

...WOW, full !

Can't Devour It

Watermaker to SDG 6.1

**SDG 6.1 what get by SDGC ?
(Solar Desalination Geoassisted Continuous)**

Watermaker - SDGC toward SDGs/UN 6.1

(Target 6.1: By 2030, achieve universal and equitable access to safe and affordable drinking water for all).

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Can't Devour It

Chapter 1:

I took a sip of my beer as my brain tortured me with the thought of how I was sitting here wasting money on alcohol when we can't afford to buy water for a week. The price for one gallon just went double over a month. We made sure to ration the water at home but mother had diarrhea so she had to drink more not to end up getting dehydrated. The noise of waves hitting the beach next to the bar I was sitting in was piercing my ears. We're surrounded by water but we can't devour it as we want. I sighed at my own helplessness because that's all I could do right now.

"Maria, I'm not a good person. I'm leaching off of everyone here, yes you too Maria. God is never going to forgive me for this. My mother might come out of her grave to scold me for it." A dark haired guy sitting on a chair next to mine was blabbering with his head in his hands as he sat on the counter talking to the bar owner, Maria. I remember playing volleyball with Luca several times when we were little. I remember him being some

years older than me. I remember hearing it from my mother that he went to a University in the city before me.

“Luca, you don’t have to blame yourself for what they are doing.” Maria patted his back while consoling him.

Maria was a kind middle aged lady, who was running this bar that she had inherited from her father and him from his. She was always a good listener; I had myself drunk ranted several times to her. She has a way to make the other person feel better. From her warm smile that she gives as a customer enters her bar to the free therapy sessions like this. Everyone on the island knew how considerate she was.

“No Maria, they are literally pulling the water out of the ground with some pumps and selling here for 10 times the price it should be.” Luca said as he gulped down his scotch in one shot. My eyes widened at the information that I was getting. I knew the companies were making profits but not this much. I was suddenly interested in Luca’s rant now. My eyes were stuck on the shelf with empty bottles that Maria had put up for décor, behind the counter but my ears were stuck to eavesdrop on their conversation.

“Did you see the UN SDG 6.1?” Luca grabbed his phone out of his back pocket and started taping and scrolling on

it. “Here, it says that ‘by 2030, achieve universal and equitable access to safe and affordable drinking water for all.’ Do you really think this is going to happen? It’s been years and we’ve been suffering. Our fathers did and so did theirs and it’s just getting worse. They are just words giving us false hope.”

The words that Luca just said engraved in my mind. I wanted to achieve that somehow, the world where everyone had access to water to drink and cook. My island, my family having water without spending half of their month’s earning on it. Yes, this sounded too good to be true right now.

“I heard Longo’s boy almost died because he got thirsty and gulped down water from the sea.” This was normal around here, since children didn’t get much to drink at home, while playing they get thirsty and resort to drinking sea water to calm their thirst. I had several friends having near death experience because of it back when I was young. Our mothers wouldn’t let us play around much when we were short on water.

“I wish we had something to turn all this water around us into drinking water. It’s like the sea is continuously teasing us with its waves that we can’t drink from it.” Maria sighed as she poured another scotch for Luca.

My mind started racing with all the ideas right there, I had pictures of all the parts of the device working together in synchronization flash in front of my eyes. All the passion for my degree, Mechanical Engineering was bubbling in my blood with excitement.

“Maybe- we can.” I said it out loud unconsciously before I could even realize it. I looked turned my neck to the side to find two dark brown eyes staring at me in confusion. “I mean, maybe we can make the water around us drinkable and useable.”

“How?” Luca seemed interested but I had no clue how yet. I had just the initial lay out of the device in my head but not the entire plan.

“I don’t know, it’s a maybe but we can make a device ourselves.” Luca immersed himself in his own thoughts for a minute before looking at me again.

“How will this device work? Chemical purification, maybe? Sea water is high in salt content how are we going to make it drinkable?” Luca was already coming up with the ideas for the mechanism of the device. Now I remember his major was Chemical engineering.

“I was thinking more on the lines of Reverse Osmosis.” I stated before taking a sip from my bottle.

“Brilliant Giuseppe! No wonder you went into that University on scholarship.” Luca knew my name even about my university and that I scored a scholarship too? Everyone does know everyone on this island.

“Maybe you two should talk more about it, I have to take out the trash.” Maria opened a new bottle of beer and slid it in my direction, “This one is on the house, stop wasting money on beer when you don’t have water at home.” Before I could even thank her she was already making her way out through the back door with two bags full of trash.

“So tell me more, what idea did this genius mind of yours had.” Luca was now facing me with thrilled expressions.

“I don’t know Luca, I need time to gather my thoughts and come up with the design of the machine, its mechanism and everything. But even I do come up with everything, how are we going to build it?” I was getting hit by the reality now, the cost for the parts of the machine how were they going to get covered?

“What ship do you take home after your classes?” Luca asked as he sipped onto his scotch still deep in his thoughts.

“The 3:00 PM one. Why?” My mind was still fogged with the uncertainties. Is it really possible?

“You should focus on figuring out how to make this device, while I’ll think about the ways to make it happen till tomorrow and come up with a plan and everything.” He seemed more determined than I was. Maybe we could make a difference for our people.

I tossed and turned in my bed all night as my head churned with ideas, rejecting them one by one. Finally, I gave up on sleep, turned on the light on my table, sat in the chair, and started writing down everything that popped into my mind. There were numerous possibilities, but I had to choose the most efficient and cost-effective one due to our limited resources. Could we really accomplish this with just the two of us, relying on our modest paychecks and limited knowledge?

I could pay attention to my lectures; neither could I shut my mind off. I had to come up with something before meeting Luca. I was still scribbling on my notebook, crossing off every idea I had thought of now. I looked up from my desk to the projector ahead; Professor Bianchi was taking our class for thermodynamics. She was one of the most inspirational people I had ever come across; she was known for her inventions for the betterment of the humankind. I cleared my head and pushed out all the thoughts because I didn’t want to miss her lecture.

“So, a phase change is physical transformations that a substance undergoes as it transitions from one state of matter to another.” That’s it! Exactly like they show in the cartoons, the light bulb of my mind lit up. Thank you Dr. Bianchi. I thought to myself, making sure I didn’t say it out loud.

I rushed to the library after the lecture and started searching online for any information that could help me gain more insight on how to build a device that could save my people’s pockets from getting robbed for the sake of clean water.

After searching for the relevant keywords and a few clicks, I came across the Watermaker (SDGC – Solar Desalination Geoassisted Continuous) . I read through the whole patent and it was perfect. Something that we needed, something we could make and something that could solve this problem once and for all. I couldn’t contain my excitement and wanted to show it to Luca as early as possible.

I printed out the information, read through the description and claims for the Watermaker (SDGC) and studied its mechanism deeply. There were several figures which showed all the parts that were used for the device. I scribbled my own notes on the paper alongside the black

printer ink. I could already imagine myself putting one part at a time to make this device.

Chapter 2:

I had a big smile on my face as I walked towards the shore to catch the ship back to the island. I was intoxicated with excitement. The last time I was this thrilled was 3 years back on my first day of the University.

“Giuseppe!” I hear Luca’s voice calling me from behind. I stopped and turned around waiting for him to catch up. We walked together onto the ship and sat down.

“Luca, I’ve finally came up with an initial plan for us to work on!” Brimming with excitement, I reached for my backpack's zipper and took out the printed patent along with my own notes. I flipped to the final page where I had hand drawn a rough layout for a device and flow chart which explained its mechanism. “So, I was finding a way which would cost us less bucks and would still be effective. Reverse Osmosis, Electrodialysis and all the other ways were going to cost us a fortune with the cost of the machine parts and the operating it too.” Luca meticulously examined my somewhat amateurish rendition of the device layout.

I patiently waited for his reaction as he took one look at the page and quickly flipped through the whole document. He immersed himself in his own thoughts.

“Giuseppe, I want to go with reverse osmosis. It seems to be less of a manufacturing cost. I don’t think you understand it well.” Luca straight up neglected my idea.

“At least consider it. You didn’t even consider it for once.” My tone was getting agitated.

“You’re acting like a child, I get that you’re still in 3rd year. Don’t think that you know better.” Luca was still ignoring the possibility that I could come up with something better than him. Of course I had considered the manufacturing cost including the operating cost too.

“Did you even read what is written in there? Are you rejecting it just because it is my idea?” My pitch got unconsciously higher than I expected it to be.

“Reverse Osmosis is also your idea but I stayed up all night to come up with a plan how could be pursue and make a device using reverse osmosis. I have it all planned. I don’t want you to ruin it!” Luca matched my tone, making sure to glorify his all nighter that he had pulled.

“Oh you think you’re the only one who stayed up all night? I did too. But I didn’t just keep my mind stuck to one possibility. I crossed out each and every possibility to find the best option for us. Are you going to pay for the operating cost of a reverse osmosis device? Who’s going

to pay for the fuel?” By the time I finished stating my point, I was out of breath.

Luca didn't bother to answer to my argument and stayed quiet. His gaze was stuck far ahead on the glistening water surface.

The rest of the ride to the island was quiet. We both didn't talk to one another. I guess this was it, our short lived ambition to do something for our community.

“At least take it with you and consider reading it once.” I handed Luca the document before getting off of the ship and walking towards my home.

Sleep seemed elusive to me tonight. I was concerned that Luca and I might not be on the same page. Allowing our egos to interfere with our community's well-being isn't the way to go; we need to collaborate to bring the change we were aiming for.

I decided to revisit the topic of reverse osmosis, especially since Luca was emphasizing it. As I delved into the mechanisms of devices I found online, that employed the same concept. I discovered a common drawback: all of them required the use of fossil fuels to operate. But that was the core motivation behind our venture. We aimed to

offer our community a water supply solution that wouldn't burden them with expenses.

Without even realizing I was again looking at the patent for the Watermaker (SDGC) on my laptop screen, reading the document again and again. Each time I was surer that this device just had everything that we needed. I hope Luca realizes it too.

'Please go through it, at least once.' I sent a text to Luca, making one final attempt to persuade him before giving in to sleep.

My body felt drained the next morning when I woke up. Thank God it was a weekend or I would've had to miss lectures. I grabbed a new T-shirt from the closet, it was stiff from the salt residue and I could see its color fading. It was one of my rough ones that were now at the mercy of sea water every time that it was washed. Lack of water for drinking was not the only problem we had to face.

I went out for a stroll in the neighborhood after having my breakfast. The breeze was colder than yesterday, winter was near. I took a deep breath and could almost taste the salt in the air, or maybe it was just my T-shirt. My gaze landed upon Mr. Mianci's hardware shop across the street, he is the one who has been arranging the material and parts for all of my university projects. I crossed the street

and entered his shop only to find Luca already sitting there with the document I gave him yesterday. He and Mr. Mianci were in a deep discussion. I cleared my throat to announce my presence. Luca met my eyes for a few seconds before lowering his gaze to the floor.

“Come on boy, take a seat.” Mr. Mianci gestured towards an empty seat beside Luca.

I quietly sat down and saw Luca shaking his leg.

“I’m sorry Giuseppe.” Luca took a deep breath before putting these words out there. “I should have at least gone through it before rejecting your idea.”

“It’s fine, all we want is to do well and help our community and I see you’ve come around to understand now why I was adamant on this device.” I patted Luca’s back with a big smile on my face.

“This is fantastic Giuseppe. How dumb of me! You are a genius! We can use renewable resources for it. The sea is going to give us water and the energy to operate this device. I was worried about the operating cost too that our people would’ve had to afford.” Excitement was pouring out in his pitch as well as from his smile that was almost touching his ears. “I’ve arranged some money for it too.”

He took out his wallet and showed me a cheque for \$15000 named to him.

“Where did you get this much money from?” My eyes almost protruded out of my head as I counted the zeros on that piece of paper.

“I sold my car yesterday.” Luca sighed as he folded the cheque to put it in his wallet safely.

“No Luca, you shouldn’t have. Your parents and you saved up all these years to buy yourselves that car.” I couldn’t believe my ears. The whole island knew how Luca and his father had worked hard for years to finally get a car for themselves, since both of them were the famous gear-heads of our island. How could he sell something that was so precious to them?

“Its fine, we didn’t get to drive it around much anyway. The money could be used for everyone’s good now. My father didn’t even hesitate when I told him why I needed the money.” Luca had a genuine smile on his face as if he had no regrets for what he did. “But my friend, I was just discussing it with Mr. Mianci. You have come up with such a great idea that I doubt we’ll have to spend even half of it.”

“Really? The heating system can consume a hefty amount, since we need a good insulation too for the tank.” Honestly, this was the most economical way I could think of; nevertheless it remained beyond our financial means.

“Don’t worry; Mr. Mianci is great friends with his supplier, who’s going to hook us up with good but affordable used parts.” Luca gazed ahead, his eyes fixated on the figure on the document which showed the device that we were going to build. “The Watermaker (SDGC) . I like it.” Luca whispered softly.

For the next few weeks Luca and I were stuck in my garage from evening till midnight to assemble The Watermaker (SDGC) . Mr. Mianci had arranged good quality machine parts to work with. We had a big tank, which had a good capacity to supply the island. The loading pipe was of excellent quality and of appropriate gauge to maintain the effective water level. I could see the device coming together within a month now, only if we manage to get our hands on fine quality heat exchangers. After that we could run some tests on it and check the quality of the water.

“Maria, beers for us please.” I casually asked while entering the bar with Luca. We used to go there frequently to discuss how we could improve the Watermaker (SDGC) and how we could make it better over some drinks before

heading to my garage to work on what we had just discussed.

Luca and I were engaged in a discussion about which material would offer the most effective and budget-friendly insulation for our tank. We were as boisterous as ever, but this time Maria had shushed us three times already to quiet down. It was unlike her usual self; she used to actively contribute her own ideas to our discussions.

“Boys please keep it down. He is the driver for the DrinkUp.” She gestured her head towards a man sitting on my left digging into his plate of fries and hamburger.

“So what?” I was confused, why should we care about him listening to our conversation?

