



"...For many years, I have spoken on how to practice in order to have sufficient and appropriate water supplies. The term of sufficiency denotes that there is enough water for consumption and varied applications, both in terms of household use as well as industrial and agricultural uses, which must have sufficient water supply. If there is insufficient water, everything will come to a halt, even the development that we are proud of in our nation. There can be no prosperity without water..."

> The royal speech delivered at the Dusidalai Hall, Chitralada Villa On 4 December 1993







GENESIS... PEOPLE SAVING WATER, SAVING LAND



Genesis... People Saving Water, Saving Land

The King's Philosophy is "A body of knowledge" that His Majesty King Bhumibol Adulyadej the Great bestowed on Thai people through more than 4,000 Royal Initiative Projects as a result of His Majesty's hard efforts in the development of the country throughout his reign, with over 2,000 irrigation projects such as water resource management, water retention, drainage, converting wastewater into clean water, etc. With Royal Initiatives to improve water supplies and irrigation systems, His Majesty prioritized the development and administration of water resources to address issues and relieve people's suffering caused by drought, overflow, or floods.

"Water" is the body of knowledge in the 1st dimension that His Majesty King Bhumibol Adulyadej the Great prioritized among 6 dimensions of the King's Philosophy, namely water, soil, agriculture, renewable energy, forests, and the environment.

Water is essential for the existence of all human, animal, and plant life, and there must be enough water, not more than required, and not less than necessary, in terms of utilization, consumption, agricultural and industrial uses, etc. as stated in His Majesty's speech delivered at Chitralada Villa on 17 March 1986, in one section:

GENESIS...PEOPLE SAVING WATER, SAVING LAND



"...The fundamental basis is that there must be water for drinking, usage, and cultivating since life exists there. People can survive if there is water, but cannot survive without water. People can survive without electricity, but they cannot survive if there is electricity but no water..." His Majesty King Bhumibol Adulyadej the Great fulfilled numerous royal duties around the country throughout his reign. His Majesty became aware of the concerns of the most people in the country who rely on "agriculture" and "water" for a living by visiting people and staying in different provinces.

In fact, since Thailand is situated in a tropical climate with abundant rainfall, it has a significant amount of water budget, including surface water and ground water; however without efficient water management, it will not be able to store the vast amount of water to be utilized effectively, along with the encroachment and destruction of watershed forest areas, causing the problem of drought and shallow ground water sources, water shortages, and competition for water resources. When the rainy season arrives, however, there is no natural wall to block the overflow of water, so the water rushes swiftly, inflicting harm to the nation, and increasing the likelihood that the situation would worsen. His Majesty considered the solution from the rainfall that fell to the land and how to manage the water for optimum profit by utilizing that water to help the people, whether in an area with so much water that it overflows or an area with so little water that there is a water scarcity.

His Majesty therefore dedicated himself to water resource research and development, bestowing water resource development projects, and addressing different water-related difficulties in order to enable people, particularly farmers, having a full and happy life.

Furthermore, one of the most important principles of water resource management is to understand problems and maintain balance with nature by **"Using nature to help nature"** by doing "Underground Irrigation" or "Adding water to the soil" such as digging Chicken's Gut Canal, making Retarding Basins (Monkey Cheek) Project, and another way to retain or add water to the soil quickly, in large quantities, cheaply, simply, and sustainably is "Building check dams." With His Majesty's intelligence and foresight, he began managing water resources in the northern region of the country first because it was the source of 4 major watersheds, namely the Ping River, Wang River, Yom River, and Nan River before converging to become the Chao Phraya River, which is Thailand's major river, as His Majesty King Bhumibol Adulyadej's Royal Speech addressed on 11 March 1989 at Doi Ang Khang, Fang District, Chiang Mai Province.

"...Check dams should be built along the river channels to help slow down the tide and store water to create humidity for the upstream regions..."

As a result, His Majesty has granted royal initiatives to public and private entities to assist manage the country's water resources, with the first priority being to enable agriculturists, farmers, and gardeners in remote regions can earn enough to live. His Majesty imparted the following working philosophy to multiple agencies in this regard: "Think carefully and thoroughly. If it is beneficial, it must be done with care, appropriateness, and fairness for maximum benefit and long-term sustainability."



His Majesty King Bhumibol Adulyadej the Great has launched the "Check dam" as an alternative and a significant mechanism for disaster relief both in times of flood and drought for more than 40 years. Check dams aid in the drainage, slowing and reducing the intensity of floods.

At the same time, it will assist in preventing the water from overflowing and wasting. In times of drought, this helps the residents have adequate water for drinking, usage, and cultivating. Furthermore, "Check dams" aid in the restoration of forest conditions, the suppression of forest fires, and the creation of humidity for the ecology around the check dam. When fertility occurs, there will be a supply of water, food, job creation, an income source, a learning source, and a tourism attraction in the region. These things will inspire affection and preservation, as well as local solidarity. Finally, as His Majesty said that "Building check dams is more beneficial than water," the residents who have left to work in the city will return to their hometowns.

His Majesty King Maha Vajiralongkorn Phra Vajiraklaochaoyuhua, like His Majesty King Bhumibol Adulyadej the Great, prioritizes water management through promoting the Royal Initiative Projects on water sources across the country, namely the Wang Kok Check Dam Construction Project with Water Transmission System, the Pang Khrai Royal Initiative Check Dam with A Water Transmission System locating at Wiang Pa Pao District, Chiang Rai Province, and the Royal Initiative Na Muang Check Dam Construction Improvement Project locating at Chae Hom District, Lampang Province, etc.

Furthermore, His Majesty wishes to continue and preserve His Majesty King Bhumibol Adulyadej the Great's Royal Initiative Projects aimed at addressing the issue of water management to the greatest extent possible for the welfare of the people by emphasizing the creation and improvement of water storage areas, such as building and improving check dams across all regions, building reservoirs, creating retarding basins (monkey cheeks), encouraging water management, and others by establishing these initiatives as an important mission to drive the country's strategy to alleviate the people's urgent problems of water shortage and flooding.

Over the past 70 years that the Port Authority of Thailand (PAT) has operated the business as the economic gateway for the country's import and export transported by waterway, which is similar to a downstreamer who has to rely on and use the Chao Phraya River in doing business since the organization's establishment until now.

All PAT executives and staff are now aware of the significance of the Chao Phraya River upstream region. As a result, they are committed to concretely conveying the downstreamers' obligation to the upstreamers in response to the royal initiatives of His Majesty King Bhumibol Adulyadej the Great and His Majesty King Maha Vajiralongkorn Phra Vajiraklaochaoyuhua. Furthermore, with the purpose of **developing**, **conserving**, **maintaining**, **and restoring** upstream areas so that they could remain with Thailand perpetually, we, PAT, jointly make a vow to be "**People...Saving Water**, **Saving Land.**"











ASPIRATIONS... DOWNSTREAMERS



Aspirations... Downstreamers

The "check dam" construction project has no a title of "check dam" yet, but can communicate the message entirely and clearly. Mr. Thanapong Jaisue, secretary of the People... Saving Water, Saving Land Project, wrote **"People... Saving Water, Saving Land"** to proclaim PAT's stance as a downstreamer who utilizes and benefits from the Chao Phraya River in business operations for 70 years since the beginning of Bangkok Port (Klongtoey Port) construction. PAT has been determined to return and be responsible for the Chao Phraya upstream areas.

"What should be done to provide water for drinking and use to the water-scarce Thai people?" The response is that we must assist one another in saving, and the term "Saving" indicates that we may do anything possible



to retain water and put it in a water jar, a bucket, or a basin. However, Thai people are fortunate to be the offspring of the Royal Father, thus we adhere to the Royal Philosophy. The building of check dams to retain water deriving from His Majesty' initiative becomes the phrase of People... Saving Water, Saving Land, which means that everyone on the land must contribute to water retaining." Mr. Thanapong said.

