

Harvesting Our Hope

Watermaker – SDGC toward SDGs/UN 2.1

(Target 2.1: By 2030, end hunger and ensure access by all people, in particular the poor and people in vulnerable situations, including infants, to safe, nutritious and sufficient food all year round).

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Chapter 1: The Barren Fields.

As Zhihao and Yanan reached the summit of the hill, a heavy sigh escaped Yanan's lips as she gazed upon the desolate landscape that unfolded before them. The fields, once lush and vibrant, now sprawled beneath the dying light of the setting sun, casting long, haunting shadows over the barren earth.

"Zhihao, our village and fields used to be full of life," Yanan lamented, her voice heavy with nostalgia.

Zhihao, his eyes scanning the transformed scenery, reminisced about their childhood adventures. "I remember seeing green color everywhere when we used to look down from here before."

As the sun dipped below the horizon, the landscape painted in shades of orange and purple, the two friends felt the weight of the years they had been away. Six long years spent studying and working in the city, oblivious to the gradual decline that had befallen their once-prosperous village.

"My mother used to tell me over the phone that the situation in the village was not good, but I was too busy

juggling between my job and my studies," Yanan confessed, regret lacing her words.

Zhihao nodded in understanding. "My parents used to mention it too sometimes. Maybe they didn't want us to worry too much and focus on our studies that's why they didn't clearly tell us that the village was drowning in poverty and withered crops."

The friends descended from the hill, stepping carefully over the uneven terrain that held memories of their carefree youth. They arrived at their neighboring homes, where both families gathered for dinner.

"Where were you guys? We were waiting for you," Yanan's mother inquired, a mix of concern and warmth in her eyes as she set the plates on the table.

"We went on the hill, like old times," Yanan replied, a wistful smile playing on her lips as she assisted her mother in setting the table.

Zhihao's mother emerged from the kitchen with a pot of steaming soup, adding to the comforting aroma that filled the room. "How was it climbing up again after so many years?"

"The sight was a lot different, Mom," Zhihao replied, a hint of melancholy in his voice as he filled bowls of rice for everyone.

"Zhihao, make sure everyone gets the equal amount. We only have this much rice left for the day," Yanan's father reminded him.

As they all sat down to share the modest meal, Yanan couldn't suppress her curiosity. "Why is our village suffering so much?" she asked her father.

"We relied too much on the rainfall for our crops over the years. There is no other source to irrigate our fields with," Yanan's father explained, the weariness evident in his eyes.

"Uncle, what about the river on the west of our village?" Zhihao interjected.

"We tried digging a small canal towards our fields to get water from it, but it was too polluted and salty because of all the new industries and factories that were set up around our village. Our crops withered because of it," Zhihao's father added to the conversation, the harsh reality of their village's struggles hanging heavy in the air.

"You guys should have let us know that the situation was

this bad," Yanan complained, frustration evident in her voice.

"It would have just made you worry about us and the village and distracted you from your studies, so we decided together not to tell both of you," Yanan's mother explained, offering a comforting pat on Yanan's back.

"This situation is out of our hands anyway; there is no solution to it," Yanan's father added, a sense of helplessness permeating each word.

"All of the children are malnourished now. It's been years since we had chubby children running around in the fields," Zhihao's mother remarked, her gaze fixed on the last bite of rice in her bowl.

Yanan sighed, her eyes reflecting the sadness that lingered in her heart. "Yes, I have noticed many children who are showing signs of malnutrition with their bellies hanging out and thin arms and legs like sticks."

As the family finished their meager dinner, Yanan and Zhihao took charge of the dishes while their parents settled down for some tea.

"Zhihao, we can't let our village suffer; we need to come up with an idea to solve this problem," Yanan declared as

she passed a wet bowl to Zhihao to dry and put in the cupboard.

"But what can we do? I'm sure all the elders of the village must have tried everything to solve this problem," Zhihao replied, his skepticism apparent.

"We didn't study all these years for nothing. We sure will find a solution. I'll find it," Yanan declared with enthusiasm, determination shining in her eyes.

"If you do find one, let me know," Zhihao brushed it off with a laugh, a mix of doubt and hope flickering in his eyes. The weight of their village's plight hung in the air, but in that moment, Yanan was determined to believe in the possibility of change.

