

COMMUNITY WATER RESOURCES MANAGEMENT IN THAILAND

Chataramongkol Singhawiboon¹, Wongsathit Boonthunyakorn², and Jumpol Nimpanich³

ABSTRACT

Water is one of the most important natural resources for human being and wildlife all over the world. The physical planet has changed and we have recently seen a number of unwanted developments: global warming, climate change, greenhouse effect, el nino event, la nina event, drought and others, these changes have made the available volume of water unstable. Furthermore, the increase of the world population will increase from 7.2 to 9.2 billion people in the next 31 years that can have impacts on water and food security. So the important world and Thai organizations are concerned on how to manage water resources. The hypothesis of this research was that the communities could manage the water resources by themselves. And the objectives of this research were 1) To study and value the community in water resources management, 2) To study the roles and responsibilities of community in water resources management and 3) To find "Community Water Resources Management ways" in order to develop the community best practices.

This research design was a qualitative study, the following research tools were based on Walter Wallace Wheel's Diagram, documentary research and in-depth interview from the Key-informants divided into three groups. The first group was the twenty-five farmers who were continuously engaged in water resources, the second group was two members of private sector organization involved in commercial water resources management and the last group was fourteen government officials with expertise in water resources management.

The four research areas were used as follows. The first area was Loa CheeKui village located in the North of Thailand. The second was Don Rug village located in the South of Thailand. The third was Huy Ta Klae village located in the Central of Thailand. And the last was KraSeaw Dam located in the Central of Thailand.

The research has shown that civil society, the private sector and the public sector needed to work together to find solutions to water resources and food security. And the communities themselves should hold the core of water resources management and food security to avoid the water crisis in the near future.

Keywords: Community, Water Resources, Management

1. INTRODUCTION

Water is one of the most important natural resources for human being and wildlife all over the world. The physical planet has changed and we have recently seen a number of unwanted developments: global warming, climate change, greenhouse effect, el nino event, la nina event, drought and others, these changes have made the volume of water unstable. Furthermore, the increase of the world population will increase from 7.2 to 9.2 billion people in the next 31 years) United Nations,

¹ Ph.D. of Public Administration and Irrigation Engineer of Royal Irrigation Department of Thailand. Email: chatara039@gmail.com

² Ph.D. Candidate of Public Administration of Rangsit University and Irrigation Engineer of Royal Irrigation Department of Thailand.

³ Associate Professor Doctor of Rangsit University.

Department of Economic and Social Affairs Population Division, 2014(that can have impacts on water and food security. So the important world and Thai organizations need to manage water resources for efficient water management and learning about the overall characteristic of water resources as shown in the figure below.



Figure 1. Water Resources Characteristic and Management Diagram
Source: Singulation, C.(2018)

The amount of water on the earth’s surface depends on many environmental conditions such as forest, sunshine, atmosphere etc. The utilization of forest, fuel and fossil cause impact on the atmosphere resulting in climate change and global warming. Water resources can be divided into 4 categories: freshwater, saltwater, brackish water and hard water by the different characteristics, and water resources management needs to be considered in 5 ways as follows:1) Water benefit management2) Water damage management3) Ecological and environmental management4) Responsibilities of each sector and 5) Water vision; however, the researchers focus only on benefit of water resources management.

World watch institute evaluated the use of water at a global level of 70 percent for agriculture, 19 percent for industrial use, and 11 percent of the consumption for domestic use(<https://www.voathai.com/a/water-scarcity-tk/1636732.html>). International Water Management Institute; IWMI has defined the meaning of water scarcity as the relationship between water demand and water quality. The United Nations is aware of the importance and has declared the 22nd March every year as "World Water Day" since 1993. World Water Council, The World Bank and International Financial Institutions also focus on large water resources development projects to overcome water crisis which affects the environment, forest, wildlife, ecosystem, and human beings. So a solution is required to take into account all these dimensions. In addition to supply a new water resources, it is also required to consider water efficiency, promote the spread of water to the farmland where water is scarce significantly..

2. BACKGROUND AND THE IMPORTANCE OF THE PROBLEMS

Thailand is located in Southeast Asia and is composed of 77 provinces. The total of population is about 68 million people.

