather forecasts. The Automation, predictive maintenance of infrastructure, and precise water management reduce operational costs.

Water Quality Monitoring:

Real-time monitoring of water quality parameters helps in the timely detection of contamination events, ensuring safe drinking water and healthier ecosystems.

Reservoir Management:

Sensors can monitor water levels, inflows, and outflows in real time. Coupled with weather forecasts, operators can make decisions about releasing or storing water to prevent flooding or water shortages.

Aquatic Ecosystems:

Monitoring weather and water quality together helps maintain healthy aquatic ecosystems, preventing harmful algal blooms and ensuring oxygen levels remain sufficient for aquatic life.

Water Supply System:

⇒ **Water Source:** Can be a well, tank, or municipal supply.

⇒ **Pump:** To move water from the source to the desired location.

⇒ **Pipes and Valves:** For distribution and control.

⇒ **Filtration System:** To ensure water quality (optional, based on source).

⇒ **Water Meter:** To monitor usage.

⇒ **Controller:** For automating and monitoring the system (e.g., microcontroller with sensors).

Setup:

⇒ **Install Pump and Pipes:** Set up the pump to draw water from the source and lay out pipes to direct water to where it's needed.

⇒ **Install Filtration (if needed):** Place filters to purify water if necessary.

⇒ **Connect Water Meter:** Attach to the main line to track consumption.

⇒ **Set Up Controller:** Program a microcontroller to manage pump operation, monitor water levels, and control valves.

Maintenance:

- **Regular Inspection:** Check pumps, pipes, and filters for leaks or blockages.
- **Water Quality Testing:** Regularly test water to ensure it remains clean and safe.
- **System Calibration:** Ensure sensors and meters are accurately calibrated.

Optimizing Water Usage:

- **Precipitation Data:** Accurate rainfall measurements from the weather station help in predicting water availability. For instance, if recent rainfall has been significant, it may reduce the need for irrigation or other water uses, thus conserving stored water.
- **Evaporation Rates:** Monitoring temperature and humidity can help estimate evaporation rates. This is particularly useful for managing water in reservoirs, ponds, or irrigation systems, ensuring that water resources are used efficiently.

Improving Water Resource Management:

- **Forecasting Demand:** By analyzing weather trends, you can predict periods of high-water demand (e.g., during heatwaves) and adjust water supply schedules accordingly. This helps in balancing supply with anticipated demand.
- **Seasonal Adjustments:** Weather data allows for adjustments in water supply and conservation strategies based on seasonal patterns, such as reducing water use during rainy seasons and increasing it during drought periods.

Enhancing System Efficiency:

- **Leak Detection:** Correlate weather data with water usage patterns to identify unusual spikes in demand that might indicate leaks or inefficiencies in the system.
- **Maintenance Scheduling:** Weather data can help schedule maintenance activities during periods of lower water demand or favorable weather conditions, minimizing disruptions to water supply.

Setting up a micro-level weather station can significantly enhance the management of a water supply system by providing real-time meteorological data that informs water usage, conservation strategies, and system efficiency.

Future Outlook:

- **AI/ML Integration:** As machine learning algorithms become more sophisticated, predictive models can offer more accurate forecasts for water levels and quality.
- **Integration with Digital Twins:** Digital twins of water bodies and related infrastructure can simulate various weather conditions and their impacts on water resources, allowing for better planning and management. By implementing such a system, water management authorities can take a data-driven approach to ensure the sustainable and effective use of water resources.