Determined to make a difference, Yanan found herself immersed in the luminescent glow of her laptop screen, a lone beacon in the darkness of her room. The soft hum of the machine accompanied her late-night research, as she delved into the vast realms of articles and scientific studies, seeking a solution to their village's persistent water scarcity.

"There has to be something, some technology or method we haven't explored," she murmured to herself, her eyes

scanning through the digital pages in search of a breakthrough.

As the night unfolded, Yanan stumbled upon a technological marvel—the Solar Desalination Geoassisted Continuous (SDGC) device, affectionately known as the Watermaker. The description hinted at its revolutionary capability to efficiently desalinate water using renewable energy sources, a potential lifeline for their desolate village.

"This could be it! This could be the solution our village needs," Yanan exclaimed, a surge of excitement coursing through her veins as newfound hope kindled within.

With meticulous care, she transcribed the intricacies of the Watermaker onto paper, sketching diagrams and noting down key components. In the dim light of her room, she envisioned the transformative potential of this device, how it could bring life back to their withered fields and revive the spirits of the villagers.

The first rays of dawn painted the sky in hues of pink and gold as Yanan, fueled by both exhaustion and determination, gathered her notes. Clutching the promising information close to her heart, she hastened to Zhihao's house, eager to share the beacon of hope she had discovered.

"Yanan, what's gotten into you? Why are you here so early?" Zhihao, still groggy from sleep, greeted her as he settled down beside her.

Excitement radiated from Yanan as she handed over her meticulously crafted notes. "Look at this, Zhihao! I found something that could change everything."

Zhihao, though still in a state of half-consciousness, scanned through the notes and absorbed the essence of the Watermaker. The realization of its potential dawned on him, widening his eyes in astonishment.

"This is incredible. It uses renewable energy to desalinate water. It might just be the answer to our problems," Zhihao muttered under his breath, the weight of possibility settling in.

Yanan nodded with a triumphant smile. "I knew we could find a way. Now, we just need to figure out how to build it. It's your time to prove that all these years you didn't waste your time and actually did study."

"Of course I studied. How do you think I got a medal at the convocation?" Zhihao retorted, a hint of pride in his voice.

"But do you have the skills? Let's see," Yanan teased with a playful glint in her eyes.

“You sure will see.” Zhihao, engineering major, delved into the depths of the internet, scouring for the Watermaker's patent, studying its intricate mechanism and structure.

The ensuing day saw the duo immersed in a brainstorming session, blending Yanan's unwavering determination with Zhihao's technical expertise. Their collaborative efforts formed a powerful alliance against the challenges that had long plagued their community.

"We can't keep this to ourselves. We need to gather the villagers, tell them about the Watermaker, and work together to build it. We need all the help we can get," Yanan asserted a fervent glint in her eyes.

"Agreed. This could be the turning point for our village," Zhihao concurred, realizing the potential transformative impact of the SDGC, Watermaker, on their community.

Chapter 2: Together We Can.

Encouraged by their newfound discovery, Yanan and Zhihao felt an urgency to share their idea with their parents, recognizing that the humble living room would be the starting point for a potential transformation. The room was adorned with traditional tapestries, emanating a sense of familiarity, while the aroma of home-cooked meals lingered in the air, providing a comforting backdrop for a pivotal conversation.

"Mom, Dad, Zhihao and I found a solution to our water problem. It's a device called the Solar Desalination Geoassisted Continuous. Also known as the Watermaker." Yanan with a determined gleam in her eyes initiated the dialogue

Zhihao, eager to contribute, added, "It uses renewable energy to turn seawater into freshwater. We think it could revive our fields and bring prosperity back to our village."

"But, dear, do we even know if it will work? And how much would it cost?" Yanan's mother voiced her hesitation with her eyes reflecting both concern and curiosity.

"It's a risk, but we're already struggling. We might as well try something new. As for the cost, we can figure it out together." Zhihao's father, a figure whose resilience mirrored the struggles of the village, chimed in.

The room fell into a contemplative silence, the weight of their collective decisions palpable. After moments of introspection, the parents, whose faces carried the wrinkles of years spent in the village's challenges, agreed to support their children's audacious endeavor. With cautious optimism, they decided to present the idea to the entire village.

That evening, in the central square, the villagers gathered beneath the soft glow of lanterns, casting a warm ambiance on their curious faces. The elders, revered figures who held the wisdom of generations, were crucial decision-makers in the village. Elder Xiù Li, known for her nurturing spirit and unwavering commitment to the community, and Elder Guāng Wei, a respected voice of reason, were among them.