“Do you think DrinkUp is going to just let go off of all the bucks they get from this island so easily?” Maria whispered lightly for us to hear.

She did have a point but what could they do? We’re making this device on our own and with our own money. Maybe she was just being paranoid.

We had decided on our material for insulation finally, Luca was going to place an order for it with Mr. Mianci

tomorrow. We were finally getting close to achieving our goal.

Chapter 3:

Just like any other day, Luca and I disembarked from the ship and headed straight to the bar together. Upon seeing the 'Closed' sign, Luca and I exchanged perplexed and apprehensive glances.

I felt my phone vibrate in the back of my pocket. I hastily retrieved it and saw Maria's name flash on my screen.

"Yes, Maria, wher—"

"Giuseppe, your garage!"

I couldn't finish my sentence as Maria's frantic voice interrupted me.

Without wasting even a second I ran towards my house, I heard Luca calling my name from behind as he ran after me.

My eyes instantly filled with tears, I couldn't catch my breath as something inside my chest clenched at the sight of my garage being a wreck. I didn't even realize I was already on my knees struggling to breathe. Maria, my mom and dad were going through the shambles and picking out the pieces they thought were still useful.

I felt Luca kneeling beside me, his own eyes welling up with anger and sorrow, a stream of tears tracing down his cheeks. His mouth hung open in sheer shock.

Both of us knelt there for some time, in quietness letting our emotions get the best of us.

“It’s okay boys, you can always make one again and better. Let’s consider this one for practice purposes.” My dad walked up to us and helped us both to our feet.

“Who did this?” I tried not to let my voice shiver as I let my vocal cords finally make some sound.

“I don’t know, I was taking a shower when I heard loud noises. I managed to come out of the house within 5 minutes and saw a bunch of people driving away in a black van.” My mother was alone at home.

“Are you okay mom?” I wrapped my arms around my mother in concern.

“I asked around, they took the ship back to the city.” Maria joined us; she had our loading pipe in her hands or what was left of it.

We all spent our rest of the day clearing out the wreckage. Only some of the parts were reusable, most of them were damaged badly.

“What did the authorities say?” Maria asked us while pouring us our scotches. It was 9 PM and we had just come back after filing a report.

“Nothing much, we had no names to give to them to investigate the incident.” Luca replied with a sigh.

“So you are the ones who were making that excuse for a device?” Our eyes followed the sound coming all the way from the other side of the bar. A man in a well tailored and fitted grey suit with his hair gelled back was sitting with two more guys in black. Only he had a glass of scotch right in front of him. The others were just staring down at the table.

“Yes, why does it concern you? You don’t look from around here.” I was getting agitated by his remark. One his sideman got up and handed over his business card to me.

I couldn’t help but frown as I read the business card. ‘Marco Santoro. CEO DrinkUp’. I passed the card to Luca for him to read. Both of us had our forehead crinkled and our fists closed, trying our best to contain the anger within us that was boiling our blood.

“As you can see it very much concerns me. I hope you boys would focus more on your studies and jobs, leave the

water supply to us now.” He got up and straightened his jacket before heading out.

“It was him.” Maria said as they closed the door behind them.

“Yes Maria, but we don’t have any proof.” I retorted, and downed the liquor, allowing it to sear my throat for a brief moment.

“Giuseppe, we’re up against this guy, who might even have strings he could pull up in the authorities too. He is going to shatter our hard work every single time. We might as well just give up now.” I could sense the vulnerability clearly in his voice.

“We just have to not let anyone know about the Watermaker (SDGC) until it’s done and ready.” Maria said as she was wiping off the counter.

“Yes, we can’t give up now Luca. It was almost ready.” I tried to put some strength and enthusiasm in my words but I doubt that it was enough for Luca.

“Yes, use my basement if you want. Not a soul would know about it.”

“You have a basement?” Luca looked at her with utter shock, this fact was unknown by us.

“Yes and a big one.” Maria laughed at both of our expressions.

We trailed behind Maria, passing the counter and entering her home. Inside her living room, she unveiled an almost concealed door beneath the rug. A steep flight of stairs beckoned, and we descended after 3 steps I heard Maria flip a switch which was on the wall to our right. The basement lit up revealing crates of beer, shelves decorated with wines, several small fridges which had more alcohol in them. There was a small couch and a coffee table right in the middle of it.

“Bring your engineering tools or whatever and start working again from tomorrow; I want to gulp down that water till I drop dead from my stomach bursting.” Maria handed us a key to her house.

We were again bursting with enthusiasm within a day, coming straight from the city to the basement and worked till our bodies gave up. This time everything was coming together faster and better since we had done it all before.

“Mr. Mianci, please ask your supplier to try his best.” Luca and I were earnestly appealing to Mr. Mianci.

Unfortunately, our enthusiasm was short-lived as we found ourselves stuck once again. It had been more than a

week, and everything had come to a halt as we struggled to obtain properly functioning heat exchangers. Either they didn't meet our standards or they were too expensive for us to afford. Given our budget constraints following the wreckage, we had to repurchase most of the parts.

"I'm sorry, boys. I've reached out to every supplier I've known throughout my years of running this shop," he said with a hint of demotivation. The warm, toothy smile he always greeted us with had vanished.

After hearing a 'no' from Mr. Mianci, again. We walked towards the deck to catch the ship to the city, I for my lecture and Luca for his work. We both kept quiet. The whole ride was filled with awkward but sad silence. What are we going to do now?

I made my way into my class. Dr. Bianchi was again delivering her lecture but my mind was too fogged with all the thoughts to focus on it.

"Giuseppe, could you come to my office after your lectures?" Dr. Bianchi said as the lecture concluded, and she began gathering her belongings to leave.

"Su- sure, Professor Bianchi." I replied hesitantly as she left the lecture room.

I knew I was in trouble since university and classes have been the last thing on my mind these past few months.

Chapter 4:

“Yes, come in.” I grabbed the handle of the door to push as Dr. Bianchi replied to my knock at the office.

I walked in with my eyes glued to the ground.

“Where are your thoughts these days during the lecture Giuseppe? And your latest assessments were not exactly up to the mark as they used to be, is something going on?” I knew this was going to happen one way or another. From the last few months I have been so indulged and busy with the Watermaker (SDGC), I didn’t have time to study for the assessments. During the lectures I’m constantly thinking of ways to make it better than before.

“Professor, actually I-“ I stopped in between my sentence. I was not sure how and what to tell her.

“Giuseppe, you’ve been an exemplary student all these years. If there is something going on that I can help you with, I will gladly.” Professor Bianchi was genuinely worried.

“Actually Professor, the thing is. I was kind of in-between inventing a device with the help of a friend.” I decided to carefully thread my word into a sentence somehow.

“Interesting.” Dr. Bianchi pushed her glasses up her nose, expecting me to give her further details.

I provided her with a brief overview of the Watermaker (SDGC) , explaining how we had almost successfully built a cost-effective device that relies on natural and renewable resources to operate but couldn’t find the heat exchangers to achieve what we wanted. I also mentioned the challenges we were currently encountering with Marco, the CEO of DrinkUp, regarding the protection of the device.

“First of all Giuseppe, I’m glad and proud of you and your friend are willing to go above and beyond for you community. This can actually motivate people from other communities to help themselves too. Secondly, if you had told me about it earlier I would’ve helped you in so many ways through my contacts to get even better parts for your device.” Dr. Bianchi expressed her enthusiasm, mirroring the excitement that Luca and I felt when we initially conceived the idea for the Watermaker (SDGC) . Dr. Bianchi stood up from her chair, gestured me to sit on a couch which was in the middle of her office with a coffee table at front. She started walking to and fro behind her chair and was drowned in her thoughts.

I immediately texted Luca and asked him to join us in Dr. Bianchi’s office. He had been carrying around the layout

for our device to look for the heat exchangers in the city himself, along with the pictures and he videos he took to document our progress. This helped Dr. Bianchi to closely analyze our partially built device and provided us her expert opinion.

“You have done good job boys. Here’s what we’re going to do. I’m going to arrange the heat exchangers and a remineralization device to make the water drinkable. Also some funds for setting up CCTV cameras where this device is going to be installed. We’ll deal with this Marco too.” Luca and I were both speechless. I thanked Dr. Bianchi with words for now but later I will thank her with my actions someday.

Luca and I walked out of the office together. We glanced at eachother with a smile; we could finally see a beam of light.

Dr. Bianchi had arranged perfectly new heat exchangers for us with a remineralization device. The device was finally coming together and our hearts were filled with joy and relief as we got closer to achieving our goal everyday while still working in Maria’s basement. We were soon in our testing phase; Luca was testing the water for its quality. Whether it was good enough to drink or not. With

a few tweaks to the heating system we were able to make perfectly healthy drinkable water, which had no impurities; it was desalinized, remineralized and had perfect pH.

“Here.” We slid a glass of The Watermaker (SDGC) water towards Maria on the same counter where she has been sliding us our liquor all these years.

Her eyes went back and forth between us and the glass as she smiled from ear to ear. She grabbed the glass and gulped down the water in one shot.

“This was the tastiest water I’ve ever had.” She wiped her lips after drowning the whole glass.

“You do know water is tasteless right?” I replied her with a teasing tone. We had done it. It worked, The Watermaker (SDGC) .

“Guys, if we put it out in the open, what are the chances that Marco guy wouldn’t destroy The Watermaker (SDGC) again?” Deep down we all had this concern but it was Maria who voiced it for us.

“I’m going to the station tomorrow to file a complaint, this time I’ll make sure to put Marco’s name on it.” Luca tried to assure Maria so she didn’t have to worry.

“Yes and Dr. Bianchi did give us money to install CCTV’s. We just need to find and appropriate location to install the device.” After hearing my words Maria started to immerse herself in her thoughts.

“I think, it would be best to install it near the decks, people are always there either waiting, getting on or off the ship to go to the city.” Maria finally turned her thoughts into words.

How does Maria always come up with such great ideas? I guess our minds are just made to do the technical work not to find the obvious solutions to a simple problem.

The very next day CCTV’s were installed at our selected location along with the Watermaker (SDGC) , everyone on the island had gathered to give us a helping hand and to celebrate. There was a red ribbon to cut, balloons for the décor and flowers for our chief guest and the biggest support.

I saw Dr. Bianchi getting off of the ship. With a warm smile she made her way towards us. The people of our island were so grateful to her and it showed in the way they welcomed her. My mother handed her the bouquet of flower which she accepted respectfully. As she made her way through the crowd in front of the Watermaker

(SDGC) , she gave the device a long, heartfelt glance before turning around to face the crowd.

“I’m so proud and thankful that I had the opportunity to be able to teach and work with someone like Giuseppe. He had always surprised me with his skills, passion and that great mind of his. Both he and his friend Luca have portrayed immense courage to come together and build a solution for their suffering community from the scratch on their own. This is going to be an example for a lot of my students to do better for their people, for their world. I hope both of them never lose their spirit and good in their hearts.” Dr. Bianchi had poured her heart out in front of the whole island; I could see slight wetness in her eyes behind her glasses.

I handed Dr. Bianchi the scissors to do the honors, she cut the red ribbon, and the device was turned on followed by a wave of loud cheer and claps from the crowd.

We had done it, after a long and hectic journey full of barriers. Luca and I have made water, a basic necessity, readily available to our people through the Watermaker (SDGC) .

Luca and I shared a hug, we both knew that this is just a start; we have to make this useable and drinkable water

available in the taps of each and every home on this island.
But we have to take one step at a time.

Watermaker to SDG 6.1

Water is the essence of life; it quenches our thirst, nurtures our crops, supports our industries and shapes our environment. Yet, according to the United Nations, over 2 billion people worldwide still lack reliable access to this vital resource, facing innumerable challenges related to water scarcity, contamination and inequity. Approximately 4.5 billion lack access to adequate sanitation. These staggering figures underscore the necessity of addressing the problem of water scarcity. Availability of clean and healthy water for drinking is a basic necessity and one of the fundamental rights of human being. Sustainable Development Goal (SDG) 6.1 proposed by the United Nations focuses on ensuring universal access to safe and affordable drinking water for all.

Water scarcity is one of the major challenges of our time. It knows no borders and affects countries and communities on every continent. Its consequences extend far beyond what individuals immediately desire. The global water crisis touches on issues of public health, economic well-being, environmental sustainability, and social justice.

Multiple problems contribute to being a hurdle in achieving SDG 6.1.

Problem 1: Uneven Access.

The first major challenge to achieving SDG 6.1 is severe and persistent disparities in access to safe water. Cities in developed countries generally boast reliable water supply systems, but rural and marginalized communities around the world struggle to access this basic need and remote villages and informal settlements in the shadow of urban skyscrapers grapple with the daily challenge of procuring clean water. Journey to get one day worth of water supply for their homes, often requires long treks in remote areas, leaving little time for education, income-generating activities or community development. This huge disparity between urban and rural areas as well as within countries is not only problematic; it is a strong picture of a global anomaly covering the source water.

Problem 2: Health Impact.

The second problem, and perhaps the most insidious, is the devastating health consequences of inadequate access to safe water. Contaminated water is a breeding ground for multiple waterborne diseases such as cholera, dysentery and typhoid. Sadly, it causes millions of preventable

deaths every year, and children bear the brunt. The burden of waterborne diseases is particularly high in developing regions, further exacerbating existing health disparities. Lack of availability of water increases the cases of death due to heat stroke and dehydration. Crops need clean irrigation water to nurture as well, thus resulting in less availability of food in these remote areas and malnutrition in children as well as the adults. Inadequate sanitation facilities also links to the lack of availability of clean water which further contributes to the spread of disease and environmental pollution. Open defecation remains a common practice in many regions which causes numerous health hazards and contaminates the existing water bodies. There is a need for improving sanitation infrastructure to ensure safe disposal. It's a vicious cycle – lack of clean water causes disease, which in turn perpetuates poverty and reduces overall quality of life.

Problem 3: Economic.