Operating Principle

The Operating Principle derives from the determination to carry on the Royal Wishes and follow in the Royal Footsteps of His Majesty King Bhumibol Adulyadej the Great's "Working Principles" on the issue of...

- ♦ Social Geography
 - Participation
- Maximum utilization

Social Geography

"...Any development must take into consideration the terrain of the area as well as the sociology of people's personalities and cultural traditions, which vary by location. We cannot compel people to believe differently. We need to introduce ourselves and

discover what people genuinely desire..."

Participation

"...His Majesty is a democrat who uses public hearings in management to allow all parties to express their opinions. His Majesty discusses the significance and consequences to all parties involved, including local community leaders. When the people in the area agree, the appropriate government agencies and alliances have been authorized to go forward with the royal initiatives to complete the project."



Save, simple and make utmost utilization

Regarding helping improve the lives of his people, **His Majesty uses simplicity and** economy to solve problems, allowing people to do things for themselves, by employing the resources that are available in the region to solve problems without high investment or implementing simple technologies, as a part of the Royal Speeches addressed,

"... to plant a forest without planting, allowing the trees to grow naturally to save budget..."

Based on His Majesty's working principles, the Project Management Working Group has adopted them as a model in their operations and the source of the working principles of "People... Saving Water, Saving Land" Project, that is, **giving what the people in the area want, participation of all sectors, both public and private, and creating maximum sustainable benefit under 3 pillars.**



Downstreamers who set out their determination to "Preserve upstream" Building check dams to restore water to the land for fellow countrymen to consume and use, as well as having a higher quality of life, demonstrates downstreamers' obligation to upstreamers.

Create a volunteer alliance to "Repay merit to the land"

Joining forces from all sectors, including the government, business, and public sectors, particularly the establishment of alliances with agencies operating businesses connected to the river, such as the Customs Department, Bangkok Shipowners and Agents Association,

the Customs Broker and Transportation Association of Thailand, shipping liners, etc. to demonstrate the power of downstreamers who adhere to the intention of working together

to keep upstream areas sustainable across Thailand.

3.

Inherit the King's Philosophy on "Building check dams is more beneficial than water"

To continue, maintain, and expand on projects originating from His Majesty King Bhumibol Adulyadej the Great's efforts and initiatives in producing a greater well-being for the people through the construction of check dams in accordance with the King's Philosophy. In addition to storing water for consumption and use, solving drought problems, reducing flooding, forest fires, landslides, and assisting in the creation of a complete ecosystem, building a check dam also helps create love, unity and bonding for local residents to return to love their homeland, creating jobs and careers, and being a sustainable tourist attraction, as the King Rama IX stated,

"Building check dams is more beneficial than water."



Operational Methods

Search for and gather information related to impacted areas.

In each fiscal year, the working group begins to study and gather information on upstream areas that are experiencing water shortage problems, flooding, drought, forest fires, mudslides, and so on, from various communication channels such as TV news, newspapers, social networks, or even direct information from the PAT personnel who have seen and told about it or from the site owners who made a letter asking the PAT about financial assistance, etc.

2. Select based on the project's criteria.

The working group explores choosing an area based on the following criteria: being the Chao Phraya River upstream area in the Northern provinces, being urgently required and suffering from water difficulties, as well as having preparedness, collaboration, and strength of community leaders and people in the community. If it fits these conditions, PAT will give it priority consideration.

However, there may be numerous areas that meet the requirements, in which case the



working group must carefully collect all of the information and assess the area again.

3. Survey the area

The working group travels to pre-selected areas to attend meetings or community meetings with government agencies in the area, such as Chief District Officer, Chief Executive of the SAO, Sub-district Headman, village headmen, government officials, soldiers, officers of the Royal Forest Department and Royal Irrigation Department, as well as community leaders, teachers, monks, and people in the area, and so on, to present projects and discuss various issues, including problem situations, real needs, community culture, regulations, laws, methods for obtaining permission, as well as readiness in matters such as labor, locations, local-materials, etc., as well as listening to comments and suggestions from meeting participants to create mutual understanding and to ensure that the operation proceeds smoothly for the utmost benefit. Following the meeting of the working group with representatives from government agencies, check dam teachers and local residents will explore the surrounding area to determine the suitability of the area,

determine the check dam construction sites, plan and evaluate the preliminary method of check dam construction, including setting the time frame, studying the advantages and restrictions of the areas, etc.

4. Consider a site selection

One week following the site survey, the working group analyzes the findings and create comparison data analysis for each area to submit to the meeting for choosing the "Check dam building site" for the fiscal year. The check dam building sites must be chosen in compliance with the following criteria:

- Hospitality and attentiveness of the site owners;
- State of scarcity;
- Readiness and cooperation of related agencies in the area;

** If there is community preparation, collaboration, and commitment in the form of a Bor Wor Ror (home, temple, school) in the area, it would be receiving special consideration.**

- Characteristics of community leaders;
- Population;
- Number of check dams required;



- Suitability of the construction site;
- Primary occupation of the local residents;
- Local materials
 (bamboo, rocks, soil, sand, etc.);
- Budget;
- Primary person responsible for construction, etc.

Once it is determined that the check dam will be constructed in any area, PAT

organizes an official check dam handover ceremony by selecting the most appropriate site to represent all areas and to symbolize the check dams handover each year. For instance, in 2020, PAT built 9 check dams in Laplae District, Uttaradit Province, Wang Thong District, Phitsanulok Province, Ko Kha District, Lampang Province, Mae Ai District, Chiang Mai Province, Chiang Saen District and Chiang Khong District, Chiang Rai Province, but the Working Group has resolved to select Ko Kha District, Lampang Province as the one site for the official check dams handover ceremony.

The following criteria will be taken into the consideration when the decision for conducting the check dam handover ceremony is made:

 Government agencies, community leaders, and residents in the area are prepared, united, and willing to sacrifice;

• The primary coordinator is responsible, enthusiastic, and generosity;



• The site's appropriateness, such as its capacity to accommodate a large number of ceremony participants, abundant forest areas, agricultural commodities and recreational tourist attractions; and

Interesting local identities or traditions
 i.e. sticky rice alms giving ceremony, forest
 ordination ceremony, and so forth.

5. Notify the selection results and budget support

After the unanimous resolution is passed at the working group meeting, the secretary notify the selection results to the site coordinators for the site owners to prepare a draft plan, guidelines, methods, timeframes for the check dam construction and report back to the working group for consideration. After that, the working group allocate the budget based on the amount actually required, taking into account the number of check dams, the size of the check dams, the area restrictions, etc. However, the budget is made up of 2 parts: PAT's budget and the assistance of the alliances.

6. Construction of the check dam under "People... Saving Water, Saving Land" Project

According to the King's Philosophy, the check dam pattern that PAT has adopted as a standard form of the "People... Saving Water, Saving Land" Project is stable, strong, attractive, and functional.

Since the first meeting on the site, the working group has always focused on

creating an understanding of the principles and processes for all areas by displaying photos of "Examples of check dams." For areas that are ready in terms of knowledge, community leaders, labor, budget, local materials, etc., check dam building may be carried out immediately in the manner of local residents' collaboration. We only construct check dams with the unifying of local residents. There is no contract labor in any form because when



people engage in the work to help construct the check dams together from the start, they will understand the significance of their check dams and will love and embrace them.

However, in areas where people lack knowledge or skills in building check dams, PAT will invite check dam teachers or nominate PAT's personnel (those who have passed the upstream check dam training course from the Huai Hong Krai Royal Initiative Developmental Study Center) to help transfer knowledge from real experiences and build the check dam properly according to the King's Philosophy.

When certain areas of a huge check dam demand a lot of labor, the site owner will request for support from volunteer residents in adjacent districts to serve as supplementary labour. Simultaneously, the working group will ask for PAT's volunteer personnel to assist the residents to construct the check dam. Those volunteers must remain in the area from start to completion.