"Good evening everyone, Zhihao and I have been working on a solution to our water crisis. We believe the Watermaker can help us turn things around." Yanan addressed the villagers, her voice carrying the weight of hope.

"It uses renewable energy and can provide a continuous supply of freshwater. We want to build it here, adapt it to our needs, and bring life back to our fields." Zhihao, with a fervent passion, continued.

"Newfangled ideas don't always work. What if it fails? We can't afford to waste what little we have left." Elder Xiù Li raised concern her eyes reflecting a blend of curiosity and caution.

Yanan's father, embodying the determination of the village, responded, "I understand your concerns, but doing nothing is no longer an option. We're willing to take this risk, and we're asking for your support."

Amidst the deliberation, Lǐ Jùn, the hardware store owner, a stout figure exuding kindness, and Uncle Wang, the local mechanic known for his meticulous craftsmanship, overheard the conversation and stepped forward.

"I've been reading about this device online. If it can work for us, it's worth a shot. I'll contribute materials and tools from my store." Lǐ Jùn expressed his support.

Wang Liwei added, "And I'll lend my expertise in putting it together. We can make modifications to fit our village's needs."

Their willingness to contribute resonated within the gathering, signaling a shift in perspective. Lǐ Jùn and Uncle Wang, known for their invaluable skills, offered a tangible lifeline to the ambitious project.

Yanan stood before the assembled elders, her eyes reflecting a blend of determination and nervousness. Zhihao, with a technical diagram in hand, prepared to demystify the complexities of the Watermaker.

"Elders, we understand this may sound unfamiliar, but the Solar Desalination Geoassisted Continuous, or the Watermaker, is a proven technology. It harnesses renewable energy to convert water that's not suitable for the crops into freshwater." Yanan began describing the mechanism of the Watermaker in simple words for the locals to understand.

"Renewable energy? What does that even mean?" Elder Xiù Li was still skeptical.

"It means we use sources like sunlight or wind to power the device, ensuring sustainability. Let me explain." Zhihao replied.

As Zhihao delved into the technicalities, illustrating the diagram with a laser pointer, the elders listened with a mixture of curiosity and skepticism.

"This large tank here is the heart of the Watermaker. It holds the seawater earmarked for desalination. The first heat exchanger, powered by renewable energy, initiates the evaporation process near the tank's surface."

"Evaporation, you say?" Elder Xiù Li was nodding along.

"Yes, and here are stretched metal sheets above the water surface. They facilitate steam condensation during evaporation and engage in continuous heat exchange. This process helps generate freshwater." Zhihao pointed on his self drawn diagrams of the Watermaker to explain further.

"So, we get freshwater from that kind of polluted and salty water? Sounds like magic." A villager from within the crowd stated.

"It might seem like magic, but its science. And this science can revive our fields and bring prosperity back to our village." Yanan smiled.

As the explanation unfolded, the skepticism in the elders' eyes began to yield to a growing understanding. Zhihao continued detailing additional heat exchangers and the conveying system for collecting condensed water.

"These components work in harmony to optimize heat transfer and ensure efficient freshwater production. With

the right adaptations, we can make the Watermaker ideal for our village."

"It's a lot to take in, but you youngsters seem to believe in it. What do you need from us?" Elder Xiù Li folded her arms.

"We need your support, your wisdom, and your willingness to try something new. Together, we can make our village thrive again." Yanan took a deep breath before replying.

As the dialogues unfolded, the elders found themselves intrigued by the promise held within the intricate mechanism of the Watermaker. Yanan and Zhihao's persuasive explanations gradually transformed skepticism into a collective willingness to embrace this innovative solution.

Elder Guāng Wei, known for his discernment, nodded approvingly, "If this device can truly help us, we should give it a chance. The expertise of Lǐ Jùn and Uncle Wang will be invaluable in ensuring its success."

Elder Xiù Li, her nurturing gaze softening, added, "Our village has weathered storms before. This might be the lifeline we need. Let's trust our children and the wisdom of those offering their support."

With the elders lending their support, the collective nod of the villagers signaled a unified decision. Yanan and Zhihao, with gratitude and determination, realized that the journey ahead would be challenging, but the collaborative spirit of village had been reignited. The hardware store owner, Li Jun, and the mechanic, Uncle Wang, outlined their roles, showcasing the beginnings of a collective effort that would redefine the fate of their beloved village.