The third issue is the financial burden brought about by water scarcity and low water quality in affected territories. When people must commit substantial amounts of time

and energy to locate water from far away sources, their aptitude to participate in business-creation ventures is heavily hampered and so is their drive towards gaining education to pursue a career since they are too busy to vend for the basic necessities. This leads these communities into a vicious poverty cycle that is challenging to escape from. With restricted access to clean water, communities are not able to invest in education, economic growth, or structure developments that might liberate them from poverty. It is a test that sustains underdevelopment and obstructs progress in various aspects.

Problem 4: Environmental Impact.

The fourth problem is the profound environmental impact of water shortage. Continuous over-extraction of water from natural resources ends up in the depletion of aquifers, the drying up of rivers and wetlands, and the disruption of ecosystems that rely on these water bodies. This over extraction of groundwater for agriculture, industry and domestic use can cause land subsidence, saltwater intrusion in coastal regions and long term damage to the

sustainability of water resources. Pollution from industrial effluents, agricultural runoff and improper disposal of waste in the water bodies, harming the aquatic ecosystems, lowering biodiversity, and impairing overall water's quality. The results ripple through the surroundings, affecting not only aquatic lifestyles but additionally the fitness and livelihoods of communities that depend upon these ecosystems.

Problem 5: Climate Change.

The fifth problem is the influence of climate change, which compounds the global water crisis. The global warming causing overall higher temperatures around the world, resulting in altered precipitation patterns, prolonged droughts and increased evaporation rates, all of which disrupts the availability of freshwater resources. Regions which already have scarce availability of clean water find their challenges amplified. This climate- change induced water scarcity adds up n the existing problems, making it even more difficult to meet the growing demand for clean water, particularly in regions already struggling. Thus,

climate change makes the road towards SDG 6.1 a lot thornier.

Acknowledging the severity of global water issues, the United Nations created SDG 6.1 as a ray of hope. This particular goal serves as an incentive for nations, organizations and individuals to collaborate in order to confront water scarcity in an extensive and equitable way. The Sustainable Development Goals (SDGs), in its entirety, denotes an international summons to take action, understanding that the interweavenet of global problems effecting general population all over the world heavily requires an integrated and inclusive response.

Problem 6: Lack of Awareness.

Awareness and education about water conservation and hygiene practice is important especially in the underserved communities. Wastage of water is an alarming concern in the communities where they already lack the access to clean water. Mismanagement of water resources, including agricultural practices and unsustainable water use contributes to water scarcity. Strategies for sustainable water management, including efficient irrigation

techniques and conservation measures should be taught to the small scale farmers and the residents of the remote areas to further improve their lifestyle.

Addressing these complicated problems requires a coordinated and multi-stakeholder approach, involving governments, international organizations, non-governmental organizations, local communities, and the private sector. Solutions must focus on improving access to clean water, enhancing water quality, implementing sustainable water management practices, and raising awareness about water-related issues. Achieving SDG 6.1 is not only a matter of ensuring a basic human right but also a critical step toward improving public health, reducing poverty, and fostering sustainable development worldwide. It holds paramount importance in this scenario. Its simple yet deep mission is to see to it that all of the individuals around the globe have access to clean and inexpensive drinking water by 2030. This aim covers not only access, but also affordability, safety, and sustainability. Achieving this target would be a huge advance in mankind's welfare. SDG 6.1 encapsulates the pledge of the international community to comprehensively handle water scarcity, equitably, and sustainably.

While we face such immense global challenges and the crucial need for SDG 6.1 fulfillment, innovative solutions

are not just desirable but essential also. Here enters the Watermaker (SDGC – Solar Desalination Geoassisted Continuous), a technological phenomenon with sustainable desalinization of water that has the potential to redefine our relationship with water, around the world. The Watermaker (SDGC) can be aligned with SDG 6.1; it has potential to be a transformative solution in addressing the global water scarcity crisis.

The heart of this device is the tank filled with the water that needs to be desalinized. The tank is designed to be waterproof and thermally insulated to ensure its efficiency. Near the surface of the water in the tank is the first heat exchanger. This exchanger heats the water, causing it to evaporate, just like a boiling pot of water on your stove but on a larger scale. As the temperature of the water near the surface increases it turns into steam. The steam rises and mixes with the air above the water surface. Here comes something interesting, the steam comes in contact with the metal sheets above the water's surface which resembles a fan. These sheets serve as cooling means. When the steam meets these cooled metal sheets, it condenses and transform back into liquid water droplets. The freshly condensed and desalinized water droplets are collected in a reservoir. This water is ready to be used butresalinization would be required to make it drinkable. To keep the water level consistent and ensure a continuous

supply, the device uses third loading pipe that continuously feeds the tank with water to desalinate.

The Watermaker (SDGC) 's biggest strength is using renewable energy sources like solar and geothermal power. This means it can use the sun's heat from the Earth's core to operate while reducing the need for fossil fuels. Inside the tank, the metal sheets are placed in two 'fans', one above and one below. They are in the heat exchange connection with each other ensuring the efficiency of transfer of heat. Thermal gradient is created within the water tank by these sheets and the water, which plays a vital role in effective heat transfer. Convective motion occurs in both steam and the water. These are circular currents that help to distribute heat evenly. The fifth exchanger along the side walls are installed to cool the water, which further enhances convective motion. This cooling helps to maintain a counter current flow thus increasing the rate of evaporation.

The Watermaker (SDGC) is more than just a device; it is a major breakthrough in the water generation technology. It is a beacon of hope for the world struggling with multifactor challenges of water scarcity and water quality. This device promises the provision of clean, safe drinking water while keeping in check that building this device, operating it for a long time is affordable for the concerning

underserved communities. It could be our reliable frontline soldier in this raging war against scarcity of water and to achieve the SDG 6.1, ensuring universal access to this fundamental human right.

The cost effectiveness makes the Watermaker (SDGC) standout of the all the other water generation technologies. This device is carefully designed to be affordable to manufacture, which makes it accessible to the communities and regions with limited financial resources. The efficient mechanism along with the use of locally available materials makes sure that the Watermaker (SDGC) doesn't remain just another concept on the paper. Watermaker (SDGC) is a practical and viable solution for the suffering communities. This factor of availability is in perfect harmony with SDG 6.1 objective's to provide affordable water solution particularly to the underserved regions.

This remarkable device harnesses the power of renewable energy resources, such as solar, wind or waves to generate clean water. It's reliance on natural and renewable resources to operate doesn't deplete existing water sources or rely on fossil fuels, successfully not contributing to further pollution and scarcity of water. By utilizing only the renewable resources the Watermaker (SDGC) promotes sustainability and reduces further

operating cost for the device, this aligns with the SDG 6.1's objective of managing water resources sustainably and cost-effectively. This device undeniably bears significant implications by expanding the access of safe drinking water to a broader population. Its efficient and easy mechanism ensures a continuous supply of uncontaminated water, reducing the reliance of the population on the nearby unsafe water sources. This nullifies the hurdle of inconsistent access to water supply systems on our journey to achieving Sustainable Development Goal 6.1.

The Watermaker (SDGC) plays a pivotal role in addressing the issue of mitigation of water contamination by providing a dependable source of clean water. It reduces the risks associated with waterborne diseases because of its mechanism being evaporation and sublimation. Beyond its technical brilliance, the Watermaker (SDGC) holds the potential to empower local communities to take the ownership of their water supply. Its cost-effectiveness and reliance on natural resources makes community-led initiatives in sustainable water management possible. It encourages the local involvement by reducing the dependency on centralized systems. Harmonizing with the fundamental principle of Sustainable Development Goal 6.1; empowering

communities and ensuring their participation in water resource management.

To echo with the environmental objectives of Sustainable Development Goal 6.1, it ensures the sustainability of water resources and safeguards the natural environment by reducing the need to extract water from already stressed sources. It supports the conservation of water-related ecosystems and habitats. This not only helps to protect aquatic biodiversity but also safeguards the integrity of the water bodies that countless communities rely upon.

While we are facing challenges due to climate change, the Watermaker (SDGC) stands as a resilient solution with its ability to operate using renewable energy sources which makes it less vulnerable to climate-induced water scarcity. It provides the underdeveloped regions with climate-adaptive solution, aligning with the goal of SDG 6.1. It ensures the continuous supply of clean water even in changing climatic conditions.

The impact of the Watermaker (SDGC) extends beyond the immediate benefits of increased accessibility to clean water. It lays down a broader spectrum of contribution to achieving Sustainable Development Goal 6.1. The reduction in waterborne diseases and related illnesses, increased cultivation of crops and fewer cases of dehydration, heat strokes and malnutrition directly leads to

improved health outcomes in the underdeveloped areas. Hence, the strain on the healthcare system is reduced in an already struggling region. The time saved from water-fetching duties can be utilized by the people towards their education, skill development and economic growth as access to clean water enables communities to engage in income- generating activities. As the girls of the family were assigned the duty of fetching the water most commonly, the Watermaker (SDGC) promotes gender equality by providing more opportunities for them to gain education after relieving them from their water- fetching duties.

The Watermaker (SDGC) enhances community resilience to climate change and water scarcity by providing a consistent source of clean water no matter the challenging conditions. As it uses renewable energy sources and reduces the water extraction which helps in conserving the natural resources and protect the ecosystem. This feature of the Watermaker (SDGC) alone tackles so many challenges in the region including pollution problem by not depending of fossil fuel, which ultimately raises the overall temperature of the area. Also cutting down the operating costs as it would not need frequent fuel ups or electricity supply to function. Thus, the Watermaker (SDGC) provides the perfect solution to tackle all the challenges in the remote are single handedly.

The introduction of Water maker has been a game changer in many regions already. In remote villages of Rajasthan, India known for their arid climate and limited access to clean water by harnessing solar energy, Watermaker (SDGC) s have been installed in these villages. They are providing a reliable source of clean water. Women who once spent hours fetching water from distant wells and water bodies now have more time to invest in income-generating activities and education. The incidence of waterborne diseases has significantly decreased and agricultural productivity has improved, benefiting both the health and economic well- being of these communities.

Similar improvements were seen in sub-Saharan Africa, where access to safe drinking water remains a critical concern. After the deployment of Watermaker (SDGC) in schools and healthcare facilities not only ensured that students have access to clean water throughout the school day but also improved overall sanitization and hygiene in these institutions. The impact on education is profound with increases attendance and performance due to reduced cases of waterborne illnesses. In healthcare facilities, the Watermaker (SDGC) ensures that medical staff provides clean water to the patients and maintain proper standards for hygiene, reducing the risks for overall hospital-acquired infections.

In coastal locations worldwide, the Watermaker (SDGC) has been usefully employed to take on the simultaneous issues of water scarcity and saline intrusion. In these areas, increasing ocean heights and saltwater entering unpolluted sources of water have menaced inhabitants' way of life. The Watermaker (SDGC) 's desalination ability has verified its worth in these regions. By turning the ocean's water into drinkable liquid, it has made sure access to uncontaminated drinking water and safeguarded the practicality of operating farms in maritime areas. This adaptation to local circumstances shows the versatility of the Watermaker (SDGC) in responding to water hardships consistent with the locale.

Many remote island communities around the world face significant challenges regarding their limited access to clean drinking water. Lack of freshwater sources and importing bottled water, makes availability of clean water scarce and expensive resource for the people living there. Deployment of Watermaker (SDGC) in such islands has been proven to be a game changer. Continuous supply of fresh drinking water is achieved from seawater by desalinizing through the Watermaker (SDGC) . Most of these the Watermaker (SDGC) s that are installed are powered by solar energy thus making them environmentally friendly and cost effective. Hence, the residents of these islands no longer need to rely on costly

and unsustainable water supply solution. There have been major improvements in living conditions and reduced economic burden on these communities after the continuous access to free clean water.

Indigenous communities in remote areas of Latin America often face water scarcity and limited access to essential services. The Watermaker (SDGC) has been introduced to address these challenges head on and empower these communities. In the Amazon rainforest region of Brazil, Watermaker (SDGC) s powered by solar energy have been deployed in indigenous villages. These systems purify water from nearby rivers and streams, providing a reliable source of clean water for drinking, cooking and sanitation. The initiative not only improves public health but also respects cultural and environmental values of the indigenous communities by reducing the need for river water extraction and preventing pollution.

Natural disasters such as earthquakes, hurricanes, tsunamis and floods results in the disruption of access to clean water which poses a significant threat to already underserved and struggling communities. The Watermaker (SDGC) 's mobility and rapid water generation capabilities have been proven to be an invaluable tool in the disaster relief efforts. This device can purify water from various sources including rivers and ponds making it safe for

consumption. Since the destruction of infrastructure also results in electricity power outage, the Watermaker (SDGC) compensates for it by providing continuous supply of water by utilizing the renewable energy sources. Along with providing relief to the affected population by supplying clean water, it also plays a major role in preventing the outbreak of waterborne disease that often happens after such natural disasters.

Refugee camps often face severe water scarcity challenges with limited access to water for drinking, cooking and hygienic purposes. The Watermaker (SDGC) can be utilized in these refugee camps worldwide to address these critical water needs. In sub-Saharan Africa, for example, Watermaker (SDGC) units are installed which are powered by solar energy to produce safe drinking water from local water sources. The burden of search and collection of water on women and girls have been alleviated who were responsible for making long distance water fetching jobs for their family. This device also keeps the waterborne diseases at bay in such vulnerable settings, since most of the water bodies are contaminated defenseless areas like these.

Water scarcity and high cost of transporting water to the mining operations in remote and arid region can be unfavorable for both the mining operations and the

surrounding environment. For instance, in mining communities in Australia's arid outback, Watermaker (SDGC) units are being used to acquire water from brackish groundwater source. They not only reduce the environmental impact of water extraction and as well as ensure the well-being of the mine workers by providing them clean water while taking off financial burden off of the project. This results in increase in productivity of the workers and such operations.

Many rural areas depend on their agricultural land to generate income for themselves, but water for irrigation can be limited in arid regions. The ability of Watermaker (SDGC) to generate clean water from alternative sources has been of a great support for small scale agriculture. By using solar energy and being cost effective, Watermaker (SDGC) converts brackish groundwater into usable irrigation water in the areas where small farmers rely on rain-fed agriculture. It helps in expanding agricultural opportunity and ensures food security for local residents further contributing to their economic development and reduction in poverty.