During the construction of the check dams in each area, the working group will regularly keep in touch and coordinate with the site owners via various contact channels such as telephone, LINE, Facebook, e-mail, or even traveling to the area in person to follow up on progress as well as acknowledging and solving obstacles during the construction process. This makes people in the area confidence that PAT and alliances are not simply handing over budgets and leaving. On the contrary, from start to completion, every stage of the project is monitored, and has never been abandoned.



7. Meet with the Provincial Governor

After determining the date, time, and location for organizing the check dam handover ceremony, the working group, along with the district chief, the sub-district headman, the community leader, and representatives of local residents, invite the Governor of that



province to preside over the official check dam handover ceremony on the day specified by PAT. There are also notifications on the "People... Saving Water, Saving Land" Project's check dam construction activities to enable the Governor, as the City Governor, to acknowledge the history and objectives, as well as the unity and determination of the residents who jointly build the check dams and retain water for the land.

8. The Check Dam Handover Ceremony

Since the "People... Saving Water, Saving Land" Project is chosen to commemorate His Majesty the King on the auspicious occasion of his Coronation. As a result, the check dam handover ceremony is celebrated in July each year to commemorate the auspicious occasion of the Coronation Ceremony.

Two days before the event, the working group travels to prepare the site in various aspects such as formal procedures, activity forms, event sites, vehicles, food, number of participants, traveling methods, traffic, recreational activities, installation of stages and signs, educational exhibitions, queue rehearsals, and so on. At each stage, the working group meets and visits the event site together with the district chief, sub-district headman, village headmen, community leader, locals residents, and others engaged. In which participants from different areas and sectors jointly expressed their thoughts and work together to so that the event is neatly honorable organized and impresses all parties involved.

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Smiles, conversations, and traveling to the ceremony since the morning might demonstrate that it is a day when the residents are pleased and hopeful and that there is a future from "Check Dam" that everyone is about to get.

Additionally, PAT must organize meritmaking ceremonies and religious ceremonies according to local traditions in every site where check dams will be handed over, such as sticky rice alms giving ceremony, forest ordination ceremony, which is like notifying and asking permission from the sacred things of the area and for the prosperity of the ceremony participants.

Every year, about 100 people attend the official check dam handover ceremony, including the Provincial Governor, the PAT executives and officials, representatives from relevant organizations and alliances, a chief district officer, a sub-district headman, a village headman, community leaders, government agencies and private sectors involved, and local residents, as well as members of the media. The ceremony orders start with paying respects to Their Majesties the King and Queen's Royal



Portrait. Then the Provincial Governor, as the ceremony's chairman, will then take over the project's check dams from the Director General of PAT and hand on them to the Chief District Officer in charge of the site. Following that, a project commemorative T-shirt gifting ceremony will be held to express thanks from the hearts of downstreamers.

PAT not only builds check dams for the people, but it also generates an abundant ecosystem for them. PAT often conducts concrete formwork is not the final step of the

activities such as releasing fish, releasing frogs, and planting trees along with handing out check dams in every area as a starting point for creating balance for nature. That is, after the water in the check dams has released enough humidity into the subterranean, the environment surrounding the check dams will be plentiful, with lush forest areas, agricultural products growing seasonally, fish in the water, rice in the field and living creatures living in nature's balance. Local residents working together to develop and maintain them will be able to produce enjoyment, benefits, careers, and revenue for this area in a sustainable manner. If a check dam handover ceremony is held near the school in any lucky year, PAT will not miss the opportunity to organize joyful activities for students such as playing games, singing, handing out presents, giving educational support equipment, making friendly football matches with the teachers, and offering a special luncheon for the children.

9. Follow up the success

Pouring concrete or taking off the

"People... Saving Water, Saving Land" Project's check dam construction, but our ultimate happiness is to settle down and wait for the rainy season to arrive for the residents to send pictures and a signal of happiness confirming that the project's check dam helps create happiness and alleviate suffering

during disasters by communicating through the "People... Saving Water, Saving Land" line group until we are sure that the "Check dam" has carried out its responsibilities with integrity and for the greatest benefit to the villages, both directly and indirectly.

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From the fiscal year 2016 until the present, the "People...Saving Water, Saving Land" Project has effectively operated with a total of 80 check dams, encompassing upstream areas in 9 provinces and 20 districts.

Fiscal Year	Upstream Areas	Number of Check Dams	Total Number of Check Dams
2016	Laplae District, Uttaradit Province	3	3
2017	Li District, Lamphun Province	6	18
	Tha Pla District, Uttaradit Province	7	
	Thongsaengkhan District, Uttaradit Province	3	
	Den Chai District, Phrae Province	2	
2018	Mae Ai District, Chiang Mai Province	3	10
	Long District, Phrae Province	7	
2019	Ko Kha District, Lampang Province	2	11
	Laplae District, Uttaradit Province	2	
	Phichai District, Uttaradit Province	6	
	Mueang Uttaradit District, Uttaradit Province	1	
2020	Ko Kha District, Lampang Province	2	9
	Laplae District, Uttaradit Province	1	
	Wang Thong District, Phitsanulok Province	1	
	Mae Ai District, Chiang Mai Province	2	
	Chiang Khong District, Chiang Rai Province	2	
	Chiang Saen District, Chiang Rai Province	1	

ASPIRATIONS...DOWNSTREAMERS

Fiscal Year	Upstream Areas	Number of Check Dams	Total Number of Check Dams
2021	Rong Kwang District, Phrae Province	2	17
	Ban Khok District, Uttaradit Province	1	
	Laplae District, Uttaradit Province	2	
	Phichai District, Uttaradit Province	1	
	Nakhon Thai District, Phitsanulok Province	3	
	Thap Khlo District, Phichit Province	3	
	Mae Ai District, Chiang Mai Province	1	
	Chiang Saen District, Chiang Rai Province	1	
	Doi Luang District, Chiang Rai Province	1	
	Ko Kha District, Lampang Province	1	
	Tha Song Yang District, Tak Province	1	
2022	Doi Tao District, Chiang Mai Province	1	12
	Chiang Saen District, Chiang Rai Province	3	
	Rong Kwang District, Phrae Province	2	
	Laplae District, Uttaradit Province	2	
	Phichai District, Uttaradit Province	2	
	Nakhon Thai District, Phitsanulok Province	2	
Total			80



"In the middle of 2022, I had a chance to participate in the construction of check dams in the Chiang Saen District, Chiang Rai Province, which is the district where Chiangsaen Commercial Port is situated. At first sight, I saw the assistance and collaboration of downstreamers and upstreamers without revealing their ranks, positions, or cohorts. Everyone had **the same mission of delivering water to the residents to consume and use**, so I could only see their smiles and happiness. Furthermore, I am delighted to learn that check dams help retain water for the community, avoid floods, decrease flood catastrophes, and enhance the quality of life for the residents. My staff and I are proud to follow the King Rama IX's intention until we see the achievement that more than 80 check dams throughout the northern area today are the result of the success that was created by two powerful small hands of upstreamers and downstreamers who want to retain water and return Thailand's favor."

> Mr. Kriengkrai Chaisiriwongsuk Director General of the Port Authority of Thailand



Awards of Pride, Awards of the People... Saving Water, Saving Land

The "People...Saving Water, Saving Land" Project won the Asia Responsible Enterprise Awards (AREA) 2022 in the Social Empowerment Category, which was hosted by Enterprise Asia, a leading NGO that promotes the potential of socially responsible agencies and entrepreneurs in Asia. The award in the Social Empowerment Category recognizes Asian organizations that have demonstrated remarkable social responsibility in promoting the stability and unity of communities and societies in a sustainable manner.











TREATISE ON... CHECK DAM BUILDER



Treatise on... Check Dam Builder

The content that will be read from now on is a compilation of true information that the author "interviewed" with one person and meticulously transferred into a "Treatise" or a manual for individuals interested in the King's Philosophy of Check Dams Construction. This chapter is "the Book Core" including academic knowledge and experience beyond the textbook that "He" has gained about "Check Dams Construction" throughout his life.