Disaster Management Integration with Weather stations:

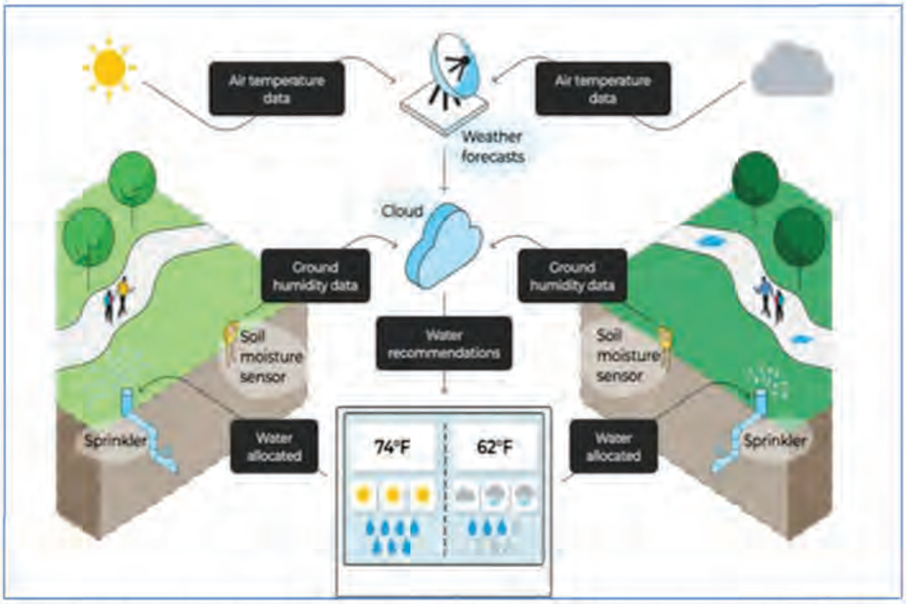
IoT-based weather monitoring systems can help predict natural disasters like hurricanes, floods, and snowstorms. With accurate data, authorities can issue timely warnings and take necessary precautions to minimize damage.

Early Warning System:

- **Threshold Alerts:** Set up thresholds for various weather conditions (e.g., heavy rainfall, high wind speeds) that trigger alerts.
- **Notification System:** Implement an alert system that can send notifications via SMS, email, or push notifications to local authorities and residents.
- **Local Authorities:** Share real-time data with local disaster management authorities to aid in timely decision-making.
- **Public Access:** Provide a platform or app where residents can access weather data and alerts.

Emergency Response Plan:

- **Protocols:** Develop and document protocols for different types of weather-related emergencies (e.g., floods, storms, landslides, earthquake, Tsunami etc).
- **Training:** Train local emergency responders and community members on how to respond to alerts and how to use the data provided by the weather station.



SMART IRRIGATION WATER RESOURCES MANAGEMENT BASED ON WEATHER PREDICATION AND IOT TECHNOLOGY.

Collaboration:

- **Community Involvement:** Engage with local community organizations and schools to raise awareness and ensure everyone knows the procedures during an emergency.
- **Partnerships:** Collaborate with meteorological services or other local weather stations for more comprehensive data and forecasting.

Simulations and Drills:

- **Regular Drills:** Conduct drills and simulations to test response procedures and the effectiveness of communication channels.
- **Review and Improve:** After drills or actual emergencies, review the effectiveness of the response and make necessary adjustments to protocols.

Additional Considerations:

- **Backup Systems:** Have backup power sources and alternative communication methods in place in case of power outages or communication failures.
- **Data Security:** Ensure that data collected by the weather station is secure and that there are measures in place to prevent tampering or unauthorized access.

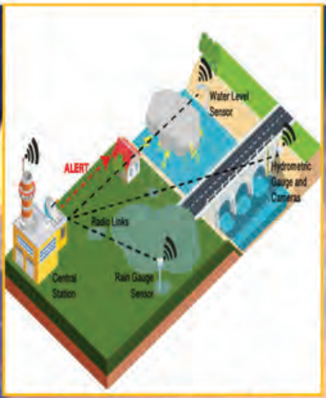
Setting Up of IOT based weather station and sensors in Disaster prone Towns:

Imagine setting up a small weather station in a coastal town prone to cyclones/storms. We shall install the following:

- **Install Sensors:** Place sensors on a high, unobstructed area to measure wind speed, temperature, humidity, and precipitation
- **Program Alerts:** Set thresholds for high wind speeds and heavy rainfall that trigger automatic alerts to local emergency services.
- **Data Integration:** Share data with a centralized disaster management system and provide residents with access to real-time weather information through a local website or app.
- **Emergency Plan:** Develop and communicate a comprehensive emergency response plan that includes evacuation routes and shelters.