Addressing the global water scarcity crisis and achieving the universal safe and affordable availability of drinking water, as envisioned in Sustainable Development Goal 6.1, is a complex undertaking filled with multiple challenges

and considerations. Innovative water treatment technologies like the Watermaker (SDGC) sure hold immense promise but their successful installations and impact depends greatly on multiple issues.

Achieving scalability and ensuring adequate access has been one of the foremost challenges in deploying the Watermaker (SDGC) on a larger scale around the world. Scaling up the production, distribution and maintenance of these systems to reach the communities who are in need on a global scale has been a monumental logistical and financial challenge. This technology is effective at a small scale but transitioning to larger installations that serve entire communities or regions require careful planning, ample resources and the involvement of various stakeholders. Most of the regions facing severe water scarcity are remote, which lack adequate infrastructure and have limited financial resources

The initial cost of acquiring and installing any technology in these remote areas is a considerable barrier. The Watermaker (SDGC) is designed in a simple way, it requires less investment to build such device with easily available and less expensive local parts. For larger scale installation, Public-private partnerships with international aid programs can provide findings. The long term benefits

such as, improved health outcomes and increased economic productivity outweighs the initial investment.

Local conditions differ from region to region. There are varying levels of water contamination, mineral content and seasonal fluctuations in water availability. The cultural and local preferences regarding consumption of water should also be considered. The technology of the Watermaker (SDGC) can adjust to local needs sufficiently by consistent supply of water irrespective of difference in between the areas across the globe.

Many advanced water treatment technologies require a source of energy to operate effectively. This pose challenges in regions with unreliable or limited access to electricity and financially lack to fuel up the device continuously to get the water supply. In these off-grid areas, renewable energy sources should be utilized such as solar or wind power to ensure continuous operation and sustainable supply of water.

This device requires regular maintenance, including filter replacement, cleaning and periodic inspections to ensure the long-term sustainability of the device. In these economically challenged areas, ensuring the availability of the spare parts and trained technicians for maintenance is to be considered. Ensuring that marginalized and underserved areas have access to this technology by

overcoming geographical barriers and providing support to these communities to acquire, operate and maintain the Watermaker (SDGC) poses a significant hurdle. Community involvement in the maintenance is the key to the lasting sustainability. Empowering local communities to take responsibility of the device, providing them with proper training will encourage a sense of accountability for their upkeep and vital steps. On the other hand, this requires education and capacity-building efforts, which could be time consuming and need further resources.

Meeting the regulatory standards and ensuring the quality and safety of treated water is of utmost importance. Following the national and international water quality standards is essential. Rigorous quality assurance measures and ongoing monitoring is necessary to ensure that the treated water consistently meets the already established safety criteria. Providing training to local communities and operators is essential for effective maintenance and operation of the Watermaker (SDGC) . This includes educating users on the device's functionality, maintenance procedures and hygiene practices related to the storage of water and its consumption.

For achieving SDG 6.1 and to address the global water crisis broadly, a concentrated and constant effort is

required. Investments for water infrastructure must be prioritized by the Governments and international organizations to ensure that communities have access to reliable and safe water source. Continued research and developmental efforts are required to continuously enhance the efficiency, affordability and sustainability of water treatment technologies like the Watermaker (SDGC) . Empowering local communities where Watermaker (SDGC) is going to be installed is necessary to take the ownership of water resources and participate in decision making processes which are important to ensure sustainability of water initiatives. Awareness and education about the importance of water conservation, hygiene practices and reliable water management is crucial for long term change in future.

Policymakers must enact and enforce regulations that protect water resources and promote equitable access and incentivize sustainable water use. Collaboration at the global level is essential to address across the boundaries water issues, promote sharing of knowledge and technology and mobilize water related projects. Diplomatic efforts and conflict resolution should be in place where there are escalating water related disputes.

As outlined in the priordiscussion the global water crisis represents one of the most dreadful challenges humanity

has to face in the 21st century. The problems associated with water scarcity are multifaceted, deeply intertwined and have extensive implications for human health, ecosystem, economic stability and social equity. As we find the way through the complexities this crisis, the pursuit of UN Sustainable Development Goal 6.1 takes center stage providing us with the universal aims to effectively tackle the crisis.

The problems linked to water scarcity mentioned in the previous sections, highlights the urgency of taking serious actions at the global scale. Access to clean water is not merely a matter of convenience; it is a fundamental human right. As the world's population increases, urbanization also increases forcing us to come face to face with the climatic changes and scarcity of not just water but other resources as well. The need for innovative and sustainable solutions has never been more critical.

As the world grapples with growing water scarcity, climate change and population growth, innovative solutions are of dire need. The Watermaker (SDGC) , introduced as a transformative technology offers a glimpse of hope in the journey to address these pressing challenges related to water. This very device can play a major role in achieving Sustainable Development Goal 6.1 because of its innovative mechanism.

The Watermaker (SDGC) 's mechanism tackles the challenges of contamination head on by removing wide range of contaminants, including pathogens, chemicals and pollutants. It ensures that the treated water meets and exceeds established standards. This results in less spread of waterborne diseases hence lowers the burden on the healthcare system. Sustainability is one of the most critical considerations in the pursuit of Sustainable Development Goal 6.1. The Watermaker (SDGC) ensures the sustainability and lowers the environmental impact by using renewable energy sources such as solar, wind and waves. This reduces the carbon footprint associated with water treatment and mitigates environmental impact, as well as provides a huge relief to the underserved communities economically as operating the device is affordable. It also minimizes the water wastage by efficiently using reject water or brine, ensuring that as much water as possible is treated and made available for use. As the Watermaker (SDGC) treats water from diverse resources it contributes to the preservation of existing water resources and reduces the need for unsustainable.

Achieving SDG 6.1 requires addressing water inequality and ensuring that vulnerable and marginalized communities have equitable access to clean water. The Watermaker (SDGC) empowers these communities by

providing them with reliable source of clean water. By reducing the physical and time burden associated with water collection, especially girls and women, the Watermaker (SDGC) enhances the opportunities for education and promotes economic empowerment and community development. With the readily available lean water for irrigation these communities can prosper their agricultural land and excel economically through it while also keeping the cases of malnutrition in their community at bay. The Watermaker (SDGC) 's rapid water generation capabilities make it an indispensable tool in disaster relief and humanitarian aid efforts. When natural disasters strike, access to clean water is often disrupted, posing severe threat to the affected population. The mobility and versatility allows the Watermaker (SDGC) to be deployed quickly and provide the emergency water for drinking and sanitization from the available sources.

Adaptability is a key factor in the Watermaker (SDGC) that plays a vital role in achieving Sustainable Development Goal 6.1. It can be customized and configured to suit various environmental conditions, making it suitable to work in a wide range on communities. Whether in remote rural communities, disaster stricken areas or densely populated urban centers the Watermaker (SDGC) can adapt to the specific water sources and other needs in the region. This flexibility

enhances its potential to provide clean water to those who need it most, regardless of location.

The Watermaker (SDGC) is not only a technological solution but it is also a symbol of innovation and hope for us. It shows what can be achieved when human skills are harnessed to confront global challenges. It promotes sustainable development by contributing to broader developments extending far beyond just the provision of water, it indirectly promotes communities empowerment economically and educationally.

In conclusion, the Watermaker (SDGC) 's potential to play a major role in solving Sustainable Development Goal 6.1 is grounded in its ability to provide safe and affordable drinking water, adapt to diverse environments, mitigate environmental impact, and empower vulnerable communities. AS our world faces growing scarcity challenges driven by climatic changes and population growth, its mechanism of sustainable and continuous desalination, powered by renewable energy sources holds immense importance and plausibility. Watermaker (SDGC) represents comprehensive approach to addressing the current water crisis, offering an over-all solution that surpasses mere desalination.

In a world where access to safe water remains a pressing issue, the Watermaker (SDGC) stands as a beacon of

hope. It's potential to make safe drinking water accessible. Regardless of location or circumstances of that region, reaffirms the power of innovation in driving progress towards a more promising future. This device exemplifies the innovation and commitment needed to address one of our most pressing challenges. It has potential to do a major contribution to SDG 6.1 which emphasizes the sustainable practices in building a more impartial and water-secure world, contributing to a world where basic human right to clean water is not just a goal but a reality for all.

SDG 6.1 what get by SDGC ?

(Solar Desalination Geoassisted Continuous)

Watermaker - SDGC toward SDGs/UN 6.1

(Target 6.1: By 2030, achieve universal and equitable access to safe and affordable drinking water for all).

Water Scarcity:

Water, the essence of life, flows through the very core of our existence, sustaining all living organisms and shaping the very landscapes we inhabit. It is the thread that weaves through ecosystems, the lifeblood of agriculture, the force behind industries, and the elixir that quenches our thirst. Yet, in the 21st century, we find ourselves standing at the precipice of a global water crisis of unprecedented proportions. The importance of water, once taken for granted, has now emerged as a defining issue of our times, a challenge that transcends borders, defies boundaries, and touches the very heart of human survival. Water scarcity, the gravest manifestation of this crisis, calls for urgent attention and concerted efforts to ensure the well-being of humanity and the health of our planet.

As the world grapples with a growing sense of urgency in addressing this crisis, it is imperative to recognize that water scarcity is not a distant problem for a distant future. It is here, now, and its consequences reverberate across the

globe, affecting people, ecosystems, economies, and societies. The true significance of water scarcity can only be understood by acknowledging its multi-dimensional nature, rooted in its fundamental role in supporting life and its complex web of causative factors.

Water is the lifeblood of our planet, a substance so fundamental that it underpins the very essence of existence. It is the cornerstone of ecosystems, the catalyst for growth in agriculture, the backbone of industry, and the most basic necessity for human life. The sheer ubiquity of water in our lives often obscures its critical importance, but a closer look at recent events and unfolding statistics reveals a disturbing truth – the world is facing a water crisis that threatens to compromise our future.

Picture this: in the heart of a bustling metropolis, citizens queue up for hours to access a meager supply of drinking water. Meanwhile, in rural communities, farmers watch helplessly as their crops wither under the relentless sun due to inadequate irrigation. Across continents,

ecosystems are being pushed to the brink, and the intricate balance of nature is tilting as aquatic habitats shrink, while industrial centers face unprecedented challenges in securing the resources needed for growth. These scenarios are not isolated incidents but symptomatic of a larger global crisis; water scarcity.

The alarming fact is that water scarcity is not just a crisis of far-flung arid regions; it is a problem that transcends borders and has become a defining issue of our times. As we advance into the 21st century, the urgency of addressing water scarcity cannot be overstated. The strains on water resources are felt in cities, towns, and villages across the globe, in the agriculture that feeds our growing population, and in the industries that fuel our economies. As the demand for water continues to surge due to population growth, urbanization, and industrial expansion, the world is confronted with a stark reality – the life-sustaining resource that we have long taken for granted is at risk of depletion.

Water is an indispensable and irreplaceable resource, with its significance echoing through every aspect of life on Earth. It is not merely a substance that quenches our thirst; it is the medium that sustains life itself. Ecosystems, from the depths of the oceans to the peaks of mountains, rely on water to thrive. As a climate regulator, water plays a pivotal role in shaping the environment, influencing weather patterns, and sculpting landscapes. Its importance is further underscored by its pivotal role in driving agriculture, powering industries, and providing for domestic consumption.

Agriculture, the foundation of human civilization, draws heavily on water resources. From crop irrigation to livestock maintenance, water is the linchpin that ensures food production and security. The industrial sector, the backbone of modern society, relies on water for processes, cooling systems, and energy production. In our homes and communities, it is water that ensures our health and well-being, serving as a critical component of hygiene, sanitation, and daily life. Its role in public health is

undeniable, as access to clean and safe drinking water is a fundamental human right.

However, the significance of water transcends these immediate applications and extends to global well-being. When water becomes scarce or contaminated, a ripple effect ensues, touching every facet of society. The shortage of clean and safe water sources perpetuates a cycle of poverty, as inadequate access to water hinders economic growth, limits educational opportunities, and exacerbates public health issues. It leads to food insecurity, as agriculture struggles to produce enough to sustain a growing population. The implications extend to political stability, as conflicts emerge over water resources. In an era of rapid urbanization, cities find their development challenged by water scarcity, complicating the provision of essential services and the maintenance of infrastructure. The collective and far-reaching consequences of water scarcity underscore its significance as a global concern.

Water scarcity, in essence, refers to the insufficient availability of freshwater resources to meet the needs of a particular region or population. This scarcity can manifest in quantitative terms, reflecting a shortage of water quantity, or qualitatively, pointing to a deficit in water quality. The implications of water scarcity can be further exacerbated by seasonal fluctuations, climate change, and variations in geographic regions.

Water scarcity is not a singular issue but a multifaceted problem that encompasses both the quantity and quality of water.

- 1. Quantity:** When we discuss water scarcity in terms of quantity, we refer to a shortage of available freshwater resources relative to the demands of a population or region. This condition often arises from a combination of factors, such as increased water use due to population growth, inadequate infrastructure, and variations in seasonal supply. The presence of water scarcity does not mean that a region is entirely devoid of water but rather

that the existing supply is insufficient to meet the needs of the people.

2. **Quality:** In addition to quantity, the quality of available water resources is crucial. Water scarcity is further exacerbated when available water sources are contaminated or polluted to the extent that they become unsafe for consumption or use. This impairs the suitability of the available resources, diminishing the already limited supply.
3. Water scarcity is a complex challenge, the result of both natural and human-induced factors. While the natural factors include arid climatic conditions, unpredictable precipitation patterns, and the availability of renewable water resources, it is the human-induced factors that are increasingly driving the global water crisis.
4. **Population Growth:** The world's population is on an inexorable rise, projected to reach nearly ten billion by 2050. With more mouths to feed, more industries to power, and more communities to sustain, the demand for

water is skyrocketing. The burgeoning global population exerts immense pressure on available water resources.