Lieutenant Peed - "Lt. Boonsom Janped", like all readers, is a regular person born in Thailand as an inhabitant of the King. In one lifetime of "him," he saw "the truth," and pledged to himself that he would not definitely allow such a thing to happen to Thailand.

"I once served as a soldier on a mission in Sudan. When I arrived at the 'Super Camp,' the United Nations (UN)-provided tent, a huge tent where troops from many countries resided together while waiting for the time and aircraft travelling to the destination. While heading inside the accommodation, I met and spoke with a senior soldier who was returning to Thailand since their mission in that shift had come to an end. Senior handed me two 1.5-liter water bottles and told me to keep them properly because they will come in handy later. I still didn't understand what senior meant at the moment, but I didn't ask any additional questions and kept the water bottle.
... The commander told the soldiers one morning to carry a container to wait for water for daily usage. When I heard the order, I wondered in my heart, "Who would have prepared an empty bottle? "

Suddenly, I recalled my senior's water bottle, so I hurriedly picked up the water bottle and stood in line. Thank you very much. I survive...but I'll always be thankful to that senior in my heart. In this situation, two bottles of water are really handy. So I use water wisely and carefully, especially when I wash my face, brush my teeth, wipe the body, go to the bathroom, and so on. My experience at the time was a turning point in my life.

What should I do if Thailand runs out of water and becomes arid like Sudan?

As a result, I made a resolution that if I returned to Thailand, if there is any job related to water and forests, I would do my best for the sake of Thailand."

So, when I returned to Thailand, what Lt. Peed intended to do happened...when the commanding officer (3rd Engineer Brigade) ordered me to assist in the construction of check dams in Noen Maprang District, Phitsanulok Province. At the time, Lt. Peed had a meeting with Professor Petai Prathumthong, the Director of the Royal Initiative Check Dam Construction and Vetiver Grass Planting Projects. Noen Maprang Check dam was the first check dam constructed. When Professor Petai commanded me to do anything, I was simply a handyman. Working with Professor Petai has



taught me a lot, particularly about the transfer of concepts and ideologies.

Until 2016, the PAT working group traveled to Laplae District to meet Mr. Thatri Boonmark, Laplae District Chief at the time, Professor Petai, a community leader, and residents to discuss about the check dam construction in Mae Phun Sub-district, Laplae District, Uttaradit Province, and that was the start of the meeting between PAT and Lt. Peed.

"People...Saving Water, Saving Land" Project Construct "Check dam" to retain, trap, slow down, humidify, enhance and preserve.

Retain

It is a water reservoir like a small water reservoir scattered throughout the area for local residents to use, consume and cultivate.

Trap

Trap sediment in front of the check dam to keep it from flowing and causing the lower river to become shallow, allowing residents to take advantage of clean water to consume and use.

Slow down

Slow down the water flow, reduce the strength of the stream, minimize damage caused by a flash flood or cataract, and reduce the severity of floods, mudslides, and other natural disasters.

Humidify

Create humidity and disperse it across a large region. It replenishes subterranean water, undergroundwater, and shallow wells. It also contributes to forest fertility and provides a fire protection line known as wet forest.

Enhance

Enhance the variety of ecosystems so that aquatic creatures and wildlife can exist with water and a food supply.

Preserve

When there is water and abundant forests, people in the community have a source of food, occupation, and revenue, causing the community residents love, be happy, and preserve natural resources.

There are 3 types of royal initiative check dam as follows:

Local Check Dam

On the upper part of the forest areas, a check dam (preliminary local upstream check dam) is constructed. This check dam is built simply according to local knowledge, utilizing natural resources such as tree branches and fallen timber flanked by stones in different sizes for the sole purpose of slowing down water and humidifying the environment. This type of check dam requires very little or no construction cost. Only labor is utilized, and the service life is around 1-2 years. The check dam may be built in a variety of methods, including timbers bordered by stone, as well as by simply placing stones and weaving bamboo, etc.

Semi-permanent Check Dam

The semi-permanent check dam is a kind of check dam utilized in the "People...



Saving Water, Saving Land" Project that is built of natural materials combined with construction materials including bamboo, stone, sand, and concrete. It is sturdy and capable for withstanding the intensity of the water in the stream on moderate to steep slopes. Typically, after investigating the majority of the semi-permanent check dams, it was discovered that there were no grooves in the check dam axis and no wall along the river bank (Elephant Ear/Hoochang). However, as for the project's semi-permanent check dam, local natural materials, such as **reinforced bamboo in the concrete**, are still used, as well as

grooving the check dam axis, building the wall along the river bank (Elephant Ear/Hoochang), and reinforcing the area extending beyond the wall (Duck Feet/Teenped) to absorb the impact strength of water mass. As a result, the check dam under the **"People...Saving Water, Saving Land" Project** may be considered a semipermanent check dam, although its stability and strength is close to a permanent check dam with a service life of more than ten years (depending on maintenance).

Permanent Check dam

A permanent check dam, also known as a reinforced concrete check dam, is sturdy, robust, and resistant to water erosion. This sort of check dam must be properly developed by professionals with firsthand knowledge and expertise in check damconstruction with a service life of more than 10 - 20 years.

Check dam construction method

Check dam construction under the "People... Saving Water, Saving Land" Project is derived from learning according to the theory of building a sufficiency check dam on His Majesty King Bhumibol Adulyadej the Great's initiative, combining with the learning from check dam teachers and working group experiences. As a result, the project's check dam construction process, which everyone will learn at the same time, may be seen as a combination of sophisticate strategies derived from direct experience and uniqueness in the particular form of the "People... Saving Water, Saving Land" Project.



Components of the check dam are

1. The Axis of Check dam

"Bamboo" is used as a structure of the check damin the "People... Saving Water, Saving Land" Project. The check dam axis is composed of concrete and contains huge stones from the surrounding areas as components. The check dam axis is the most vital component of the check dam. For the check dam to be strong stability, the standard check dam must be penetrated the check dam axis to a depth of 1.5-2 meters or deeper to the original soil layer. The check dam axis will serve to support the impact of water and prevent water passing through at the surface level.

(Duck Feet/Teenped)

Duck Feet/Teenped is located on both sides of the front and back of the check dam. Its structure is made of bamboo cast with concrete to keep the river bed strong and prevent water from entering and destroying the check dam axis. When the water is strong and fast, the front of the area extending beyond the wall (Duck Feet/Teenped) acts as an erosion force resistant, while the rear of the Duck Feet/Teenped absorbs the impact of the water overflowing from the check dam. When the water is strong enough, it will overflow the check dam and hit the soil surface directly in the river bed if the check dam does not have the Duck Feet/Teenped. Following that, the water will erode the soil surface until it becomes hollow and sink underground, destroying the check dam axis and ultimately damaging the check dam.

3. The wall along the river bank (Elephant Ears/Hoochang)

It is like the chief soldier of the check dam. The location of the wall along the river bank (Elephant Ears/Hoochang) will surround

2. The area extending beyond the wall the check dam on all four sides. It is responsible for supporting the river bank and strengthening the check dam, as well as absorbing the impact of water from all directions. If there are none of Elephant Ears/Hoochang, the water will directly strike the check dam axis. This will cause the banks on the side of the check dam to collapse and cause the current to change direction easily. If the check dam is to be erected in a position where the water flows fast and powerful, the size of the Elephant Ears/ Hoochang should be extended and reinforced to maximize the capacity of avoiding bank erosion on the side of the check dam.

4. Control Arm (Bird Wings/Peeknok)

It is the section that joins the check dam axis on both the right and left sides. It is in charge of controlling the flow of water along the overflow. It is similar to a bird's or a raven's wings that embraces the water to keep it from spilling out on either side or overflowing on both sides of the bank, which might cause harm to the residents' houses or agricultural areas.

5. Spillway

The spillway will assist manage the water level in the check dam to a safe level

by releasing excess water to the check dam's terminus, preventing the check dam from overflowing.