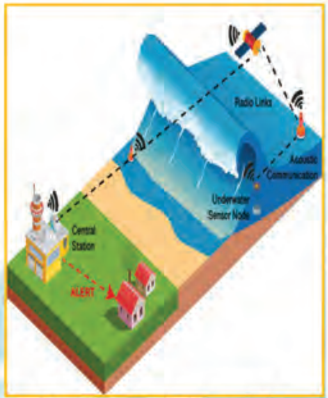
This approach ensures that the local weather station not only provides valuable meteorological data but also plays a crucial role in disaster preparedness and response.

Implementation of a Landslides Early Warning System based on the IoT and underwater sensors.



Implementation of a Flood Early Warning System based on the

Implementation of an Earthquake Early Warning System based on the IoT and wave detection.



Implementation of a Tsunami Early Warning System based on the IoT and underwater sensors.

Disaster Preparedness and Response:

- **Flood Management:** Real-time rainfall data helps in managing water levels in reservoirs and preventing potential flooding. This is crucial for maintaining infrastructure integrity and avoiding property damage.
- **Drought Response:** Long-term weather trends can indicate drought conditions, allowing for early intervention measures such as water rationing or conservation initiatives.

An IoT sensor-based weather station can significantly enhance disaster preparedness for events like floods, landslides, earthquakes, tsunamis, and droughts. By monitoring real-time data on temperature, humidity, rainfall, soil moisture, air pressure, and seismic activity, these systems can help detect early warning signs. For floods and landslides, rainfall and soil moisture sensors predict saturation levels. Seismic sensors identify tremors, offering potential earthquake alerts. In coastal regions, water pressure and tide sensors detect early tsunami signs. Drought-prone areas can use data on prolonged low rainfall and soil dryness for resource planning. **This IoT-driven approach supports rapid response and informed decision-making, reducing disaster impacts.**

Conclusion:

The apt implementation of IoT technology and advanced weather prediction systems has the potential to revolutionize agriculture, water resource management, disaster predictions and other utilities. By enabling real-time data collection, analysis, and communication, IoT devices empower farmers to optimize crop yields, enhance resource efficiency, and mitigate the risks of unpredictable climatic conditions. In water resource management, IoT solutions ensure sustainable utilization and conservation of water through precise monitoring and decision-making. IoT-based weather prediction plays a pivotal role in water supply, distribution, and quality management by leveraging real-time weather data to optimize operations. IoT sensors monitor rainfall, temperature, and humidity, enabling precise forecasting of water demand and availability. This data supports efficient water distribution by predicting peak usage periods and mitigating wastage. Additionally, IoT systems ensure water quality by integrating weather data to anticipate contamination risks, such as runoff during heavy rains. Furthermore, integrating IoT with weather prediction systems strengthens disaster preparedness by providing early warnings, enabling rapid responses, and minimizing damage to life and property. Embracing these technologies not only promotes resilience and sustainability but also paves the way for smarter, more efficient resource management in a rapidly changing world.

"IOT based Weather predictive Technologies Promote Sustainability, Resilience, Smarter Water management, Agriculture and Disaster preparedness Practices Revolutionizing Community Well-Being as a Prime focus."

AMRUT 1
PROGRESS

- EXPENDITURE % - 94 %
- EXPENDITURE - 2191.31 Cr.
- COMPLETED WORKS - 998 Nos.
- ONGOING WORKS - 113 Nos.
- TOTAL WORKS - 1111 Nos.

AMRUT 2.0
PROGRESS

- EXPENDITURE % - 14.76 %
- EXPENDITURE - 335.73 Cr.
- COMPLETED WORKS - 75 Nos.
- ONGOING WORKS - 665 Nos.
- TOTAL WORKS - 740 Nos.

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