Chapter 3: Beyond the Obvious.

As the word spread through the village about Yanan and Zhihao's proposed solution using the Watermaker, a sense of cautious optimism spread among the villagers. The prospect of rejuvenating their once-fertile fields sparked a glimmer of hope. The next challenge was transforming this hope into a tangible reality.

The first hurdle was acquiring the materials needed for the Watermaker. Local hardware store was scoured for pipes, metal sheets, and other components. Mr. Lǐ Jùn, the owner of the hardware store, joined the cause, offering to source the specific material needed from the city through his sources.

The realization that a large-enough insulated tank for the Watermaker was elusive sent a wave of concern through the duo. Yanan and Zhihao furrowed their brows, their determined expressions momentarily clouded by the unexpected hurdle. The dream of revitalizing their fields now hinged on overcoming this seemingly insurmountable challenge.

The village square, usually buzzing with activity, fell into a thoughtful hush. Elders exchanged worried glances, and the youth, who had eagerly taken on various

responsibilities, exchanged concerned whispers. The hope that had kindled within them threatened to flicker out.

Amidst the uneasy silence, Uncle Wang, the elderly mechanic, emerged as a beacon of wisdom. His years of experience and resourcefulness had earned him the trust and respect of the entire village. With a determined gleam in his eye, Uncle Wang approached Yanan and Zhihao.

"Don't let this setback dampen your spirits, my children. There's always a solution if you're willing to look beyond the obvious." Uncle Wang patted both of them on their backs to lift up their spirits.

Yanan, her brow still furrowed, nodded in acknowledgment. Zhihao, though momentarily disheartened, looked up with a spark of curiosity in his eyes.

"But where can we find a large insulated tank in such short notice, Uncle Wang? It's crucial for the Watermaker to work efficiently." Zhihao's voice was tinted with worry.

"We have to think beyond our immediate surroundings. There's a small factory a few villages over. They might have something that could be of use." Uncle Wang stroked his almost silver beard which was the evidence of his experience.

Zhihao's eyes brightened with a glimmer of hope, while Yanan raised an intrigued eyebrow.

"A factory? Why would they have something like that?"

"Factories often have surplus materials or unused equipment. We won't know until we check. It's worth a shot." Uncle Wang said with a warm smile.

The trio decided to embark on a journey to the nearby village with the factory. As they walked through the fields and along winding paths, the villagers watched them with a mixture of anticipation and anxiety. The success of their endeavor rested on the outcome of this unexpected quest.

Upon reaching the neighboring village, the small factory came into view. Its weathered exterior and rusted sign suggested a business that had seen better days. Yanan, Zhihao, and Uncle Wang exchanged hesitant glances but proceeded nonetheless.

Inside the factory, the rhythmic hum of machinery filled the air. The smell of metal and oil lingered as they approached a man who seemed like someone with authority, a stout figure with grease-stained overalls which had a big tag over its write side of the chest, on it was written in big italic font "*Chief*".

"What brings you folks here?" his voice was deep and stern.

"We're from a village nearby; we're working on a project to bring water to our fields. We heard you might have an unused insulated tank that could help." Uncle Wang being the elder there started explaining the situation of the village and the details of their new venture.

The Chief's eyes were narrowed hinting his suspicion as he closely heard and analyzed every single word being said, but as Uncle Wang explained their plight, how their cultivation and production of food and economic stability have been effected because of unsuitable timings of the rainfall and polluted water, a subtle change softened his expression.

"Water to the fields, you say? Wait here." Chief said.

He disappeared into the depths of the factory, leaving Yanan, Zhihao, and Uncle Wang standing in the echoing silence. Moments later, he returned, pushing a sturdy insulated tank on a squeaky cart.

"We used this for a project years ago, but it's been collecting dust. If it can be of use to you, take it." Chief stopped the cart beside the trio and started catching his breath.

Yanan's eyes widened in disbelief, and Zhihao couldn't help but smile at the unexpected turn of events.

"Thank you, thank you so much! This means everything to us." Yanan's eyes swelled up with hope and gratitude grabbed the Chief's hands to convey her thanks to him.

"Just make sure you put it to good use. It's heartening to see young folks working for the betterment of their community." Chief lightly tapped on Yanan's hand accepting her gratitude.