In summary, these 5 components of check dam will execute their primary responsibilities and support to other components to help the check dam stay strong, stable and last longer.

Check dam construction process

Check dam construction of the "People... Saving Water, Saving Land" Project consists of the following steps:

 Determine the area to build a check dam.

The most important factor in determining a check dam construction site is to consider the needs of the local residents. As a result, it is the origin of the working group's survey of the area before beginning construction of the check dam every time. (See details in Chapter 2: Operational Methods.) The working group will meet local residents and relevant agencies from all sectors to introduce the project, create understanding, solicit feedback, and reach decisions about the check dam construction site. Every time, the working group will offer local residents the chance to propose the location that they believe is the best. "Residents have to stay with the check dam, make use of this check dam every day. They are more knowledgeable about this subject than we are. They may proceed if they are comfortable with it. However, the team must examine whether or not the proposed location meets the requirements. The proper ones can be made and will not cause difficulties with them later", a check dam teacher said.

The following are the criteria for determining a project's check dam construction site:

1. To build the check dam in the area's natural waterways. The project's check dam will be erected in plain or low-slope terrain because they can hold more water than highslope terrain in forest areas. Furthermore, most of the residents who now live in plain terrain would be able to use water directly without disturbing forest areas;

2. The check damconstruction site should be in a position of holding enough water in front of it, which must be a plain or low-slope terrain. If the check dam is built on a steep slope, the water will flow down swiftly by gravity, resulting in less water storage area. Furthermore, since the river will bring silt down to accumulate at the front of the check dam easier than on a plain or low-slope terrain, the check dam will become shallow rapidly. If the check dam must be erected on steep slopes, it should be built more often to maximize the efficiency of conveying huge volumes of water;

3. To build the check dam in the narrowest point of the creek, or bulb point, it will reduce human labor and reduce the construction cost and if there is a wider swamp or pond, the more water retention volume is increased too;

4. To build the check dam in a location with original soil conditions or aging soil for strength and the capacity to absorb water shocks, and avoid building the check dam in areas where the ground is loose, sandy, or has not yet naturally adhered;

5. The check dam construction site should have a high enough creek bank on the check dam's side to avoid floods and erosion of the river bank into a new channel; 6. To build the check dam in an area with entire bamboo clumps or mature trees to assist lessen effect and keep the check dam stable. If you create the check dam in a location where the trees are not completely grown, the tree roots will grow down to the chine and break the check dam; and

7. To prevent water from overflowing and causing difficulties in the nearby communities, ensure that the height of the check dam being built is not higher than the level of the banks on both sides.

Avoid:

• Building a check dam in an area where a river or a side bank has been eroded or collapsed because it indicates that the water flows very strongly and rapidly. If built in that area, the check dam may easily collapse.

• Building a check dam in the water curve region owing to the strong impact of the water on the curve causes the water to forcefully strike the check damand it will easily collapse.

2. Grade the area

Once the check dam construction site has been determined, we must start to adjust the area by dredging mud, muddy soil, clearing weeds and grading the topsoil to be even, etc., in preparation for digging a trench for the check dam axis.

3. Dig the check dam axis

The check dam axis must have a width and depth of about 1.5 - 2 meters or dig down to the original soil layer. The length of the check dam axis is equal to the width of the creek. Workers or backhoes can be used to dig a trench for the check dam axis.

4. Build the axis of the check dam

4.1 To make a check dam axis structure, cut a 1.5-2 inch diameter bamboo trunk;

4.2 Stick bamboos vertically at a distance of 20-30 centimeters and slantingly stick bamboos on the sides of the check dam;

4.3 Tie bamboo in 3 dimensions (vertical, horizontal, and transverse) using ropes at check dam axis, Control Arm (Bird Wings/ Peeknok), and spillways;



4.4 Drainage pipe and sediment drains should be installed with 2 or more 10-inch pipes. Sediment drains should be installed on the concrete floor or the area extending beyond the wall (Duck Feet/Teenped). The drainage pipe should be elevated slightly above the sediment drain.



5. The wall along the river bank (Elephant Ears) and the area extending beyond the wall (Duck Feet/Teenped)

Making the wall along the river bank (Elephant Ears) to avoid river bank erosion and the area extending beyond the wall (Duck Feet/Teenped) to lessen water impact. Use bamboos continuously tie in a 2-dimensional wire mesh style of 20-30 centimeters or tie in line with the check dam axis.

6. Cover the concrete formwork

Covering the check dam side structure with plywood or plywood replacement materials, such as steel plates, old tiles, etc., to prepare for concrete pouring. Its purpose is to control the flow of concrete along the covering plank. In this regard, the plank covering the concrete formwork must be robust, leakfree, have a smooth surface, not absorb cement

water, and always have supporting crossbars, since it will create pressure when pouring concrete. If the plank covering the concrete formwork is not strong enough and without the supporting crossbars, it will bulge or flex, allowing concrete to seep out and deform the check dam.



7. Pour concrete according to the concrete formwork

It is usually required to bleed air from the concrete during concreting by manually pushing it until reaching the end of the thickness of the concrete layer being poured, tapping the formwork sides with a hammer, using a concrete shaker, and so on. Before pouring the next layer of concrete, the concrete in each layer should be compacted so that all layers of concrete connected each other homogeneously, without holes or air spaces, with a smooth surface that is sturdy and long-lasting.

8. Takeoff the concrete formwork

After the concrete has been poured, we must wait for it to dry and harden for approximately a day before removing the concrete formwork and plastering it for decoration.



Further Development

The "People... Saving Water, Saving Land" Check dam's "Stability, Strength, Attraction, and Functional Use" are the outcome of the execution of sustainable development guidelines, which are initiatives, implementation, and further development.

Initiatives – To visit the check dam construction sites for creating understanding, engagement, and ownership of the "check dam" together.

> Implementation – To think, build "Check dam," and work together to address any issues.

Further Development – To increase potential and discover approaches to be self-sufficient, as well as preserving the integrity of "Check dam" for the future generation. However, further development will vary based on each area's knowledge, competence, and appropriateness.



1. Personnel knowledge development

1.1 PortAuthority of Thailand (PAT)'s personnel: The "People...Saving Water, Saving Land" Project has been chosen as an Honored Initiative for His Majesty the King's Coronation in 2019-2020. Furthermore, the PAT's staff, as downstreamers, are firmly determined to keep the upstream areas connected with Thailand perpetually. Additionally, in order to secure the project's long-term success, the PAT intends to develop and educate the PAT's personnel in the King's Philosophy of check dam construction and water resource conservation and development in a methodical and accurate way. This may continue to convey the body of knowledge and be a powerful force for the organization.

1.1.1 Training

Nominating the PAT's personnel to attend training course titled "The Royal Initiative Upstream Check dam for Ecological Restoration of Watershed" at Huai Hong Khrai Royal Development Study Center, Doi Saket District, Chiang Mai Province, which is a center for training and disseminating education to find different development models, in particular, the development of upstream areas for government agencies and general agriculturists.

1.1.2 Implantation

Appointing the PAT's staff to accompany a team of check dam teachers as they travel to build check dams in various areas to learn techniques and gain experiences



directly from the check dam teachers, such as location selection techniques, check dam construction method, and the topography, as well as learning about immediate problems solving, community relations, encouragement, negotiation, analysis, and decision making, etc.

1.2 Local personnel: The "People... Saving Water, Saving Land" Project commenced in 2016 at Laplae District, Uttaradit Province. From an area that used to be plagued by forest fires and mud - slides, destroying over 200,000 rai of residents' agricultural land, Laplae people have recuperated their life, have a supply of water, a job, income, and smile again. The delight coming from the solidarity of the residents who have been through hard times leads them to join forces to construct and develop water reservoirs in their own areas with financial assistance from the PAT.