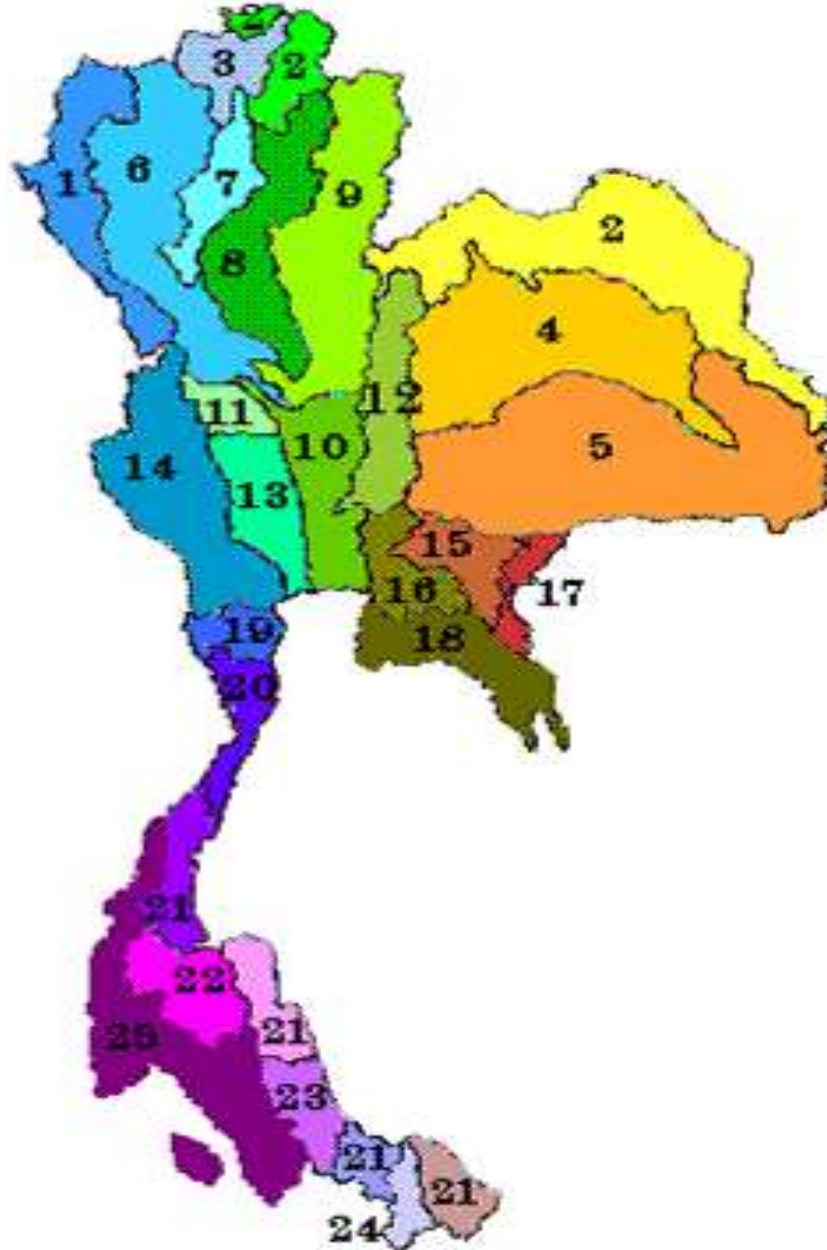


Figure 2. The 25 basins of Thailand

Source: <http://irre.ku.ac.th/v5/index.php/irr-data-menu/25-basins-menu>

Thailand has 25 basins namely, Sarawinbasin, Mekong basin, Kok basin, Chi basin, Mon basin, Ping basin, Wang basin, Yom basin, Nan basin, Chao Phraya basin, Sakakrang basin, Pasak basin, Thacheen basin, Maeklong basin, Prachinburi basin, Bangprakong basin, Tonlasab, Eastern Seaboard, Phetchaburi basin, PrachuapKhiri Khan Sea coast, South East Coast, Tapee basin, Songkhla Lakebasin, Pattanee basin and Southern West.