- 5. Climate Change:** Climate change is no longer a future scenario; it is an ongoing reality with far-reaching consequences for water scarcity. The changing climate is causing shifts in precipitation patterns, leading to extended droughts in some regions and more intense rainfall in others. This unpredictability has severe consequences for water management and allocation. The melting of glaciers, often referred to as the "water towers of the world," is particularly concerning. These glacial systems provide a vital source of freshwater for many regions, and their accelerated retreat threatens to disrupt local water supply.
- 6. Over-Extraction:** Over-extraction of groundwater is a common practice for agricultural and industrial use. This practice leads to the depletion of aquifers faster than they can naturally recharge, rendering them unsustainable in the long run.
- 7. Pollution:** Pollution from industrial, agricultural, and domestic sources contaminates available water resources,

reducing their quality and rendering them unsafe for consumption. Pollutants range from chemical effluents in industrial areas to pesticides and fertilizers in agriculture to pathogens in urban and rural areas.

These interrelated causes create a complex web of challenges that pose a considerable threat to the availability and quality of water resources. The scale of this crisis is immense, affecting regions worldwide and impacting countless lives. It is a crisis that demands attention, understanding, and a global response.

The severity of water scarcity is not uniform across the globe; it varies significantly from one region to another, depending on a myriad of factors.

- **Africa:** Africa is one of the continents most profoundly affected by water scarcity. While this scarcity is not limited to specific countries, it extends across the entire continent. Countries in North Africa, such as Egypt and Sudan, are highly reliant on the Nile River, creating a delicate international situation regarding water

management. Sub-Saharan Africa faces water scarcity due to limited infrastructure, population growth, and the impacts of climate change. Africa's struggle with water scarcity intersects with broader issues such as poverty, food security, and public health.

- **Asia:** Asia, with over half of the world's population, faces significant water challenges. Rapid urbanization, particularly in countries like India and China, places immense pressure on water resources. The retreating glaciers in the Himalayas, which feed major rivers like the Ganges and Brahmaputra, pose a substantial concern. Parts of Western Asia, including the Middle East, experience severe water stress, with groundwater depletion and salinization of water sources creating substantial challenges.
- **North America:** Despite its relative wealth and resources, North America is not immune to water scarcity issues. The western United States, particularly in arid regions like California, Arizona, and Nevada, grapples with prolonged droughts, over-extraction of groundwater, and conflicts

over water allocation. Canada also faces water scarcity challenges, including the issue of access to clean water in Indigenous communities and the effects of climate change on the availability of freshwater resources.

- **Europe:** While Europe is generally recognized for its abundant water resources, regional disparities exist. Southern European countries like Spain and Italy face water stress due to population density, tourism, and agricultural demands. Climate change is contributing to shifts in precipitation patterns, potentially affecting water availability.
- **Oceania:** In Oceania, Pacific island nations face unique water scarcity challenges. Rising sea levels, driven by climate change, are infiltrating freshwater sources, rendering them undrinkable. These nations are also vulnerable to extreme weather events, which can disrupt water supply systems.

These regional snapshots illustrate the diversity of water scarcity challenges worldwide. While these are just examples, it's important to recognize that water scarcity is

a truly global concern, with variations influenced by local factors and vulnerabilities.

Water is not only a finite resource but also the core of life itself. Its scarcity is an issue that reverberates across the globe, affecting societies, economies, and ecosystems in profound ways. Understanding the multifaceted impacts of water scarcity is crucial to grasp the urgency of addressing this global challenge.

Socio-economic Impact:

- 1. Health and Sanitation:** Perhaps the most immediate and striking consequence of water scarcity is its impact on public health. Approximately 2.2 billion people around the world lack access to safely managed drinking water services, leading to waterborne diseases like cholera and dysentery. Insufficient sanitation facilities exacerbate this issue. Moreover, the burden of water collection, usually carried out by women and children, consumes time and energy that could be invested in education or income-generating activities.

- 2. Food Security:** Agriculture is a primary consumer of freshwater, accounting for around 70% of global water use. Water scarcity disrupts food production and can lead to reduced crop yields, livestock shortages, and food price spikes. This, in turn, affects global food security, amplifying the challenges of feeding an ever-growing population.
- 3. Economic Growth:** Industries, from manufacturing to energy production, rely heavily on water. Water shortages force companies to reduce production or even shut down. In some regions, the impact is palpable through reduced employment opportunities and lower incomes, further exacerbating poverty. The economic consequences of water scarcity extend to entire countries and industries, affecting national GDPs.
- 4. Migration and Displacement:** As water scarcity deepens, people are compelled to migrate from affected regions, often termed "water refugees." This phenomenon can lead to internal displacement or cross-border migration, sparking competition for resources and sometimes

triggering conflicts. The need for climate refugees to leave their homes due to droughts and resource scarcity is a growing concern in a changing climate.

5. **Social Inequalities:** Vulnerable populations, such as those in low-income urban areas and rural communities, bear the brunt of water scarcity's impact. The divide between those with access to clean water and those without deepens social inequalities. This often translates into differential health outcomes, education opportunities, and living conditions.

Environmental Impact:

1. **Ecosystem Degradation:** Water scarcity disrupts aquatic ecosystems, leading to habitat destruction and loss of biodiversity. This impacts not only aquatic life but also terrestrial species reliant on water sources. Fragile ecosystems like wetlands and riverside habitats suffer the most.
2. **Reduced Agricultural Productivity:** Agriculture depends heavily on water for irrigation. As water availability

decreases, soil quality degrades, leading to increased salinization and reduced agricultural yields. Agricultural runoff, contaminated with pesticides and fertilizers, further degrades water quality, harming aquatic ecosystems.

3. **Desertification:** Prolonged droughts, often linked to water scarcity, can contribute to desertification – the process by which fertile land turns into arid desert. This environmental degradation can have long-lasting consequences for affected regions, including loss of agricultural lands and increased vulnerability to natural disasters.
4. **Water Pollution:** The scarcity of water resources can lead to a concentration of pollutants in available sources. This can result in contaminated water, further affecting human health and exacerbating environmental pollution. Industrial, agricultural, and domestic waste all contribute to this issue.
5. **Extreme Weather Events:** Water scarcity is closely linked to climate change, which, in turn, leads to more

frequent and intense weather events. Droughts and heatwaves become more common, exacerbating water stress and affecting ecosystems. Flooding, when it does occur, can lead to water wastage and environmental damage.

Water-Related Conflicts and Security:

- 1. Inter-state and Intra-state Conflicts:** Water scarcity is a source of conflict, whether within nations or between them. When resources are limited, disputes over water rights can become violent, with transboundary water bodies often at the center of such conflicts.
- 2. Political Instability:** Water scarcity can contribute to political instability, making it challenging for governments to provide basic services, manage resources effectively, or respond to the needs of their populations. Failed water management can lead to public unrest, as witnessed in various regions.
- 3. Migration and Security:** As water scarcity forces people to migrate, either internally or across borders, the strain on

resources in host areas can lead to heightened tensions. Competition for dwindling water resources can escalate local conflicts.

- 4. Water Diplomacy and Cooperation:** Diplomatic efforts and cooperative agreements are essential for preventing water-related conflicts. Bilateral and multilateral agreements aim to promote responsible and equitable use of transboundary water resources, emphasizing dialogue and cooperation.

Addressing the impact of water scarcity requires a multifaceted approach that considers the socio-economic, environmental, and security dimensions of the problem. It's a challenge that transcends borders and demands concerted efforts on local, national, and international levels.

Sustainable Developmental Goal 6.1:

Water is a shared resource, and in recognizing its scarcity and the broad-reaching impacts, we acknowledge the vital importance of Sustainable Development Goal 6.1. This international commitment provides a framework to address the global water crisis, ensuring access to clean water and sanitation for all, while preserving ecosystems and promoting peace and security. In the following sections, we will explore the various aspects of water scarcity in-depth, including regional disparities, technological solutions, and global initiatives, shedding light on the path forward in tackling this critical issue.

In a world confronted by a multitude of challenges, the United Nations' Sustainable Development Goals (SDGs) stand as beacons of hope, guiding us towards a more sustainable and equitable future. Among these global goals, SDG 6.1 shines brightly as a critical imperative – the promise of clean water and sanitation for all. While water scarcity and inadequate sanitation continue to afflict

vast populations around the world, SDG 6.1 embodies the international community's commitment to ensuring access to safe and affordable drinking water for everyone.

SDG 6, officially titled "Clean Water and Sanitation," is a pivotal component of the 2030 Agenda for Sustainable Development, adopted by all United Nations Member States in 2015. It underscores the fundamental role that water plays in achieving the broader goals of ending poverty, protecting the planet, and ensuring prosperity for all. Let's delve into the significance of SDG 6.1 and its multifaceted importance:

- 1. The Right to Safe Water:** At its core, SDG 6.1 upholds the intrinsic human right to clean and safe drinking water. Access to safe water is not merely a convenience; it's a fundamental right that underpins human dignity, health, and well-being. By explicitly recognizing this right, the SDG framework advocates for the millions who have long been denied access to this basic necessity.

- 2. Health and Well-being:** The provision of clean water is inextricably linked to improved public health. Access to safe drinking water reduces waterborne diseases, mortality rates, and the burden on healthcare systems. This, in turn, results in healthier populations that can actively contribute to their communities and economies.
- 3. Eradicating Poverty:** Poverty and water scarcity are interconnected issues. In impoverished communities, individuals often spend significant time and energy fetching water from distant sources. The availability of clean water at hand allows people to focus on education, income-generating activities, and breaking the cycle of poverty.
- 4. Gender Equality:** Women and girls are disproportionately affected by water scarcity. They typically bear the responsibility of collecting water for their families, often at the cost of their education, safety, and economic empowerment. By ensuring access to clean water and sanitation, SDG 6.1 empowers women and promotes gender equality.

- 5. Environmental Sustainability:** SDG 6.1 extends its reach beyond human concerns to the environment. Accessible sanitation and clean water management are essential for preserving ecosystems and maintaining a balance between human water use and nature's capacity to regenerate. Sustainable water management practices are critical to safeguarding our planet's natural resources.
- 6. Peace and Security:** Water scarcity can be a driver of conflict and displacement, especially in regions where resources are limited. By striving to fulfill SDG 6.1, the international community takes a proactive stance against potential water-related conflicts, contributing to global peace and security.
- 7. Economic Growth:** Access to clean water is indispensable for economic development. Industries, agriculture, and infrastructure all rely on water. Reliable access to clean water and sanitation enables economic growth, job creation, and poverty reduction.
- 8. Global Solidarity:** The universality of SDG 6.1 highlights the interconnectedness of the world. It serves as a

testament to global solidarity, with developed nations committing to assisting their less fortunate counterparts in achieving this goal. The SDGs are a shared vision that transcends borders, emphasizing that no one is left behind.

9. Water Resource Preservation: By striving to make clean water and sanitation universally accessible, SDG 6.1 promotes responsible water resource management. It encourages the efficient use of water and the protection of sources and ecosystems, a vital aspect of environmental sustainability.

10. Progress Across All SDGs: Water is the lifeblood of sustainable development. Achieving SDG 6.1 has a cascading effect on the fulfillment of other SDGs. Clean water and sanitation enhance health, education, gender equality, and environmental sustainability, thereby accelerating progress across multiple dimensions.

11. Inspiring Innovation: The pursuit of SDG 6.1 catalyzes innovation in water technologies, resource management, and infrastructure development. The goal compels nations

and organizations to find novel solutions to address water scarcity and ensure equitable access.

Sustainable Development Goal 6.1 is a beacon of hope for a world grappling with water scarcity, pollution, and inadequate sanitation. Its significance is unmistakable, touching upon every facet of human well-being, ecological sustainability, and global cooperation. Yet, while it serves as a guiding light, the road ahead is marked by challenges, complexities, and the urgency of the global water crisis.

To fulfill SDG 6.1 and ensure clean water and sanitation for all, the following steps are imperative:

- 1. Local Solutions for Local Challenges:** Recognize that water scarcity and sanitation problems are often context-specific. Tailoring solutions to local needs and conditions is essential. Community-driven initiatives, focusing on cultural, geographical, and infrastructural nuances, play a pivotal role in achieving SDG 6.1.
- 2. Cross-sectoral Collaboration:** SDG 6.1 is not a solitary endeavor. Collaboration across sectors, from healthcare to

agriculture and energy, is vital. Recognize the interlinkages between water, energy, and food security, among others, and create synergistic policies and practices.

- 3. Technological Advancements:** Embrace technological innovations, from efficient water treatment processes to eco-friendly sanitation solutions. New approaches, such as desalination, wastewater recycling, and decentralized water supply systems, can be game-changers.
- 4. Sustainable Water Management:** Prioritize sustainable water management that accounts for both the needs of current and future generations and respects the natural boundaries of ecosystems.
- 5. Empowerment and Education:** Empower communities with the knowledge and skills to manage their water resources effectively. Water education and awareness campaigns are instrumental in driving sustainable practices.
- 6. Policy Commitments and Financing:** Political will and financial investments are essential. Governments and

international organizations must uphold their commitments to SDG 6.1 and allocate the necessary resources to achieve this goal.

Sustainable Development Goal 6.1 encapsulates the collective aspiration to ensure that water is a source of life and prosperity, not a cause of suffering and division. It reminds us of our duty to safeguard this precious resource for current and future generations.

As we explore the multifaceted dimensions of water scarcity in the subsequent sections of this analysis, it is vital to keep in mind that the pursuit of SDG 6.1 is not just a mission—it is an embodiment of hope. It embodies our commitment to a world where no one is left thirsty, and where clean water and sanitation are within reach of all, ultimately creating a more equitable and sustainable future for our planet.

Solar Desalination Geoassisted Continuous (SGDC):

As the world struggles with the ever-pressing issue of water scarcity, innovative technologies and sustainable solutions have emerged as beacons of hope in addressing this global crisis. Among these groundbreaking developments is the Solar Desalination Geoassisted Continuous (SDGC) device. In the context of Sustainable Development Goal 6.1 (SDG 6.1), which aims to achieve universal and equitable access to safe and affordable drinking water for all, the SDGC device stands out as a promising advancement that aligns with the spirit and goals of this critical international initiative.