According to Mr. Damnoen Chiangphan, the Chairman of the Community Water Management Committee of Mae Phun Sub-district, Laplae District, Uttaradit Province, "The happiness and success of the check dam will always be with the Laplae people because after this, the leaders have prepared to transfer their knowledge and develop their potential to learn about check dams, as well as cultivating the consciousness of soil, water and forest conservation for the new generation of volunteers and working-age people in Mae Phun Sub-district, Laplae District. The cultivation process starts from enable them to help build check dams." The "establishment of a Community Water Management Committee" is a personnel expansion in the region of the case study of Laplae District, Uttaradit Province.

The committee consists of leaders with knowledge and experience in the development of community water resources, as well as new generation members, with the mission of carrying out water management in the community in accordance with the development plan and community water management criteria, such as check dam construction projects and mountain waterworks systems, acquiring the funds from different agencies and organizing events to increase awareness about water and natural resource preservation. 2. Expanding the use of water from check dams. As seen below, each location

has a unique usage pattern of water from check dams.

Models for expandingthe use of water from check dams	Outstanding features	Benefits	Examples of areas with this pattern of water use
Mountain Water Supply	Using the gravity principle that water flows from high to low, PVC pipes (in the past, bamboo) are installed as a gutter running down from the check dam to the community's clarifier. It is practical to distribute water to the community via the check dam.	 It is intended for household consumption and usage. It is a source of water for agriculture. It saves labor and time for water supply. During the dry season, water may be saved for use in a clarifier. 	Ko Kha District, Lampang Province Chiang Saen District, Chiang Rai Province Chiang Khong District, Chiang Rai Province Nakhon Thai District, Phitsanulok Province, etc.
Retarding basin (Monkey cheek)	Water storage sites at different spots across the community to function as reservoirs.	 It serves as a reservoir for the water flowing down from the check dam. It is intended for household consumption and usage. It is a water supply for agriculture. Reduce flooding problems 	Nakhon Thai District, Phitsanulok Province, etc.
Check dam mining system (It is a common traditional irrigation method in the upper northern area or Lanna ethnic group.)	A waterway is built to sustain the water supply from the check dam at the top, which will be excavated at close distances to accept and pass water on a regular basis (by stabbing wood as a main line and weaving them over the whole river).	 It helps distribute water to agricultural areas thoroughly. It reduces the tide's strength. 	Mae Ai District, Chiang Mai Province, etc.

3. Community Forest

Check dam water delivers humidity across a vast area, assisting in the nourishing of the forest and enhancing biodiversity. When the forest is abundant, a natural equilibrium occurs, resulting in a food supply, a source of herbs, a tourist attraction, and a source of natural learning known as "Community Forest".

Community forests are transition mechanisms that enable communities living near forest areas to shift from invading and damaging the forest to participating in its restoration and maintenance. If the people coexist with the forest and jointly manage the forest area, the forest will belong to everyone in the community. Residents will be able to utilize and gather forest resources in a sustainable manner. The community forest functions as a "village supermarket" for a source of food and water. The residents can get wild mushrooms, bamboo shoots, and herbs, fish and frogs for household. Furthermore, it may be expanded by using those resources to create a community enterprise that sells and generates incomes for



the community in another manner. However, it must abide by the laws and norms established by the community. It may also be developed as a tourism destination, an eco-learning facility for interested persons, revenue distribution and a circular economy within the community. As a result, the community forest may help save expense, earn income, establish a profession, and support residents and their family. As a consequence, the community is strong and harmonious, allowing people to live peacefully, with a feeling of love and preserving their homeland, avoiding the need to immigrate, as well as providing stability in life within their community. Mr. Anusak Thammathiwat, Assistant Village Headman of Tham Phrik Village, Nakhon Thai District, Phitsanulok Province, said, "This year, the residents will definitely survive the drought." I noticed the residents of Tham Phrik Village, Nakhon Thai District working and earning income from the community forests. They have vegetable gardens, pineapple farms, and also raise animals on their own. Finally, the residents would become more self-sufficient and happiness to their families and community."



Check dam's success

Check dam "Principles" under the "People... Saving Water, Saving Land" Project must be stable, strong, attractive, and functional". Furthermore, the project's execution in many upstream areas has revealed that the check dam's success is in line with the "Principles."

We will present the "Factors" of success in check dam construction in this section, explaining why "People... Saving Water, Saving Land" check dams are stable, strong, attractive, and functional according to the principles of "Downstreamers" intended to offer them to "Upstreamers" through the perspectives, concepts, and experiences of check dam teachers, community leaders, residents, volunteers, working groups, and alliances.



• The first part of the contents to be presented derives from the first meeting between the PAT and local residents. The PAT's team must communicate decisively and clearly by expressing firm vision and determination, as well as willing to listen and offer honest opinions, including what to give to the residents, residents' requirements, terms of agreement, budget disbursement, follow-up process, evaluation, and others, to create understanding for community leaders in using the information to hold a community meeting.

• The second half of the content derives from a team of community leaders or local residents who attend the meeting must understand their intentions, be committed, and ready to collaborate with the PAT as well because these groups must convey information to hold a community meeting with the residents and be the leaders of the check dam construction in the area. Furthermore, these people should be knowledgeable with natural systems, water systems, check dam systems, social geography, terrain, and community areas, among other things, to allow for greater flexibility in project coordination.

Check dam's success is caused by... half and half. (Lieutenant Boonsom Janped: Check dam teacher) Chiang Saen Commercial Port Personnel, representatives of local government agencies (such as Chiang Saen District Chief, Sub-district Headman, Village Headmen, and Forest Department Officials), as well as local residents were three major synergies driving the development of check dams in Chiang Saen District.

The PAT supported the budget, the government agencies in the area supported the smooth operation and the residents help with their physical and mental efforts. Every day, 60-80 people assembled and walked for several kilometers into the forest to construct the check dams on the mountain for many days, since "water" is the residents' hope and expectation.

Check dam's success is caused by... three coordinates. (Mr. Nattapol Ratchatasilapin: Manager of Chiang Saen Commercial Port)



• Despite the steep mountain terrain, the leaders and local residents of Kew Karn and Kew Doi Luang villages continued to travel into the forest with bags of cement, stones, sand, and bamboo cut from their houses. They cleared the grass with a machete while traveling to the check dam building site at a height of more than 800 meters above sea level. Although the trip was tough, with the collaboration of the leaders and participants, the check dams were completed on time, and the water spilled on both dams, **benefiting more than 300 households**.



Check dam's success is caused by... **the strong leader and the united residents.** (Pol. Lt. Col. Kittikhun Changkian: Director of Chiang Rai-Payao Vocational Border Patrol Police School)

• Since we believe there is no set formula for constructing check dams, we must change based on the unique elements and restrictions of each location. As a result, before constructing a new check dam, a community meeting was held with community leaders, residents, and people involved in the area to discuss and express opinions using lessons from both success and failure as a standpoint and allowing the residents to jointly think, design, make a decision together by learning from the original check dams and improving it to achieve the kind of check dams that the local residents desire the most, since the check dams belong to everyone.

Check dam's success is caused by...**mistaken lessons.** (Mr. Damneon Chiangpan: a Member of Uttaradit Provincial Agriculture Council) • One thing clearly visible is that the check dam building activity fosters public awareness that prioritizes the people's interests more than their own for the PAT employees. Every year, a large number of the PAT volunteers look forward to the trip of check dam construction. Everyone is determined and sincere, despite the fact that the task is exhausting, hot, demands a long and tough travel, etc. However, they are willing to do since they know that the check dam would help provide water, life, and a decent environment for the people in the long run. At the same time, an activity of check dam construction has served to imprint the identity of a group of volunteers willing to devote their energy, passion, and intellect to the area's residents. It is a fine role model for residents to follow in terms of developing and providing advantages for their communities and society in the future.

Check dam's success is caused by...**dedications.** (Mr. Kittipong Sornsa-ad: the project's working group)

• Thailand's most significant social unit was represented by houses, temples, and schools. "BorWorRor" is more than simply a geographical name; it refers to a community that supports one another. As a result, every activity that takes place in Na-In Sub-district, whether it is religious ceremonies, organizing social events, or building check dams, etc., must always go through a meeting, suggestion, and cooperation from residents, monks, and students because everyone in Na-In Sub-district **seems very stable and has great faith in "BorWorRor"**. We believe that if these three institutions are robust, the community and society will grow in a productive way, resulting in a peaceful and harmonious community and society.