Thailand is an agricultural country for centuries. The lifestyle of Thai people is simple; however, the current global warming has impacted on water and food security in Thailand like the other countries.

Since 1987 until now, Thailand has total of 12 economic and social development plans, the national Economic and Social Development Plan No. 12 (2017-2021), the current version has been established in the period where the world has changed rapidly and is linked together. Thus the national Economic and Social Development Board of Thailand has developed a 20-year national strategy (2017-2037) as a master plan with sustainable country development goals. Restructuring Thailand to Thailand 4.0. During this period of time, the development must focus on spatial development to spread out as the whole new economic area in and along the border to ensure the security of water resources from all sectors (Prime Minister's Office, National Economic and Social Development Board, 2016).

From the water resource usage statistics in 2019. Out of a total of 151,750 cubic meters access to water resources is only 102,140 cubic meters. The demand for water resources varies according to the nature of land use as follows:

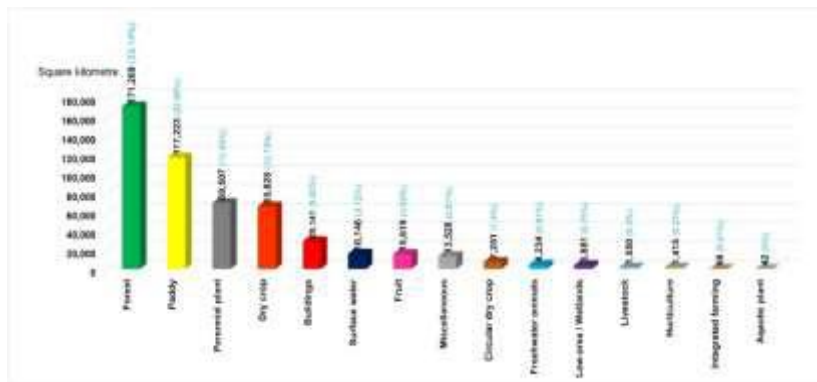


Figure 3. Summary of land use in Thailand (2019), total area 516,822.63square kilometre (Source: [http //agri-map-online. moac.go.th/](http://agri-map-online.moac.go.th/))

The above diagram showed the land use in Thailand (2019) in percentage. The area of 323,014,142 Rai has the forest 33.14, paddy 22.68, perennial plant 13.45, dry crop 12.73, buildings 5.63, surface water 3.12, fruit 3.02, miscellaneous 2.61, circular dry crop 1.40, freshwater animals 0.81, low-area/wetlands 0.75, livestock 0.30, horticulture 0.27, integrated farming 0.01 and aquatic plant 0.00 percent. All land use must rely on water resources from 25 basins across the country.

The land use and 25 basins are linked in various dimensions such as economic, social, political, cultural, and borders. The developing communities to learn to find problems and finding solutions to problems is what governments need to coordinate knowledge from inside and outside the community. The researchers considered that it was required to conduct a sustainable community water resources management in the designated area in this time.

3. OBJECTIVES

The objectives of the community in water resources management are 1) To study and value the community 2) To study the roles and responsibilities of community and 3) To find “Community Water Resources Management Ways” to be community best practice.

4. HYPOTHESIS

The hypothesis of this research was “The communities could manage their water resources by themselves”.

5. RESEARCH AREAS

The four outstanding and particular research areas were Loa CheeKui village, Don Rug village, Huy Ta Klæe village and KraSeaw Dam area.

6. CONCEPTS, THEORIES AND REVIEWED LITERATURES

By reviewing the literatures, the researchers introduced theories and concepts into research approaches as follows:

1. The concept of development for the self-reliance of farmers due to the King Rama IX
2. Civil Public Administration (Laothamatas, A.&Rattanaset, W.,2014)
3. New Public Service)Denhardt, J. V. &Denhardt, R.B., 2007)
4. Self-Reliance Principle(<https://sites.google.com/site/malaneemay/neuxha-bth-reiyn/prathesthiy-kab-sersthkic-phx-pheiyng>)
5. Participatory theory)<http://dspace.spu.ac.th/bitstream/123456789/4541/6/บทที่%20%20สิ่งนี้%20น่าสนใจ%20PHD-2555.pdf>)

7. METHODS

This research design was a qualitative study, the following research tools were based on Walter Wallace Wheel’s Diagram, documentary research and indepth interview from the Key-informants being divided into three groups. The first group was the twenty-five farmers who were continuously engaged in water resources, the second group was two members of private sector organization involved in commercial water resources and the last group was fourteen officers of Royal Irrigation Department (RID) with expertise in water resources management.