As they wheeled the insulated tank out of the factory, the villagers who had accompanied them watched in awe. The unexpected generosity from the neighboring village not only provided a crucial component for the Watermaker but also reignited the flame of hope among the villagers.

Back in the village square, the triumphant trio, with the insulated tank in tow, was met with cheers and applause. Yanan and Zhihao shared grateful glances, and Uncle Wang, with a satisfied smile, addressed the villagers.

"Remember, challenges are just opportunities in disguise. Let's get back to work and make our Watermaker a reality!" Uncle Wang's spirit was matched by a roar of cheers from the crowd.

For several days Yahan, Zhihao and Uncle Wang worked alongside a group of young villagers to modify the tank, clean it and look for any nicks that needed to be repaired for it to be perfect for the Watermaker.

The unforeseen hurdle, which had momentarily cast a shadow over the village's aspirations, had now become a testament to the resilience and generosity that flourished within their community. As the village rallied around the acquired insulated tank, the collective spirit to overcome challenges burned brighter than ever. The journey to revitalize their fields continued, fueled by the unexpected kindness of a neighboring village and the unwavering determination of its inhabitants.

Chapter 4: Harmony in Struggle.

The realization that the village lacked appropriate materials for the crucial components of the Watermaker struck a chord of concern in Zhihao's heart. He furrowed his brow as he approached Yanan, who was overseeing the ongoing modifications of the tank.

"Yanan, we have another problem. We don't have enough suitable materials for the cooling sheets and heat exchangers. And the budget we have won't be enough to buy what we need in the city." Zhihao's words were full on worry.

Yanan, momentarily disheartened by this new obstacle, sighed. The weight of the responsibility they had shouldered for the village pressed down on them.

"We can't let this stop us. There has to be a way." Yanan sat down on the floor with her back against the wall in their made up workshop where the villagers used to come after doing their daily chores to put in their part for the Watermaker every day.

As they pondered, Yanan's mother, a skilled artisan, overheard their conversation. She approached them with a glimmer of an idea in her eyes.

“Zhihao my boy, tell me if we can use recycled metal sheets that old appliances have?” Yanan’s mother asked out of curiosity, since she was educated much about science or materials.

“Yes, we can I guess.” Zhihao was confused at the curiosity of Yanan’s mother.

"What if, in the meantime, we use recycled metal sheets from old appliances? The village has many unused or discarded home appliances. We can repurpose them for the Watermaker." Yanan’s mother stated her thoughts carefully.

Zhihao's eyes lit up with a spark of hope. It was an ingenious idea born out of necessity.

"That's a great idea! It not only solves the problem temporarily but also makes use of what we already have. Yanan, let's get started on this, and we can figure out the rest." Zhihao jumped up and hugged Yanan’s mother with a spirit of excitement.

Determined, they rallied the village youth, explaining the plan and enlisting their help in dismantling old appliances. The village square buzzed with activity as the youth worked together, transforming discarded metal sheets into potential cooling components.

With the makeshift cooling sheets underway, Yanan and Zhihao faced the challenge of the heat exchangers.

"We can design a simplified version of the heat exchangers using locally available materials. We don't need to spend much; we can make this happen." Li Hong, a young villager studying Mechanical Engineering, a junior to Zhihao in the University came back to his village after he heard from his mother about the new venture they were on, stepped forward.

Working closely with Zhihao, Li Hong sketched a design that considered the materials accessible in the village. This collaborative approach not only addressed the material shortage but also empowered the villagers, making them active contributors to the Watermaker project.

However, the budget constraint remained a hurdle. Zhihao and Yanan decided to take this concern to Li Jun.

"I can accompany you to the city. We might find more affordable options for the materials, and I can use my connections to get some discounts." Li Jun welcomed once again with open arms to help them.

With a newfound sense of determination, Zhihao, Yanan, and Li Jun boarded a bus to the city. The journey, accompanied by the hum of the engine and the rhythmic

motion of the bus, provided a backdrop for profound conversations.

"It's amazing how every hurdle becomes an opportunity for us to learn and grow. I never thought we'd be solving problems like this when we left for the city years ago." Zhihao stared outside the window.

"Life in the village has its own challenges, but it also has a unique beauty. We're not just solving problems; we're creating a future for our village" Yanan had a warm smile on her face as she gazed out of the window in the same direction as Zhihao.