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Check dam's success is caused by...**strong BorWorRor.** (Mr. Muang Sodnamon: Check Dam Construction Coordinator of NaIn Sub-district)

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• SC Group has collaborated with the Port Authority of Thailand as an alliance from the project's inception in the first year. We have observed the PAT's strongly intention and devotion throughout the years, where the Executives of the organization not only support the budget but also take the time to actually take the staff to accomplish the job. The local residents have been waiting for the check dam, which they still lack. Actually, **they do not need cakes** or other items, **but rather water**. When the PAT creates water for them, it is deemed that the water assists complete life, happiness, and well-being of the villages as precisely as possible.

Check dam's success is caused by... **giving what is required.** (Ms. Bongkoch Roongkornpaisan: SC Group Alliance)

• The PAT team took the alliances to the area where the check dam was successfully erected last year one day before the check dam construction date. We witnessed images of overflowing check dams in the lush and damp forests, as well as the residents' paddy fields. At the same time, the following day was check dam construction day, when the PAT staff, alliances, and local residents came together to help build check dams in the hot and dry stream with the hope that one day this place would be fertile again.

We saw entirely distinct before and after photographs on both days that we participated in activities with the PAT. There was a firm determination to really take responsibility for the upstreamers. **This was referred to as concrete and felt social responsibility**.

Check dam's success is caused by...

commitment to Corporate Social Responsibility

(Ms. Hassawara Saengruji: Krung Thai Asset Management Co., Ltd. Alliance)

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• In view of the project coordinator, the first accomplishment is the result of the team's efforts. Everyone on the team must be focused on the same objective, and the solution is the Port Authority of Thailand, as the Downstreamers who utilize the river for a long time, we are constructing a check dam to collect water in exchange for the Upstreamers.

As a result, **the team must trust in good** that we will accomplish for the communities. At the same time, respect, confidence, and trust must be given to the persons on the building site, namely the "check dam teacher team," since these people are like the PAT's officials who must sacrifice both physical and mental efforts. As a result, the team must listen, put the check dam teachers at ease, and be willing to really assist them in solving issues.

Check dam's success is caused by... Have faith in yourself - believe in others. (Mrs. Ajaneeya Tananont: Project Coordinator)



• The success of a check dam construction project in every area depends on a variety of factors, but the most important is **the systematic and efficient management** of the working group, beginning with site surveys, getting to know community leaders and residents, cooperating in the check dam construction, and continuous performance monitoring.

> Check dam's success is caused by... Management System (Lt. Gen.Taweesak Winitsorn: Army Special Expert)

• "Volunteering Spirit" comes from the "heart", not from "caps or scarves". From my perspective of participating in the "People... Saving Water, Saving Land" Project, it is an excellent effort that demonstrates the strength of togetherness and volunteering. The PAT focuses on raising awareness of local residents to love and preserve the check dam, allowing everyone from all sectors to participate in the sacrifice both physically and mentally as well as causing the PAT's check dam construction a success and truly benefit the area as the saying that "Building check dams is more benefit than water".

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Check dam's success is caused by... Volunteer spirit. (Mr. Rattikan Petngam: PAT's Volunteer Spirit 904)



• The PAT and alliances have pledged to continue on His Majesty King Rama IX's ambitions of conserving upstream areas for Thai people to have a better life in terms of use, consumption, and agriculture. Since 2016, the PAT has begun to construct check dams in **several regions, obviously assisting in the restoration of life to the communities**. We, as Downstreamers, are still resolved to construct check dams in accordance with the King's Philosophy in order to conserve water and provide a good living for Upstreamers in perpetuity.

Check dam's success is caused by... Following in the King's footsteps.

(Mr. Apiset Pongsuwan: PAT's Executives)

• It is commonly understood that the majority of check dams must be constructed in the upstream forest region for maximum efficacy in storing and slowing down water. However, in certain location, legal problems relating to forestry pose barriers and limits in the building of check dams, as a result, people in the area face the problem of water shortage. However, as the Head of the Forest Protection Unit, I always adhere to His Majesty King Rama IX's directions on **the behavior and fulfillment of responsibilities in the public benefits**, as well as the National Reserved Forest Act, B.E. 2507, Section 19 as a guideline for carrying out responsibilities. "Forest Department authorities may ask for authorization to operate in reserved forest areas for the purpose of regulating, preserving, or maintaining national forest reserves." I've been permitted to run forestry from Section 19 multiple times in the past.

Check dam's success is caused by... Integrity (Mr. Ngiam Pama: Former Uttaradit Forest Protection Unit Chief)







TRULY HAPPY... UPSTREAMERS

PEOPLE... SAVING WATER, SAVING LAND



Truly happy...Upstreamers

His Majesty King Bhumibol Adulyadej the Great emphasized the necessity of developing water sources and irrigation systems to address the issue and relieve the suffering of those who lack water for use, consumption and agriculture, as His Royal word.

"Most of the significant duties are irrigation works. Since the country would be parched without irrigation. It is impossible to cultivate arid land. There is no agricultural labor when there is no cultivation, since agricultural work is directly useful to the people."

This is an example of "Upstreamers," who formerly lacked water for use, consumption and agriculture owing to the degradation of upstream watersheds and a lack of understanding about water retention. However, thanks to the assistance and support of the "People... Saving Water, Saving





Land" Project, a group of "Downstreamers" who set a determination to preserve upstream areas in order to return water to the land following the footsteps of His Majesty King Bhumibol Adulyadej the Great, these "Upstreamers" have revitalized their lives once again. What will Upstreamers' new lives look like today? The author collated the interview responses. "Agriculturist... the important people of the King", in transmitting messages on this issue, the author didn't create any terms in the interview because the author wanted to authentically express the emotions and sentiments of the local residents via their own languages.



• The farmers here can only cultivate in-season rice once a year and must wait for the rainy season to do so. They can't cultivate off-season rice since there isn't enough water. Other than cassava production, we are unable to engage in any other sort of agriculture. However, after the PAT built 6 check dams, the residents were able to cultivate off-season rice and sell it all year, while houses locating in the check dams surroundings could grow vegetables, raise ducks, chickens, and buffaloes. In addition, the check dam areas began to have lush forests, and **the residents return smiling, vivacious and self-sufficient happiness, according to King Rama IX's precepts**. We, the residents of Na-In Sub-district, would like to express our sincere gratitude to the PAT.



Teacher Kamrai Kornkaew Na-In wittayakom School Na-In, Pichai, Uttaradit Province

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FRULY HAPPY...UPSTREAMERS

Prior to the construction of a check dam, 88 households of our community had just 100 cubic meters of water storage, and the people were still in difficulty due to a lack of water to meet their needs. However, when the PAT came to construct the first check dam, our water reservoir grew 100 times, ensuring that the residents of Nakhon Thai survive the drought this year. Furthermore, "Water from check dams" assistresidents in creating employment and a profession by growing Batavia pineapples and improving processed pineapple goods with a standardized pineapple processing facility that can be marketed as OTOP products of Ban ThamPhrik Village, Ban Yaeng Sub-district in TP Fresh Brand, including pineapple juice, pineapple cheese pie, chewy pineapple, etc. Thanks to the PAT's check dams, our aspirations have come true. At the moment, agricultural group members, including residents, have higher earnings, are self-sufficient, and have reduced immigration into the city. I would like to thank the "People... Saving Water, Saving Land" Project on behalf of the villages. Thank you to the executives, Teacher Pued's team, and Check dam teacher's team for providing us with information and teaching us the check dams construction methods.