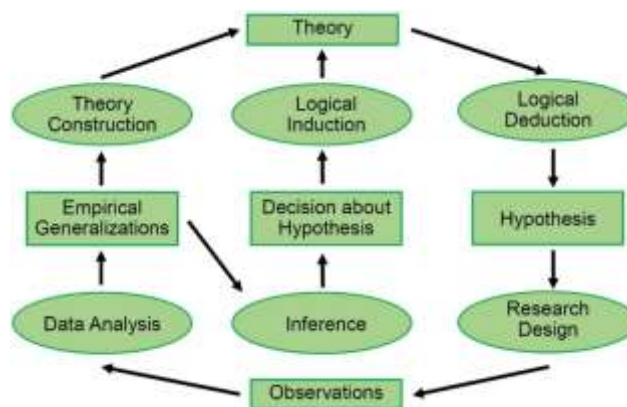


Figure 4. Walter Wallace Wheel (Aldine,1971)

Source:

[https://www.google.co.th/search?q=Aldine.++\(1971\).+Walter+Wallace+Wheel.&tbm=isch&source=hp&hl=th&sa=X&ved=2a](https://www.google.co.th/search?q=Aldine.++(1971).+Walter+Wallace+Wheel.&tbm=isch&source=hp&hl=th&sa=X&ved=2a)

hUKEwiskISti4biAhXGLI8KHYg-A38QsAR6BAgJEAE&biw=1129&bih=532

Qualitative research is the finding of truth from situations, environments in order to understand the insight of holistic unit of analysis context. Some researchers call this way is naturalistic research which let it be. Not manipulate anything.

Walter Wallace's Wheel is one of research types and composed of 8 or 10 steps. Firstly, the researcher has to assume hypothesis statements from documentary research or research problems, hence we often refer to these variables: measures, operational definitions, manifest variables, etc. A hypothesis is a prediction that a particular relation will be found. Secondly, the research design is carefully set by the imagination which are the decisions about the cases studies, areas, focus groups, the method of data collections, the method of measurements, and procedures. The findings should support our hypothesis. And third, observations are the data which impact on our senses and use for our findings. Fourth, data analysis is used for breaking into small pieces and being classified. Fifth, Empirical Generalizations are the groups of data which grouping already. Next, the sixth step, Theory Construction is the step of building the focus each group. Then it becomes theory as the seventh step for using. Finally, Logical Deduction is shown and the researcher of new generation may abolish this theory because it is out of date.

For the other way after the fifth step, Inference is the evaluation of the empirical generalizations to be decision about hypothesis for the logical induction. After that it becomes theory alike. As the diagram following.

How do the qualitative research benefits concern about the irrigation? It may help us find the social research by carefully observation or exploration from body language, words, eyes contact etc. of in-depth interview because the interviewees want to tell something to the interviewer but he can't. So that the qualitative research is an important tool of all researchers ought to use carefully. The translation to our conclusions will be right.

8. RESULTS

From the assumption that "the communities could manage the water resources by themselves". The community must have a concept based on their own self-reliance theory to receive assistance from the public or private sector. And it is consistent with the development concept of the farmers due to the King Rama IX, who said, "The mind is the opinion that it is not a statement, but it is a theory of opinions about what to say. Who doesn't like it? ". So the participation of the people is the key point of development.

The first research area of interest is Loa CheeKui village, Yoa Thai Mountain community, whose a long-lasting self-reliance is still there. It is located in Maejun district in Chiangrai, in the North of Thailand. There are total population of about 150 people. The management of this community in the early stages did not have a village water source. Their lives were tough. To improve their quality of life, HRH Princess Sirindhorn initiated a development project that created a reservoir for water conservation for them.