"The spirit of our village and you two is truly inspiring. I'm honored to be a part of this journey with you." Li Jun, listening to their conversation, chimed in with a smile.

In the city, they scoured shops for materials, negotiating prices and finding cost-effective solutions. On their way back, the bus was filled not only with bags of acquired materials but also with a renewed sense of hope and excitement.

"I never thought a bus ride back to the village could be this exciting. We've got what we need, and with the recycled sheets, we can make this work." Zhihao struggled with creating some space for his legs with all the bags they

had to carry with them but still he couldn't keep his smile off of his face.

The bus rumbled along the familiar path back to village. The setting sun painted the sky with warm hues, mirroring the warmth and newfound hope that filled the hearts of Zhihao, Yanan, and Li Jun. The challenges were many, but the village's spirit was unyielding, forging a path toward a brighter future.

Despite their progress, skepticism lingered among some elders. The village council convened to discuss the potential risks and benefits. Elder Zhang, the village head, voiced concerns about the unknowns associated with the Watermaker. Yanan, with a stack of research papers, patiently addressed each concern, emphasizing the success stories of similar initiatives worldwide. Slowly, the skepticism began to wane.

The hurdle of manpower was overcome as villagers volunteered for different roles based on their skills. Uncle Li, a retired electrician, led the wiring and electrical connections. Aunt Zhang, known for her green thumb, took charge of planning the revived irrigation system. Each villager found a niche where their skills could shine.

The unity among the villagers became evident as they faced challenges together. Rainfall became both a blessing

and a hurdle during the construction. The villagers had to protect the exposed parts of the Watermaker from the sudden downpours, showcasing their adaptability in the face of adversity.

Every single day they were slowly getting closer to make their vision a reality by working together persistently. There was no one in the village that didn't play his part in building this new future for them. From children to young and from adult to elders they all had put their brick in the wall they were climbing for their better days to come.

Chapter 5: The First Drop.

The day of reckoning had arrived, draped in a blanket of nervous anticipation. The villagers, their faces were etched with a myriad of emotions, gathered around the completed Watermaker. Yanan and Zhihao, stood side by side, exchanged a glance that spoke volumes, a silent acknowledgment of the arduous journey they had embarked upon.

The sun hung low in the sky, casting a warm golden glow over the scene. The air buzzed with a mixture of excitement, hope, and a hint of anxiety. The completed Watermaker, a testament to the collective effort of the villagers, loomed as a symbol of potential transformation.

As the moment of truth approached, the villagers held their breaths. The rhythmic hum of the Watermaker echoed in the air, gradually building in intensity. Yanan's heart raced as she felt the weight of the village's expectations on her shoulders.

Zhihao noticed her momentary unease, whispered words of encouragement, "We've come a long way, Yanan. Whatever happens, we've given it our all."

The moment arrived, and the Watermaker roared to life. The intricate machinery, a fusion of innovation and determination, set into motion. Water began to circulate, and steam billowed, enveloping the air in a tangible sense of accomplishment. The once barren land now stood as a canvas for a potential renewal.

Tears welled in Yanan's eyes as she witnessed the Watermaker's success. The rhythmic hum echoed not just the operation of a machine but the heartbeat of a united community. It was a moment of shared triumph, a culmination of dreams and hard work.

Zhihao, placed a supportive hand on Yanan's shoulder, as he couldn't contain his pride. "We did it, Yanan. The village will never forget this day."

As the Watermaker produced its first droplets of freshwater, a collective cheer erupted from the villagers. The sound echoed through the hills, a harmonious melody of victory. The once barren land held the promise of a green future, and the village was reborn.

In the aftermath of the Watermaker's success, the impact on the village was profound. The fields, once parched and lifeless, now yielded bountiful crops. The days of rationing food were replaced by abundance. Villagers no longer worried about scarcity but reveled in the surplus,

enough to sustain themselves and contribute to the thriving farmer's market in the nearby city.

Children, once malnourished and frail, now thrived in the newfound prosperity. Their health improved, and the laughter of well-fed children echoed through the village. Schools flourished as students, no longer hindered by the shackles of malnutrition, and eagerly embraced their studies.

In the farmer's market, this very village's produce became renowned for its quality. The once struggling village transformed into a hub of agricultural success, drawing attention from neighboring communities. The economic revival brought a newfound sense of pride and self-sufficiency.