Water scarcity goes beyond a mere lack of access to water; it encompasses issues of water quality, quantity, and reliability. In many regions, the scarcity of freshwater has reached alarming levels, affecting the basic needs of billions of people. The consequences are far-reaching and touch every facet of life, including food security,

economic development, and political stability. With agriculture being the largest consumer of freshwater resources, reduced access to water directly threatens food production and exacerbates global hunger.

Furthermore, water scarcity has the potential to ignite conflicts and tensions at local, regional, and international levels. The phrase "water wars" is no longer a speculative concept but an unfortunate reality in certain parts of the world. The competition for limited water resources can lead to disputes that have lasting impacts on the peace and stability of entire regions. It is in this context that the significance of SDG 6.1 becomes clear.

The SDGC device, in its essence, embodies the principles and objectives of SDG 6.1. This innovative technology addresses the scarcity of clean water through a sustainable, environmentally friendly approach that harnesses the power of the sun and geoassisted systems. It is not only a potential solution to the water scarcity crisis but also a symbol of human ingenuity in the face of global challenges.

The invention known as the "Solar Desalination Geoassisted Continuous" (SDGC) device is a groundbreaking method and device designed to address water scarcity by desalinating seawater, brackish water, and water from industrial processes. This invention is particularly notable for its ability to operate in a continuous and self-sustained mode while utilizing renewable energy sources, including solar and geothermal energy. The SDGC device offers a unique solution to the pressing global need for freshwater, especially in regions where natural sources are limited or have been depleted.

Water scarcity, exacerbated by factors such as population growth, climate change, and over-extraction, has become a pressing issue. Traditional desalination technologies, which typically rely on electrical or thermal energy, have often overlooked efficient energy management. This invention aims to bridge this gap by harnessing renewable energy sources, including thermal and electric solar, geothermal, photovoltaic, or wind energy, and optimizing their use in a moderate-temperature regime.

At its core is a large, thermally insulated tank, meticulously designed to efficiently desalinate seawater, brackish water, and water from industrial processes. This advanced device presents a holistic approach to address the pressing global issue of water scarcity.

The tank serves as the epicenter of the SDGC, housing the water earmarked for desalination. Its substantial size is complemented by thermal insulation, a crucial component ensuring optimal performance. The success of the desalination process hinges on the orchestrated interplay of various components within the device.

A critical element is the heating means, embodied by the first heat exchanger strategically positioned near the free surface of the water within the tank. This heat exchanger is not just a conduit for warming the water; it is an integral part of a larger system connected to a heat transfer fluid powered by renewable energy sources. Solar, geothermal, or wind energy can be harnessed to heat the water, kickstarting the evaporation process.

Above the free water surface, the cooling means take the form of stretched metal sheets. These sheets play a dual role: facilitating the condensation of steam generated during evaporation and engaging in a continuous heat exchange. As steam condenses, it releases latent heat, influencing the cooling means' temperature reduction and elevating the temperature of the water in the tank's depth.

Augmenting the structure are additional heat exchangers, with a second heat exchanger positioned above the free surface and a third below it. These components play a pivotal role in efficiently transferring heat from the condensed water to the tank's water, contributing to the overall effectiveness of the desalination process.

To ensure the seamless functioning of the SDGC device, a conveying system is incorporated. This system diligently collects the condensed water from the cooling means, streamlining the extraction process for further use. The level control mechanism, featuring a level relief device and a valve under its control, plays a vital role in

maintaining a consistent water level within the tank. This not only guarantees a continuous operation but also optimizes the device's efficiency.

In operation, the SDGC device follows a meticulous sequence. The water near the surface is heated, initiating evaporation. The resulting steam, laden with the promise of freshwater, encounters the cooling means where it undergoes condensation. Convective motions in both the water and steam optimize heat exchange, contributing to increased evaporation rates.

What sets the SDGC apart is not just its efficient design but its commitment to sustainability. The use of renewable energy sources, careful insulation, and the incorporation of heat recovery mechanisms position the device as an eco-friendly and economically viable solution to water scarcity. Its innovative structure and eco-conscious operation hold immense promise, offering a transformative solution for regions grappling with severe water supply challenges. The SDGC device emerges as a

symbol of progress, harnessing technology to address one of humanity's most pressing concerns.

The Solar Desalination Geoassisted Continuous (SDGC) device offers a myriad of advantages, positioning itself as an innovative and sustainable solution to address the challenges associated with water scarcity. Its unique design and operational features contribute to its effectiveness and make it a promising technology for diverse applications globally.

- 1. Sustainable and Renewable Energy Integration:** One of the primary advantages of the SDGC device is its reliance on renewable energy sources, particularly solar and geothermal energy. By harnessing the power of the sun and the Earth's subsurface, the device minimizes its carbon footprint, contributing to environmental sustainability. This emphasis on clean energy aligns with global efforts to transition away from fossil fuels, addressing both water scarcity and the broader goal of sustainable energy use.

- 2. Continuous Operation and Reliability:** The SDGC device operates in a continuous and self-supported mode, ensuring a steady production of freshwater. This reliability is crucial in regions facing persistent water scarcity issues. Unlike traditional desalination methods that may be intermittent or dependent on external energy sources, the SDGC's continuous operation enhances its overall effectiveness and resilience.
- 3. Closed-Loop System for Water Conservation:** The closed-loop system within the SDGC promotes efficient water usage and conservation. The convective motions engineered within the device create an aqueous counter-current flow stream, strategically managing water movement. This design minimizes water wastage and optimizes the desalination process, addressing the need for responsible water management practices.
- 4. Climate-Resilient Technology:** As climate change continues to impact global weather patterns, having technologies that are resilient to these changes becomes imperative. The SDGC's low-temperature regimes and

reliance on renewable energy sources make it inherently climate-resilient. This feature aligns with Sustainable Development Goal 13 (Climate Action) and ensures that the device can provide a consistent freshwater supply even in the face of changing environmental conditions.

- 5. Low Operating Costs:** The SDGC device boasts low operating costs, a critical factor in making freshwater production economically viable. By utilizing renewable energy and optimizing heat exchange processes, the device minimizes the need for costly energy inputs. This economic efficiency contributes to the affordability of the freshwater produced, aligning with the principles of Sustainable Development Goal 6.1.
- 6. Efficient Heat Exchange and Evaporation:** The mechanism of the SDGC device optimizes heat exchange and evaporation processes, leading to higher efficiency in freshwater production. The convective motions in both the water and steam phases maximize heat transfer, resulting in accelerated evaporation rates. This efficiency ensures

that the device can produce a significant volume of freshwater with minimal energy consumption.

- 7. Versatility in Water Sources:** The SDGC device is designed to desalinate various water sources, including seawater, brackish water, and industrial process water. This versatility makes it applicable in diverse settings, from coastal regions struggling with seawater intrusion to arid areas dealing with brackish groundwater. The device's adaptability enhances its potential impact in addressing water scarcity on a global scale.
- 8. Minimal Environmental Impact:** Compared to traditional desalination methods, which often involve the combustion of fossil fuels, the SDGC device has a minimal environmental impact. Its use of renewable energy and closed-loop system reduces greenhouse gas emissions, contributing to environmental conservation. This aligns with Sustainable Development Goal 15 (Life on Land) by promoting responsible land and resource use.
- 9. Support for Local Water Independence:** The SDGC device empowers communities and regions to achieve

water independence. By relying on locally available and renewable energy sources, it reduces dependence on centralized water infrastructure and distant water supplies. This decentralization aligns with the principles of resilience and adaptability, ensuring that communities can sustainably meet their water needs.

10. Technological Innovation and Global Relevance: As a cutting-edge technology, the SDGC device represents a significant innovation in the field of desalination. Its global relevance is underscored by its potential to provide freshwater in regions where traditional methods may be impractical or environmentally unsustainable. The device's technological advancements contribute to the ongoing dialogue on sustainable water solutions.

The Solar Desalination Geoassisted Continuous (SDGC) device stands out as a versatile, efficient, and sustainable solution to address water scarcity. Its integration of renewable energy, continuous operation, water conservation features, and minimal environmental impact position it as a technology with the potential to make a

meaningful contribution to achieving global water security. As nations and communities grapple with the complex challenges of water scarcity, the SDGC device emerges as a beacon of innovation, offering tangible solutions for a more sustainable and water-abundant future.

Case Studies for SDGC:

The Solar Desalination Geoassisted Continuous (SDGC) device exhibits versatility in its ability to address water scarcity across various contexts. Here are several case studies highlighting potential applications of the SDGC device:

- 1. Coastal Areas Facing Seawater Intrusion:** In coastal regions grappling with the detrimental effects of seawater intrusion into aquifers, the Solar Desalination Geoassisted Continuous (SDGC) device emerges as a beacon of hope. Seawater intrusion poses a significant threat by compromising freshwater resources vital for agriculture, drinking water supplies, and the overall health of ecosystems. The application of SDGC in these vulnerable coastal areas offers a transformative solution. By harnessing renewable energy sources, such as solar and geothermal power, the device can efficiently desalinate seawater, presenting a local and sustainable source of freshwater. This innovative approach directly addresses

the adverse impacts of saltwater intrusion. The desalinated water produced by the SDGC device becomes a crucial resource for mitigating agricultural challenges, ensuring a reliable drinking water supply, and safeguarding the delicate balance of coastal ecosystems. The deployment of SDGC in coastal areas not only provides a resilient response to the immediate freshwater scarcity caused by seawater intrusion but also contributes to the long-term environmental sustainability of these coastal ecosystems. This application stands as a testament to the device's ability to combat the pressing water challenges faced by communities in the coastal regions, offering a path towards water security and ecological well-being.

- 2. Arid Regions with Limited Freshwater Resources:** Arid and semi-arid regions face formidable challenges due to limited access to freshwater, often relying on scarce traditional water sources. The Solar Desalination Geoassisted Continuous (SDGC) device emerges as a transformative solution for these areas, offering a sustainable means of addressing water scarcity. In such

regions, where traditional water sources are insufficient, implementing SDGC provides an opportunity to desalinate brackish groundwater or tap into local saline aquifers. The device's reliance on renewable energy, particularly solar and geothermal power, makes it an ideal fit for off-grid applications, ensuring that communities in arid regions have access to an independent and continuous water supply. By addressing the pressing issue of water scarcity in these regions, SDGC becomes a beacon of hope for communities struggling with limited freshwater resources.

3. Remote Islands Dependent on Imported Water:

Remote islands, surrounded by the vast expanse of the ocean, often find themselves heavily reliant on imported water due to limited local freshwater availability. Introducing SDGC to these islands represents a significant step toward achieving water independence and sustainability. The device harnesses solar and geothermal energy, providing a sustainable, cost-effective, and independent source of freshwater. By significantly reducing dependency on water imports, SDGC contributes

to water resilience on islands, ensuring a consistent and reliable supply. This application not only addresses the immediate water needs of these island communities but also fosters long-term sustainability and self-sufficiency, making SDGC a vital tool for islands facing unique water challenges.

4. Industrial Processes Generating Brackish Water:

Industrial processes often generate brackish water as a byproduct, contributing to environmental challenges and posing a threat to local water sources. Integrating SDGC into industrial facilities offers a sustainable solution for treating brackish water. Beyond its desalination capabilities, the device aligns with corporate social responsibility goals by minimizing the environmental impact of industrial processes. The efficient treatment of brackish water by SDGC showcases its versatility in promoting environmental sustainability and addressing water scarcity concerns in industrial settings. As industries increasingly recognize the importance of responsible water

management, SDGC emerges as a valuable ally in achieving both environmental and operational objectives.

5. Agriculture in Water-Scarce Regions: Water scarcity in agricultural regions, where irrigation demands often exceed available freshwater resources, poses a significant challenge to food security. Implementing SDGC in agriculture revolutionizes water management by providing a decentralized and continuous source of irrigation water. By utilizing renewable energy sources, the device supports sustainable farming practices, ensuring crop yield and food security in water-stressed regions. The significance of SDGC in transforming agricultural water management practices extends beyond immediate water supply needs; it aligns with broader goals of resource efficiency, environmental sustainability, and resilience in the face of climate change. In water-scarce agricultural landscapes, SDGC becomes a pioneering solution, offering a paradigm shift in how water resources are utilized and managed.

6. Refugee Camps and Humanitarian Aid: In refugee camps and humanitarian crises, where access to clean

water is a critical challenge, SDGC emerges as a lifeline. The device's ability to offer an independent and sustainable water source reduces reliance on external water supplies, addressing an immediate need in crisis situations. Beyond the practicalities of water supply, SDGC promotes dignity, health, and self-sufficiency for displaced populations. The adaptability of SDGC to challenging environments positions it as a crucial tool in humanitarian aid efforts. By providing a reliable source of clean water, SDGC not only meets a fundamental human need but also contributes to the overall well-being and resilience of communities facing the challenges of displacement and crisis.

7. Remediation of Contaminated Water Bodies:

Contaminated water bodies resulting from industrial processes pose severe environmental and health risks. SDGC's application in desalination for contaminated water bodies supports remediation efforts, showcasing its potential for environmental restoration. The device's capacity to produce freshwater while addressing water

pollution contributes to the restoration of ecosystems and community well-being. By effectively treating contaminated water, SDGC becomes a key player in addressing the consequences of industrial activities on water quality. This innovative approach underscores SDGC's broader impact beyond conventional desalination applications, positioning it as a valuable asset in environmental remediation efforts.

- 8. Off-Grid and Remote Communities:** Remote communities lacking access to centralized water infrastructure often depend on distant water sources, facing challenges in maintaining a reliable water supply. SDGC provides a sustainable and off-grid solution for these communities, reshaping the dynamics of water access. By tapping into local renewable energy sources, the device ensures a continuous water supply, reducing dependence on external water supply systems. The importance of SDGC in offering off-grid solutions extends beyond immediate water needs; it fosters sustainability, resilience, and self-sufficiency in remote communities. In

these settings, where conventional water infrastructure may be impractical or unavailable, SDGC becomes a catalyst for positive change, empowering communities to manage their water resources effectively.