The water resources problems at the village found that water resources management requires careful thinking of conflict because there is small amount of water. The village committee was established to participate in water resources management. The water user group causes exchange of ideas, working, responsibility and benefit sharing. The officers of RID has continually provided knowledge of water resources to them. It makes the cooperation between community and the officer to be better. The villagers

have the foundation for love to live together according to ethnography as a large family.

The second area, Don Rug village located in Pattani, in the South of Thailand, is a multicultural area between Muslim and Thai. There are consisting of 1,200 households, the area is about 1,000 rai and relying on water from Pattani Dam. What are the factors that make this community successful in the midst of different cultures? The researchers found many factors such as 1) relationship between people although different religion 2)

The RID officers act as a facilitator in the process of inviting farmers to participate in various ways of thinking to share the water that has been optimized thoroughly and fairly. The farmers are mostly interested in related field trips in order to apply for their agriculture. 3)

This community received rice seed support from the National Science and Technology Development Agency such as HomCholasit Rice.4)

When there is excess water, villagers will use many methods of digging ponds and keeping water for use when water is scarce. There is a pipe linking together and a water diversion to help the reservoir where the water is depleted, called "Sa Phuang". It makes water all the time. This activity reflects the sharing that maintains commitment and good relation. 5)

The effective communication between officers and farmers, farmers and farmers make it complete. 6)

Water user groups have been established from the advice of the RID officers. 7)

This community was honored as an agricultural learning center in 2016. 8)

Inspiration that this community has confidence in their thoughts or actions that can happen in concrete ways.

The third area, Huy Ta Klæe village located in Phetchaburi in the Central of Thailand, is an area that has failed to manage water resources. Since the use of water resources from water sources is free, there is no limit. It is not cause proper performance. When the water shortage occurred, there was a conflict between the farmers and the water users. Disputes and subsequent divisions appeared between the people as Edward Lawrence said in a Chaos theory.

The last area, located in KraSeaw reservoir Danchang district Suphunburi in the Central of Thailand, is a highly successful area until being awarded the Public Service Quality Award in 2010 and the United Nations Public Service Awards 2011. It is appropriate to be water resources management model by participation principles. Establishment of irrigation management committee which consists of representatives from 4 parts: farmers, water use groups, RID officers and private sector organizations. The total service recipients of approximately is about 7,000 people. It can cultivate more than 1 time per year, farmers have more income and reduce conflicts in the community. Problems and obstacles during the first phase of operations were the unacceptable attitude of RID officers in irrigation management methods, lack of integration skills in large irrigation area and the large number of water users. It can be seen that the factors that make the water resources management of the KraSeaw reservoir successful until receiving important awards include participation

systematic coordination, having the farmers volunteers, getting support from the private sector and every sector sees the future together.

9. DISCUSSIONS

Based on document research, the researchers found 7 concepts and theories as follows: 1) Social learning 2) Integration of government 3) Community network 4) Good governance principles 5) Public participation 6) Local wisdom and 7) Knowledge transfer. And there are 11 items in the field, as follows: 1) Civic Public Administration and New Public Services 2) Participation of all sectors 3) Learning culture of local communities 4) Theory of accustomed 5) Self-esteem 6) Inspiration 7) Integration 8) Communities and networks 9) Chaos theory 10) Local democratic community self-reliance and 11) Leadership of community leaders and entrepreneurs associations.

From the above, **18 findings**, they are consistent with the concept of Civic Public Administration (CPA), New Public Management (NPM), New public services (NPS) which can be used to manage community water resources sustainably. By synthesizing the findings together with the concept of Public Administration (PA) as follows.

CPA means government administration focused on creating citizens changing the poor or the lower class to be strong know their roles and duties under the law traditions and traditions can be self-reliant ready to cooperate with the government sector to create prosperity for the nation strengthen civil society with sustainability (AnekLaothamatus and WalaipornRattanasad, 2014). The creation of citizenship is evident through the foundation of the administration of three public affairs.