Mr. Anusak Thammathiwat

Assistant Village Headman of Thamprik Village, Ban Yaeng Sub-district, Nakhon Thai District, Phitsanulok Province





Mr. Samad Bootboon Former SAO member of Na In Sub-district, Pichai District, Uttaradit Province • Although there was once a Cham Nak Reservoir that provided water to all 2,000 Na In households, when the dry season arrived, this large raw water source, Cham Nak Reservoir, nearly completed dried up, (Almost every year, Na In is announced a drought disaster area.) causing both residents and pets to suffer greatly. Until the dry season in 2019, since the PAT built a check dam in Na-In Sub-district, the local residents were not as distressed as previously, the residents had sufficient water for cultivating and growing vegetables. The official of the Sub-district Administrative Organization (SAO) recently came to assess the water level and decided that the water in the check dam can sufficiently maintain all 7 villages throughout this year's dry season. This is the finest present we've ever received.



TRULY HAPPY...UPSTREAMERS

...On May 23, 2006, two landslides happened between 8:00 p.m. and 2:00 a.m. Mae Phun was the hardest hit. Nearly a hundred residents were killed. More than 200,000 rai of agricultural land was devastated, ready-to-sell durian, longkong, and langsat production failed, and everything collapsed. It took me about a month to evaluate the damage in my own areas because I had to wait for troops to bring heavy equipment to open the area since soil, sand, giant trees, volcanic rocks, and other debris had been blown up to cover an area higher than 3 meters. In terms of the residents' life at the time, they had to wait for food and drinking water donations. Every time I had to carry a container to stand in front of my home to accept a water donation, it frustrated me because I always believed the Mae Phun Sub-district was a source of water, with waterfalls, big woods, and streams, but there was no drinking water. We had to stand up and beg for it from other people.

Until 2016, when the PAT arrived to create a check dam at Laplae District, such nightmares would never happen again because when disaster occurs, the leader would be the first to know and will instantly notify residents over the Public Address System. During the critical time, the check dam will assist slow down the flood water and extend the time for residents to prepare themselves, pack their belongings, and instantly move up to a safe spot, resulting in less damage than in the past. The PAT's check dam ,therefore, represents hope, pleasure, and new life for the Laplae people.

Mr. Banjong Khumsuwan

Village Farmer Volunteers Mae Phun Sub-district, Laplae District, Uttaradit Province







Mr. Pratuan Plongyoo Pa Tueng Village Headman Ban Saeo Sub-district, Chiang SaenDistrict, Chiang Rai Province



 Yes! Every day, we drink and bathe in water from the Ab stream, but we have to share it with "pigs. In terms of living circumstances on the mountain, the people mostly earn their living by farming pigs. When they bathe the pigs or the pigs excrete, the dirt pours down the river. Inevitably, my village is located underneath that river, so the residents have had to eat and drink water together with pigs for many years. Until Chief Natthaphon (Mr. NatthaphonRatchatasilp), Chiang Saen Commercial Port's employee under the Port Authority of Thailand, known about the residents' terrible life. He then proposed the matter to the PAT executives until the project was approved. I would like to thank the PAT executives, working group, and staff of the Chiang Saen Commercial Port for listening and being nice to the residents, as well as the check dam teachers for instructing and assisting in the construction of the check dam for Ban Saeo Sub-district today. I and the rest of the locals are overjoyed and have a big smile since we no longer have to eat and drink together with pigs.

TRULY HAPPY...UPSTREAMERS



Mr. Kampan Kammaboot Pu Dai BeachResidents Na Saeng Sub-district, Ko Kha District, Lampang Province

 My 18 cows are now developing quickly and maturely because I take them out for a stroll in the morning to eat grass and drink water, which makes the cows happy all day.In the past, they were skinny and easily ill earlier since they had to walk for a long distance to drink water and eat food at Wang River, which they reached at approximately midday, and they had to go back and forth for 4 hours a day, both humans and cows were exhausted. In addition, I had an issue with the people on the route since the road will pass through the village and cow excrement will fall all the way. I used to fix the issue by not bringing cows to walk through that way and pumping water from the river to release in the field, but I can't afford to pay the electrical bill. Today I am completely satisfied. There is enough water to drink for both humans and cows. When they leave the fields, they may drink the water in the check dam. When the cows returned to the home, there was a plumbing line conveying water from the dam to the cement tank. Pets can eat all day and night. I'm very happy.



Mr. PlianYaemyindee A villager of Mae Phun Sub-district, Laplae District, Uttaradit Province • For a long period, the Mae Phun Sub-district lacks natural water sources. Only stones and dirt clods remained in the dry brook. There isn't enough water to nourish durian trees and fruiting crops. So my daily routine is to buy gallons of water loaded on a sidecar to water the plants on Laplae mountain, consisting of durian, longkong, langsat and mangosteen, with total approximately area of 40 rai. I had to drive a sidecar up and down on a 30-centimeter cement road 5 round trips a day. It costs between 800 and 1,000 baht per day, including fresh water and gasoline and others. Finally, I had to take a loan to purchase water for watering the trees. Other farmer friends struggled as well; some refused to approach the planting area because they couldn't bear the sight of their own durian plants withering from the high heat and dryness.


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life," and we have a joyful life back home with our family. The people love and unite more, and if they hear that additional check dams will be built, they will support each other since everyone understands the advantages of the check dam's water.



The outcome validates the Upstreamers' level of satisfaction.

The PAT has constructedcheck dams for Mae Phun Sub-district since 2016, then Laplae District's natural resources have been improved. It has brought happiness and peace to the community, because check dams have helped create humidity both on the ground and underground in all directions for more than 5-6 years, resulting in a reduction in the number of forest fires, an increase



in the amount of water that can be stored, as well as the production of economic crops and

an increase in people's income, as shown in the table indicating the amount of water.

Year	Water Volume (CBM)	Damage from forest fires		Durian	Long Kong
		Forest Fire Volume (%)	Damaged Area (Rai)	Production (Ton)	Production (Ton)
2017	983	10	2,000	10,700	19,000
2018	1,163	7	1,000	11,000	19,500
2019	1,358	3	200	15,000	20,000
2020	1,570	-	-	15,500	24,000
2021	1,938	-	-	28,000	25,000

Source: Uttaradit Provincial Agriculture Council Office - December 2021

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FROM THE HEART... TRUTHFUL PEOPLE



From the heart... truthful people

Eighty check dams in nine provinces, and twenty districts

are not enough to declare the project success, but it confirms that we are on the right way, and we intend to continue retaining water for the land,

as shown in the table indicating the top 10 provinces that have accumulated water from which we, the Upstreamers and Downstreamers,

have helped "retain" from 2016 to the present.



No.	Province	District	Sub-district	Water Volume/CBM
1	Uttaradit	Mueang Uttaradit	Wang Din	101,400
2	Phitsanulok	Wang Thong	Nok Aen	68,400
3	Lampang	Ko Kha	Na Saeng	63,230
4	Uttaradit	Phichai	Na In	49,612
5	Uttaradit	Laplae	Mae Phlu	22,160
6	Chiang Rai	Chiang Saen	Ban Saeo	15,000
7	Phichit	ThapKhlo	Thai Thung	11,500
8	Chiang Mai	Mae Ai	Ban Luang	10,464
9	Phitsanulok	Nakhon Thai	Ban Yaeng	7,400
10	Phrae	Rong Kwang	Nam Lao	3,600

Source: Engineering Department, Port Authority of Thailand – December 2021



Conclusion...Building check dams is more benefit than water

While reading this page,

the readers will understand well and may assist to further communicate that building check damsis more beneficial than water is practical and effective. From an abstract message, it has become evident that in certain regions, there are some little streams, some large, and some different, resulting in a disparity in the quantity of water gathered. However, the size of the area is not as important as further development and treatment to ensure that the water remains in the community in perpetuity. Finally, keeping the phrase "...More than water" to be precious, valuable, and powerful depends on determination, patience, kindness and unity of the people in the community.







Shared Happiness and Prosperity

Upstream Community : be self-reliant Downstream Community : be country's economic driving force

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