As the seasons changed, the fields blossomed into a vibrant community. The bonds among the villagers, strengthened by their shared struggle and triumph, formed an unbreakable thread. The Watermaker, born out of necessity, became a revered symbol of hope and resilience, a testament to what a united community could achieve in the face of adversity.

And so, in the face of adversity, the village found harmony in struggle. The echoes of their success resonated through the generations, a legacy of resilience, determination, and

the unwavering spirit that had brought life back to their village.

J W T

[joules water team](https://www.jwt-jwt.it/)
<https://www.jwt-jwt.it/>

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JWTeam

http://www.expotv1.com/ESCP_NUT_Team.pdf

*Offers extensive support on **Energy and Water Cycle**,
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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> (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>

Full Intellectual Property

http://www.expotv1.com/ESCP_Patent.htm

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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 .

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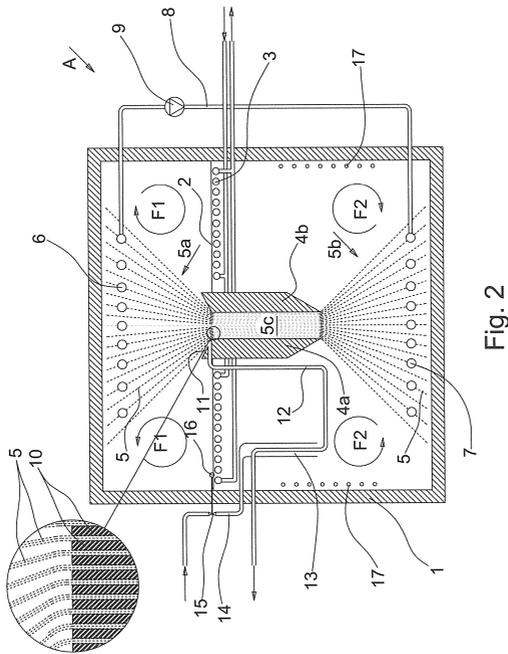


Fig. 2

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(54) Title (EN): METHOD FOR THE CONTINUOUS
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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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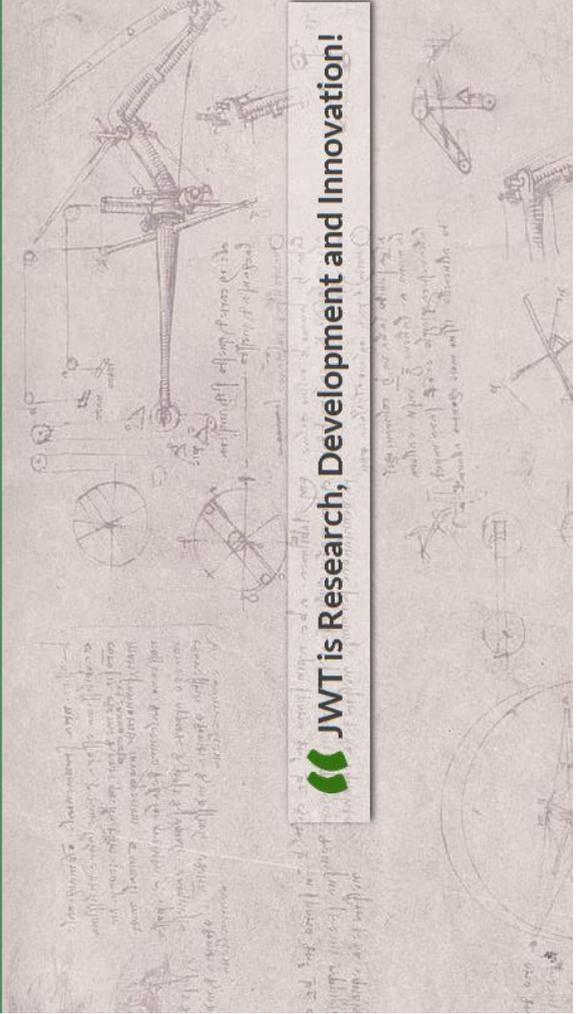
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Declarations:

Declaration made as applicant's entitlement, as at the international filing date, to apply for and be granted a patent (Rules 4.17(ii) and 51bis.1(a)(ii)), in a case where the declaration under Rule 4.17(iv) is not appropriate

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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