The first time is the time according to the Old Public Administration, which is the ideal bureaucracy of Weber. There are 6 principles: 1) There is a clear administrative boundary. 2) Adhere to the structure and command line 3) Centralize power 4) Adhere to training and expertise to determine the management position. 5) Hiring full-time staff and 6) Administration is in accordance with rules that are not flexible.

From the time of the absolute rule of the civil rights of the people as citizens as the recipient of the order and only follower. The central authority therefore is in the central government, and the participation has not yet appeared. Subsequently, there was a democratic form of government in which the representatives of the people chose the representatives to act on their behalf,

Separation of politics from administration, politicians act as policy makers, government officials act as practitioner. People have a duty to receive benefits and impacts from policies. Participation in various activities is not yet visible.

From the accumulation of various problems in government management economic crisis, technology, new policies including the needs of the people that change according to the world. So the second time was appeared in the name of New Public Management (NPM), reform of the public sector management, that changes the perspective for people to be like customers based on the business sector concept. There is a competition to reduce monopoly, use the marketing mechanism in the preparation of public services. It was an important time for reducing government size and decentralization reduce management according to the command line as a contract management. There is a system for measuring performance, determining the indicators and standards of the work in order to maximize the efficiency of the public sector to be as professional, economical and cost effective. There is a performance evaluation focus on public service is an important mission. That uses civil society participation to find ways to develop communities

The current time is the time of the New Public Service (NPS). It is a concept in the perspective of public administration that searches for real problems from public services that government and civil society should cooperate. There are discussions which are consistent with democratic governance, creating citizens to be citizens and bringing accurate public benefits that meet the objectives of service recipients while limited natural resources, relationship with democratic form of deliberative democracy focus on discussion and explanation and use the principle of participation as an important issue.

The foundation of NPS comes from two concepts are the Old Public Administration and the NPM has been analyzed in three issues: The first issue, the mainstream of public administration, is clearly mentioned in the past by Woodrow Wilson, Frederick Taylor, Luther Gulick and Herbert Simon. Focus on top-down control, and later as a rational choice concept, but not much has been accepted therefore arguing for the second issue of Marshall Dimock, Robert Dahl and Dwight Waldo which focuses on the specific circumstances that are appropriate and necessary which is generally accepted as well. And the last issue, the NPM has appeared in the manner of government options in the form of operations comparable to doing business by focusing on contracting, marketing, in which people can have a service option that suitable called Public choice theory and implementation.

NPS consists of 4 key points: 1) theories of democratic citizenship 2) models of community and civil society 3) organizational humanism and the new public administration, and 4) postmodern public administration. (Janet V. Denhardt & Robert B. Denhardt, 2007)

NPS has a democratic framework, citizenship and services to obtain public benefits is the best choice. CPA, NPS and Participation between civil society, the private sector and the public sector must have a corresponding role and duty. Therefore can be applied to the management of community water resources sustainably.

10. SUGGESTIONS

Community water resources management is a guideline for spatial development. We should find what, where, when, why and how the real problems are occurred, carefully put many ideas into problems solving. There should be a public relations plan, campaigning for stakeholders to recognize the importance of participating in the issue of opinions on problems that arise. The facilitator must be a person who has been trained and has enough skills. Study the form of stakeholder meetings that any form is appropriate. Summary of problems and solutions must be professional have justice. Allocation of water resources to any activity should depend primarily on civil society in the area, not orders from the government or politicians. We should have the establishment of volunteer irrigation groups from people with public minds and should have water storage according to the amount of water usage at an appropriate rate.

The things mentioned above are all factors that contribute to the success of sustainable community water resources management.