9. Post-Natural Disaster Recovery: Natural disasters disrupt water infrastructure and supply chains, creating immediate challenges for affected areas. SDGC, with its off-grid capabilities and reliance on renewable energy, emerges as a rapid and sustainable water supply solution in post-disaster scenarios. The device's quick deployment and self-sufficiency contribute to efficient post-disaster recovery, addressing the immediate need for clean water in critical situations. SDGC's adaptability to emergency response and recovery efforts positions it as a valuable tool in building resilience against the water-related impacts of natural disasters. By providing a reliable and independent water source, SDGC supports communities in the challenging task of recovery and rebuilding.

10. Agricultural Drainage Water Reuse: In agricultural regions where excess saline drainage water contributes to

environmental challenges, SDGC presents a novel solution for sustainable water reuse. By integrating SDGC into agricultural drainage systems, it allows for the efficient desalination and reuse of saline water. This not only minimizes environmental impact but also supports sustainable water practices in agriculture. SDGC's role in transforming agricultural drainage water into a valuable resource showcases its potential in promoting circular water management systems and sustainable agricultural practices. In addressing the specific challenges of agricultural drainage, SDGC becomes a key player in advancing water sustainability in the agricultural sector.

11. Industrial Wastewater Treatment: Industries generating wastewater with high salinity levels face challenges in sustainable disposal and environmental impact. SDGC plays a crucial role in industrial wastewater treatment, providing an environmentally friendly solution for desalination. By treating industrial wastewater, the device contributes to water resource conservation and minimizes the environmental impact of industrial discharges. This

application aligns with sustainability goals, emphasizing the broader implications of SDGC in addressing industrial water challenges. As industries increasingly prioritize responsible wastewater management, SDGC emerges as a transformative technology, offering a sustainable and efficient solution for desalinating industrial wastewater and promoting environmental stewardship.

In conclusion, the Solar Desalination Geoassisted Continuous (SDGC) device stands at the forefront of addressing diverse water challenges across a spectrum of scenarios. From mitigating water scarcity in arid regions to promoting water resilience on remote islands, and from revolutionizing agricultural water management to providing a lifeline in humanitarian crises, SDGC's impact is far-reaching. Its adaptability, reliance on renewable energy, and focus on sustainability make it a pivotal tool in achieving water-related Sustainable Development Goals. As we navigate a future where water scarcity is a pressing global issue, SDGC emerges as a beacon of hope,

offering innovative solutions to transform the way we manage and utilize our most precious resource, water.

SDGC in Small Communities:

Empowering local communities to harness the benefits of the Solar Desalination Geoassisted Continuous (SDGC) device involves a comprehensive and collaborative approach. By integrating community engagement, technical knowledge, and sustainable practices, communities can not only utilize SDGC but potentially take steps towards building their own. This guide outlines a step-by-step process for communities to make use of SDGC and explore the possibility of constructing their own devices.

1. Community Mobilization:

Initiating community engagement is crucial for the success of any water-related initiative. Communities need to be informed, aware, and actively involved in decision-making processes.

- **Education and Awareness:** Conduct awareness campaigns to educate the community about water scarcity,

emphasizing the benefits of desalination and the potential of SDGC.

- **Community Meetings:** Organize regular community meetings to facilitate open discussions about water challenges, potential solutions, and the role of SDGC in addressing these issues.

2. Assessment of Water Needs:

Understanding the community's specific water requirements is fundamental for tailoring the SDGC implementation to local needs.

- **Water Demand Analysis:** Assess the community's water needs by considering factors such as population size, agricultural requirements, and industrial demands.
- **Water Quality Testing:** Conduct water quality tests to understand the specific characteristics of local water sources and ensure compatibility with the SDGC system.

3. Technical Training and Capacity Building:

Building local capacity is essential for the sustainable operation and maintenance of SDGC devices.

- **Collaborate with Experts:** Seek collaboration with local universities, technical institutions, or organizations with expertise in renewable energy and desalination technologies.
- **Training Programs:** Conduct training programs to empower community members with the technical knowledge required for the operation and maintenance of SDGC.

4. Feasibility Study:

A thorough feasibility study ensures that the implementation of SDGC is well-suited to the local conditions and needs.

- **Site Assessment:** Conduct a site assessment to determine the suitability of SDGC implementation, considering factors such as solar exposure, geothermal potential, and water salinity.

- **Resource Mapping:** Map available renewable energy resources (solar and geothermal) to optimize the design of the SDGC device.

5. Community-Based Design:

Involving the community in the design process ensures that the SDGC system is tailored to local preferences and conditions.

- **Participatory Design:** Engage community members in the design process, considering their input, needs, and preferences for the SDGC system.
- **Adaptability:** Design the SDGC system to be adaptable to local conditions, emphasizing simplicity and ease of maintenance.

6. Resource Procurement:

Efficient resource procurement, especially locally sourced materials, contributes to the sustainability of the project.

- **Local Materials:** Source materials locally to reduce costs and promote sustainability, supporting the local economy.

- **Renewable Energy Components:** Procure solar panels, geothermal components, and other necessary equipment from reliable suppliers, ensuring the use of quality materials.

7. Construction and Assembly:

The construction phase involves community members in the actual building of the SDGC device, promoting a sense of ownership and involvement.

- **Community Workshops:** Organize workshops or training sessions for community members to actively participate in the construction process.
- **Supervision:** Collaborate with experienced technicians or engineers to supervise the construction, ensuring quality and compliance with design specifications.

8. Installation and Testing:

Installation of the SDGC system is followed by testing to ensure proper functioning and performance.

- **Gradual Implementation:** Install the SDGC device gradually, testing its components and adjusting parameters as needed to optimize performance.
- **Performance Monitoring:** Implement a system for monitoring the device's performance, including water production rates and energy consumption.

9. Maintenance and Operation:

Local communities need to take ownership of the maintenance and day-to-day operation of the SDGC system.

- **Community Ownership:** Foster a sense of community ownership by involving local residents in the regular maintenance and operation of the SDGC device.
- **Training on Maintenance:** Conduct training sessions on basic maintenance procedures to ensure the longevity and efficiency of the system.

10. Community Water Management:

Efficient water management strategies ensure equitable access and distribution of desalinated water within the community.

- **Water Distribution Plan:** Develop a community water distribution plan to ensure equitable access to desalinated water, considering varying needs and priorities.
- **Educational Programs:** Continue educational programs on water conservation and efficient use of desalinated water to maximize the benefits of the SDGC system.

11. Monitoring and Evaluation:

Continuous monitoring and evaluation are essential for ongoing improvement and the long-term sustainability of the SDGC system.

- **Continuous Improvement:** Establish a feedback mechanism for community members to report issues and provide suggestions for improvements.

- **Periodic Evaluations:** Conduct periodic evaluations of the SDGC system's performance, adjusting parameters and making upgrades as necessary.

12. Documentation and Knowledge Sharing:

Documenting the entire process and sharing knowledge gained ensures transparency and facilitates future initiatives.

- **Documentation:** Document the planning, design, construction, and implementation phases comprehensively to create a guide for future initiatives.
- **Knowledge Sharing:** Share the acquired knowledge with neighboring communities, promoting a collaborative and region-wide approach to addressing water scarcity.

By following these steps, local communities can not only successfully implement SDGC devices but also develop the skills and knowledge necessary to potentially construct similar systems independently. This community-driven approach ensures that SDGC becomes a sustainable and

empowering solution for addressing water scarcity challenges at the grassroots level.

The Solar Desalination Geoassisted Continuous (SDGC) device offers a sustainable and affordable solution for poor countries and communities facing water scarcity challenges. Several factors contribute to its suitability in these contexts:

Renewable Energy Dependency: SDGC relies on renewable energy sources such as solar and geothermal energy. In many poor countries, sunlight is abundant, presenting an opportunity to harness solar power for water desalination without the need for extensive and expensive energy infrastructure. This dependence on renewable energy reduces operational costs and ensures affordability.

Off-Grid Capability: One of the remarkable features of SDGC is its off-grid capability. Many poor communities lack access to centralized power grids. SDGC's ability to operate independently of traditional power sources makes it feasible for deployment in remote or off-grid areas. This

decentralization minimizes the costs associated with connecting to centralized utilities.

- 1. Low Operating Costs:** The device is designed for low operating costs, making it economically viable for resource-constrained communities. The use of renewable energy, combined with the continuous and self-supported desalination process, contributes to efficiency and cost-effectiveness. Reduced dependence on external energy sources ensures that the ongoing expenses for operating SDGC remain manageable.
- 2. Adaptability to Local Conditions:** SDGC's versatility and adaptability make it suitable for various environmental conditions. Its applicability to seawater, brackish water, and industrial process water allows it to address diverse water scarcity challenges. This adaptability ensures that communities can tailor the device to their specific needs, optimizing its efficiency.
- 3. Minimal Infrastructure Requirements:** Implementation of SDGC doesn't demand extensive infrastructure. The device can be integrated into existing water management

systems with relative ease. Its closed-loop system and straightforward design contribute to minimal maintenance requirements, reducing the overall investment and making it accessible for communities with limited resources.

- 4. Water Security for Agriculture:** In many poor countries, agriculture is a primary source of livelihood. SDGC's potential to provide a continuous and decentralized source of freshwater supports sustainable agricultural practices. This contributes to food security, economic stability, and poverty reduction, aligning with broader development goals beyond water access.
- 5. Modular Design and Scalability:** SDGC's modular design allows for scalability based on the community's water desalination needs. Poor communities can start with smaller-scale implementations, and as their needs grow, they can expand the system. This phased approach facilitates affordable initial investments and gradual scalability as resources become available.
- 6. Community Engagement and Empowerment:** The simplicity of SDGC's design and operation allows for

community involvement in its implementation and maintenance. This not only empowers local communities but also reduces reliance on external expertise, making the device a community-driven solution. Empowered communities are more likely to sustain and adapt the technology to their evolving needs.

- 7. Addressing Water-Related Health Challenges:** Access to clean water is integral to public health. SDGC's ability to provide a consistent and safe water supply addresses water-related health challenges prevalent in many poor communities. Reduced waterborne diseases contribute to improved community well-being, further justifying the investment in such sustainable water solutions.

The SDGC device's reliance on renewable energy, off-grid capability, low operating costs, adaptability, minimal infrastructure requirements, and community-centric design collectively position it as a sustainable and affordable solution for poor countries and communities grappling with water scarcity. Its holistic approach addresses both immediate water access needs and long-term development

goals, offering a pathway to improved living conditions and resilience in the face of water challenges.

The key advantage of SDGC lies in its sustainability and affordability, especially for resource-constrained communities. The device's reliance on locally available and renewable energy sources makes it cost-effective and ensures operational independence. This affordability is crucial for communities that may lack access to centralized water infrastructure or have limited financial resources.

The Solar Desalination Geoassisted Continuous device (SDGC) emerges as a game-changer, poised to usher in economic prosperity within underserved communities. This transformative device addresses a fundamental need by providing a consistent and affordable source of freshwater, thereby becoming the cornerstone for various economic opportunities that can uplift these communities.

Agricultural Growth:

One of the primary avenues through which SDGC fosters economic prosperity is by ensuring a reliable water supply for agricultural activities. In underserved communities, where traditional water sources may be scarce, SDGC becomes a lifeline for farmers. The device facilitates irrigation, empowering farmers to diversify their crops, improve yields, and engage in commercial farming practices. This not only enhances food security within the community but also creates a surplus that can be directed to local markets, generating income for farmers and contributing to the economic vitality of the region.

Entrepreneurial Ventures:

The availability of freshwater through SDGC opens up new horizons for entrepreneurial ventures within underserved communities. Local businesses can emerge around water-based activities, such as fish farming and aquaculture. SDGC, by ensuring a continuous and reliable water supply, supports the establishment of water-intensive industries, fostering economic diversity.

Entrepreneurs within the community can seize these opportunities, leading to the creation of businesses that contribute to local economic growth.

Job Creation:

The installation, maintenance, and operation of SDGC units contribute significantly to job creation within the community. By training locals as technicians responsible for the device, the community becomes self-reliant in managing its water resources. This not only ensures the sustainability of the SDGC units but also creates employment opportunities for community members. Sustainable job creation is a key component of economic development, and SDGC becomes a vehicle for empowering individuals with valuable skills and contributing to the economic well-being of the community.

Healthcare and Education:

Reliable access to clean water facilitated by SDGC has a direct and positive impact on community health and education. Reduced incidents of waterborne diseases lead to healthier populations, decreasing the financial burden on healthcare systems. With improved health outcomes, communities can allocate resources that would have been spent on healthcare to education and skill development. This virtuous cycle promotes the overall well-being of the community, creating a foundation for sustainable economic growth.

Community Resilience:

SDGC not only addresses immediate water needs but also enhances community resilience to climate change. By mitigating water scarcity risks, the device becomes a crucial tool in safeguarding livelihoods. In regions where migration due to water-related challenges is a constant threat, SDGC acts as a barrier, preserving community cohesion and fortifying the population against external shocks. Community resilience is a key component of

sustainable development, and SDGC plays a pivotal role in ensuring that underserved communities can withstand the impacts of environmental challenges.

The Solar Desalination Geoassisted Continuous device emerges as a catalyst for economic prosperity within underserved communities. Its multifaceted impact on agricultural growth, entrepreneurial ventures, job creation, healthcare, education, and community resilience makes it a transformative force. By addressing the fundamental need for a reliable freshwater supply, SDGC becomes the cornerstone for sustainable economic development, uplifting the socio-economic fabric of underserved communities and paving the way for a brighter and more prosperous future.

Conclusion:

The Solar Desalination Geoassisted Continuous device (SDGC) stands at the forefront of innovation in addressing water scarcity, presenting a paradigm shift in how communities, particularly in underserved areas, can access a sustainable and affordable source of freshwater. As we navigate the complexities of achieving Sustainable Development Goal 6.1 (SDG 6.1), aiming for universal and equitable access to safe and affordable drinking water for all, the SDGC emerges as a potent solution that not only meets this specific goal but also catalyzes positive transformations in various socio-economic and environmental dimensions.

The unique mechanism of the SDGC serves as the linchpin of its success. By harnessing the power of renewable energy sources, such as solar and geothermal energy, this device embodies a commitment to sustainability. Its innovative design, encapsulated in a large thermally insulated tank, coupled with strategically

positioned heat exchangers and cooling means, enables the continuous desalination of seawater and brackish water. The evaporation-condensation cycle, facilitated by convective motions, optimizes heat exchange rates, ensuring efficiency in water production. The SDGC's adaptability to locally available resources further enhances its appeal as a community-driven, eco-friendly solution.

In understanding the significance of the SDGC in achieving SDG 6.1, it becomes evident that this device transcends its role as a water desalination apparatus. It becomes a beacon of hope for communities facing critical water supply challenges. The versatility of the SDGC's application across diverse scenarios, from coastal areas experiencing seawater intrusion to arid regions with limited freshwater access, showcases its ability to tailor solutions to the unique water needs of different regions. This adaptability is crucial in the pursuit of universal access to safe drinking water.

Moreover, the impact of the SDGC extends beyond addressing immediate water scarcity concerns. Its integration into industrial processes, agricultural practices, and post-natural disaster scenarios demonstrates a holistic approach to water management. In industrial settings, where brackish water is often a byproduct, the SDGC offers a sustainable solution that aligns with corporate social responsibility goals. In agriculture, particularly in water-scarce regions, the device supports sustainable farming practices, ensuring food security and economic stability.

The economic implications of the SDGC in underserved areas cannot be overstated. The device operates as a catalyst for economic growth by providing a continuous and reliable source of water. In remote islands dependent on imported water, the SDGC reduces reliance on external sources, promoting water resilience and cost-effectiveness. In refugee camps and post-natural disaster recovery efforts, the SDGC becomes a lifeline, offering dignity, health, and self-sufficiency to displaced populations.

A critical aspect of the SDGC's appeal is its affordability and sustainability, particularly in the context of impoverished countries and communities. The device's reliance on locally available resources, coupled with its use of renewable energy, ensures that it can be implemented without placing undue financial burdens on communities. This affordability, combined with the sustainable nature of the SDGC, creates a powerful model for water solutions that empower communities to break free from the cycle of water scarcity.

As we delve into the environmental impact of the SDGC, its significance becomes even more pronounced. By remediating contaminated water bodies, reusing agricultural drainage water, and operating as an off-grid solution for remote communities, the device contributes to environmental conservation. Its eco-friendly design minimizes the carbon footprint associated with traditional water desalination methods, aligning with global efforts to combat climate change and preserve ecosystems.

In conclusion, the SDGC emerges not only as a technological marvel but as a symbol of hope and resilience in the face of one of humanity's most pressing challenges – water scarcity. Its ability to harmonize with the principles of sustainability, affordability, and adaptability positions it as a transformative force in achieving SDG 6.1. The economic, social, and environmental impacts ripple far beyond the desalination process, touching the lives of individuals and communities around the world. As we envision a future where access to safe drinking water is a universal reality, the SDGC stands as a beacon, guiding us toward a more sustainable and water-secure world.

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Bibliography/Conclusion

Any reference to people and things is purely coincidental, as well as creative/imaginative and aimed at the common good (both in fiction and non-fiction/disclosable texts).

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Watermaker from SDGC (source) :

Patent:

[SDGC , https://patentscope.wipo.int/search/en/detail.jsf?docId=WO2016162896](https://patentscope.wipo.int/search/en/detail.jsf?docId=WO2016162896) (sea and process water solar desalination); [view1](#)

Italy: GRANT

http://www.expotv1.com/LIC/MISE_0001429306_SDGC.pdf, ... mean "INDUSTRY (useful), NEW (no make before), INVENTIVE (teach some things)".

Abstract/Description - Patent:

SDGC, <https://patentscope.wipo.int/search/en/detail.jsf?docId=WO2016162896>

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Summary – Applications (to SDGs)

SDGC

<https://patentscope.wipo.int/search/en/detail.jsf?docId=WO2016162896>

Water – great efficiency in DESALINING with renewable sources. **SDGC** is dedicated to desalination (of sea water, brackish water or bodies of water to be reclaimed), has the advantage of using only renewable energy and with performance indices comparable to Reverse Osmosis (dependent on fossils); the system is scalable from small to large installations, offering the possibility of implementing distributed **& pervasive** and counteracting critical logistics issues (often a serious problem). An infrastructural supply of "fresh" water towards the general plant engineering industry and in particular that for the production of hydrogen. Drastic action towards the Inorganic load, contributing to the performance on " **Water cycle** ".

Project:

SDGC – Solar Desalination Geoassisted Continuous

Objective : Launch an assembly and testing site (procedures and manuals) for the production of SDGC

tanks (of assorted cuts and functions, reclamation of water bodies or production for food purposes).

Target: Prefabricated and container companies, hydromechanics , financial investors, operators in the fresh water sector, purification operators

The project aims to activate a production site, from design to assembly (pro delivery and rapid assembly), with the development of production-oriented procedures agreed with the client (based on the available inputs) and the destinations of the outputs produced. The solutions rely on standard products from the water management and prefabricated market (including containers), assembled and tested with a view to optimizing distillation using solar energy and support from thermal gradients. In collaboration with internal and external laboratories, it will act as remote support for the installations in charge (EPC - Engineering , Procurement and Construction).

Summary: This invention talks about how a machine can remove salt from sea water, salt water or water that comes from factories. This machine can use energy that comes

from the sun, wind or underground. To remove salt from water, you need to make the water turn into steam and then turn it back into water (all at usual thermal conditions, for example how dew is produced). We plan to proceed as follows:

- put the water in a closed tank where the steam will be produced;
- heat the water near the surface, so it produces more steam;
- causes the steam to become water again, encountering colder surfaces (expanded metal arranged in a fan), adjacent to parts to which they will release the heat to even colder but liquid parts, fueling the convective motions in the liquid part, which then traces and reiterates the process;
- collects the condensed water, without salts, in suitable reservoirs and from which it is taken.

The machine is a well-insulated tank, into which water is introduced in continuous processes. Inside the tub there are devices that heat the water to make it steam. There are also means that turn the steam back into water and that collect the water without salt, transferring the energy by-passing critical areas (the key to conservation and reduced

need for energy). These means are made like this:

- the tank is filled with water up to a certain point (approximately $2/3$), so the condensation process is completed in the empty space above;
- the half -radiators, which heat the water , are close to the surface of the water and will be powered by natural sources (possibly supported by heat pumps);
- the means that create water vapor are on the surface of the water and heat in a limited way, inside the water, thus giving off a lot of heat;
- from the proposed reservoirs, the condensed water (which arrives by gravity and free of any salt) is taken from the coldest surfaces encountered, similar to the temperature regimes of storm processes in the tropics.

The machine uses the available renewable energy well , both solar and environmental conditions, fueling convective motions, both in the aerial and liquid parts, taking care not to lose energy, thanks to adequate insulation and prepared exchangers; The machine can use both energy that comes from the sun, wind or underground, and energy that comes from other sources. This machine is used to make clean (distilled) water, useful for many things: for factories, for plants, for animals and also for people (suitably integrated with the

desired salts for drinking and nothing for industries, which they like even less – hard waters). This machine can help remove countless impurities resulting from many industrial and anthropic processes in general. In an indirect way, therefore, to remedy many ongoing social disparities in many communities .

[SDGs / UN_en](#) - [SDGs / UN_it](#) *Full Strategy to*
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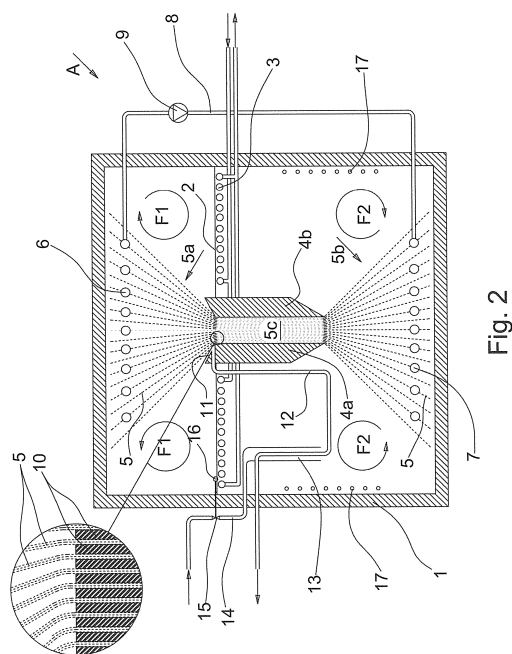


Fig. 2

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(71) Applicant(s):

LAVANGA, Vito [IT/IT]; Via Terrazzano 85 I-20017 Rho
(MI) (IT) (for all designated states)

(72) Inventor(s):

LAVANGA, Vito; Via Terrazzano 85 I-20017 Rho (MI)
(IT)

FARNE', Stefano; Via Trasimeno 40/14 20128 - Milano
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(54) Title (EN): METHOD FOR THE CONTINUOUS
DESALINIZATION AND DEVICE FOR THE
IMPLEMENTATION OF SAID METHOD

(54) Title (FR): PROCÉDÉ POUR LA
DÉSALINISATION CONTINUE ET DISPOSITIF POUR
LA MISE EN ŒUVRE DUDIT PROCÉDÉ

(57) Abstract:

(EN): This invention refers to a method and a device for desalinating sea water, brackish water or from industrial processes. The device is suitable to use renewable energy sources such as solar or geothermal energy. The device is of the type that includes a tank (1) for the containment of the water to desalinate, in which there are heating means fitted to cause the evaporation of said water to desalinate, cooling means fitted to favour the subsequent condensation of the steam and means fitted to the collection of the condensed water and it is characterized in that: said tank (1), fitted to contain said water to desalinate, is filled up to a certain level (2); said heating means, for evaporating said water include a first heat exchanger (3), immersed in the water to desalinate and positioned nearby said level (2); said cooling means (5a), fitted to cause the condensation of the steam, are in heat exchange connection with the heating means (5b), immersed in said water to desalinate, said heat exchange simultaneously causing: a) the reduction of the temperature of said means (5a), therefore the suitable

conditions for the condensation of the steam; b) the increase in temperature, into the depths, of said water to desalinate.

(FR): La présente invention concerne un procédé et un dispositif de désalinisation d'eau de mer, d'eau saumâtre ou provenant de processus industriels. Le dispositif est approprié pour l'utilisation de sources d'énergie renouvelable, telles que l'énergie solaire ou géothermique. Le dispositif est du type comprenant un réservoir (1) pour le confinement de l'eau à dessaler, dans lequel se trouvent un moyen de chauffage conçu pour provoquer l'évaporation de ladite eau à dessaler, un moyen de refroidissement conçu pour favoriser la condensation ultérieure de la vapeur et un moyen conçu pour collecter l'eau condensée, et est caractérisé en ce que : ledit réservoir (1), conçu pour contenir ladite eau à dessaler, est rempli jusqu'à un certain niveau (2); ledit moyen de chauffage, conçu pour provoquer l'évaporation de ladite

eau à dessaler, comprend un premier échangeur de chaleur (3) immergé dans l'eau à dessaler et positionné à proximité dudit niveau (2); ledit moyen de refroidissement (5a), conçu pour provoquer la condensation de la vapeur, est en liaison d'échange thermique avec le moyen de chauffage (5b) immergé dans ladite eau à dessaler, ledit échange de chaleur provoquant simultanément : a) la baisse de la température dudit moyen (5a), et par conséquent les conditions appropriées pour la condensation de la vapeur; b) l'augmentation de la température, dans les profondeurs, de ladite eau à dessaler.

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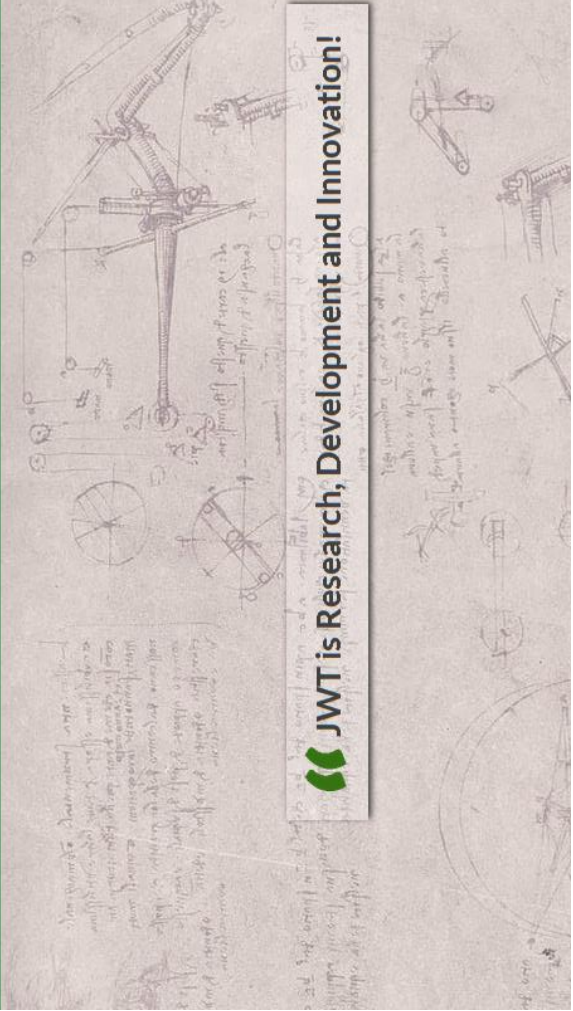
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Declaration of inventorship (Rules 4.17(iv) and 51bis.1(a)(iv)) for the purposes of the designation of the United States of America





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