11. CONCLUSION

From the study, the researchers found the valuable ideas and theories, roles and responsibilities for community water resources management as 18 findings and created ways called "Community Water Resources Management Ways: CWRM Ways" as follow:

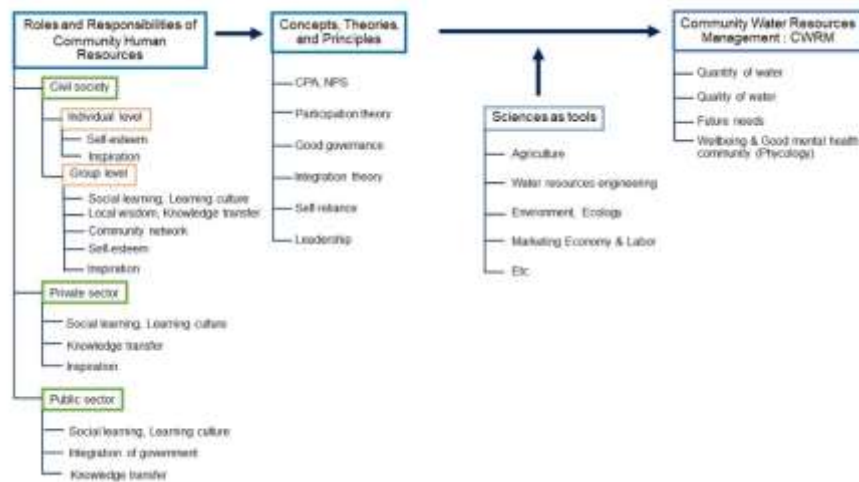


Figure 5. Community Water Resources Management Ways: CWRM Ways

The CWRM Ways above, to demonstrate the importance of the community to have a systematic concept in community water resources management. Therefore, roles and responsibilities of community human resources must be qualified of civil society, private sector and public sector. Concepts, Theories and Principles of management are needed. And the other sciences are as tools to create the most beneficial and sustainable water resources management as best practice.

REFERENCES

- Denhardt, J. V. & Denhardt, R.B. (2007). *The New Public Service: Serving, Not Steering*. New York: M.E. Sharpe, Inc. 27.
- Department of Economic and Social Affairs Population Division, *A Concise Report*, United Nations. 2014.
- The World Population in 2014*. New York: United Nations. 2.
- Laothamatas, A. & Rattanaset, W. 2014. *Civic Public Administration*. Bangkok: Dhurakij Pundit University. 32-34. Thai.
- Office of the National Economic and Social Development Board, The Prime Minister Office. 2016. *The Twelfth National Economic and Social Development Plan 2017-2021*. N.p.: n.p.. 3-4. Thai.
- Aldine. 1971. Walter Wallace Wheel. May 6th, 2019, Retrieved from [https://www.google.co.th/search?q=Aldine.+\(1971\).+Walter+Wallace+Wheel.&tbm=isch&source=hp&hl=th&sa=X&ved=2ahUKEwisklSti4biAhXGLi8KHg-A38QsAR6BAgJEA&biw=1129&bih=532](https://www.google.co.th/search?q=Aldine.+(1971).+Walter+Wallace+Wheel.&tbm=isch&source=hp&hl=th&sa=X&ved=2ahUKEwisklSti4biAhXGLi8KHg-A38QsAR6BAgJEA&biw=1129&bih=532)
- Luakkasem, B. 2019. *Thai Agricultural System under Global Warming*. (n.d.). April 1st, Retrieved from <http://www.measwatch.org/sites/default/files/bookfile/ดร.เบญจวรรณ%20ฤกษ์เกษม.pdf>
- Participatory Theory. April 1st, 2019, Retrieved from <http://dspace.spu.ac.th/bitstream/123456789/4541/6/บทที่%20%20สิ่ง%20ที่%20น่า%20สนใจ%20สำหรับ%20PHD-2555.pdf>
- The Concept of Development for the Self-Reliance of Farmers due to the Royal Majesty in King Rama 9. April 10th, 2019, Retrieved from

http://www.chaipat.or.th/site_content/70-3/283-self-reliance.html

The Ministry of Agriculture and Cooperatives. 2017. May 7th, 2019, Retrieved from
<http://Agri-map-online.moac.go.th>

The 25 basins in Thailand. May10th, 2019, Retrieved from

<http://irre.ku.ac.th/v5/index.php/irr-data-menu/25-basins-menu>

Worldwatch Worries that Water Shortage Problems Around the World are Tougher. April 1st,
2019,

Retrieved from <https://www.voathai.com/a/water-scarcity-tk/1636732.html>