

# Disaster Management that Works: Flood Management Strategy and Implementation in Nakorn Pakkred Municipality

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## Abstract

In November 2011, the flooded area of Northern Bangkok was a sight to behold. Two of Thailand's finest universities—one public and one private—were completely under water. No dry ground could be seen within a 50-kilometer radius. Shopping centers, schools, temples, and private residences were severely affected by what soon came to be named, "The Great Flood of 2011." Earlier, in late October, despite repetitive announcements that everything was under control, the Royal Thai government and the Bangkok Metropolitan Authority (BMA) had finally issued an executive decree ordering all residents in Bangkok's northern boroughs to evacuate their communities. Leaving behind their beloved homes and properties, the Northern *Bangkokians* were housed at government shelters scattered among multiple locations in Thailand's capital and largest metropolis.

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However, Bangkok's northern neighborhoods were not the only areas affected by this large-scale natural disaster. Many municipalities in Bangkok's nearby provinces were also badly damaged and, in some areas, the flood level was considerably higher than in Northern Bangkok. Even though flooding had long been a perennial occurrence in the Thai central plains and Bangkok, the Great Flood of 2011 caused damage on an unprecedented and heretofore nearly inconceivable scale in the views of private citizens and government authorities alike.

Yet, amid the chaos and despair, one local community in a province adjacent to inundated Northern Bangkok stood out as a model for natural disaster management. Frequently referred to as the *Pakkred Model*, the flood management strategy employed by the *Nakorn Pakkred* municipality attracted attention from the national government agencies, local authorities, mass media, and the public at large. Left largely untouched by the torrent of flood water that had ravaged Thailand's central plains, *Nakorn Pakkred* municipality offered a potentially instructive counterpoint to the national government agencies whose ineffectual responses had failed to save Northern Bangkok from turning into an inland freshwater lake. Nakorn Pakkred's success in shielding itself from the destructive force of the Great Flood was all the more remarkable, given its location. Situated on the muddy shorelines of the mighty *Chaopraya River* and Bangkok's waterworks canal, the municipality was *particularly* vulnerable to flash floods that drained into the Gulf of Thailand. However, out of 30,000 households in the municipality, only 2,000 were inundated. By contrast, neighboring communities were completely, or nearly completely, submerged by the floods.

Equally remarkable was *Nakorn Pakkred* municipality's ability to cope with the calamity within the parameters of the limited budget and administrative authority granted municipalities by the central government. That is, notwithstanding the decentralization reform policy adopted by the Thai central government, the administrative prerogatives and budgetary resources remain concentrated in the central government agencies, thus severely hindering the ability of local governments to plan for, and respond to, extraordinary situations such as the Great Flood. However, the administrative and budgetary constraints did not appear to hinder the flood management efforts adopted by the *Nakorn Pakkred* municipal government. Not only did the municipal government demonstrate its

capacity to manage the flood crisis, it also demonstrated that it could do so at economical cost; only 150 million Baht (US\$ 5 million) of the public money were spent on the *Nakorn Pakkred* municipality's 2011 flood relief efforts.

Thus it was that Nakorn Pakkred and its *Pakkred Model* of flood management mitigation could be viewed as an object lesson in how to plan for and manage flood crises, *despite* the disadvantages of limited authority, limited autonomy, and limited budgetary resources. However, to fully appreciate the magnitude of Nakorn Pakkred's accomplishments, the municipality's flood-management plans and action had to be juxtaposed against the evolution and current status of local governance policies and practices as these stood at the time of the Great Flood.

**Keywords:** Pakkred Municipality, Disaster Management, Flood, Local Authorities

## การจัดการภัยพิบัติที่ดี: กลยุทธ์ในการจัดการกับปัญหาอุทกภัยของเทศบาลนครปากเกร็ด จ.นนทบุรี

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### บทคัดย่อ

ในเดือนพฤศจิกายน 2554 ได้เกิดมหาอุทกภัยในพื้นที่ภาคเหนือตอนล่าง ภาคกลางตอนบน และกรุงเทพมหานครในบริเวณกว้างมาก ส่งผลให้เกิดความเสียหายทั้งในกรุงเทพมหานคร และปริมณฑล จังหวัดปทุมธานี และนนทบุรี ที่อยู่ทางตอนเหนือของกรุงเทพมหานครได้รับความเสียหายอย่างหนัก เทศบาลนครปากเกร็ดที่มีพื้นที่ติดกับแม่น้ำเจ้าพระยา และคลองประปา ซึ่งเป็นพื้นที่เสี่ยงภัยน้ำท่วมเป็นประจำทุกปีอยู่แล้ว เป็นที่คาดการณ์ว่าคงจะได้รับผลกระทบอย่างหนักในอุทกภัยในครั้งนี้ในบริเวณกว้างและรุนแรงมากกว่าทุก ๆ ปีที่ผ่านมาเช่นกัน แต่จากเหตุการณ์ดังกล่าว ผลปรากฏว่าเทศบาลนครปากเกร็ดได้มีการบริหารจัดการที่ดีในการจัดการรับมือกับภัยพิบัติในครั้งนี้ จนสามารถจำกัดบริเวณที่น้ำท่วมลงได้สำเร็จ รัฐบาลและสื่อมวลชนตลอดจนประชาชนทั่วไป กล่าวขานถึงต้นแบบของการจัดการภัยพิบัติในครั้งนี้ให้เป็นต้นแบบขององค์กรปกครองส่วนท้องถิ่นอื่น ๆ ว่า “ปากเกร็ดโมเดล” ที่โด่งดังในระดับประเทศ

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## Overview of the Evolution of the Thai Municipal Government

### *Genesis of Municipal Government in Thailand*

In Thailand, the emergence of municipal government system (*Thesaban*) had paralleled that of the modern public administrative system. Thai leaders in the late nineteenth century adopted Western administrative models, primarily the British and French colonial practices, to reform the country's traditional administration (Unger, 2003; Phongpaichit & Baker, 2005). King Rama V (1868-1910) initiated the *Chakkri* Reformation—the administrative reform movement that transformed the traditional administrative structure to a collection of functional bureaucratic agencies. The initiating 19<sup>th</sup>-century aristocratic reformers, as well as their military and bureaucratic successors in the Constitutional Monarchy era, were primarily concerned with the stabilization of the country's macroeconomic health and consolidation of territorial control. To these ends, centralizing every aspect of governance was viewed as the most effective mechanism to strengthen Bangkok's administrative influence over the provinces and municipalities.

Among the European administrative practices that were fashionable in the British colonies, aristocratic leaders of the *Chakkri* Reformation<sup>1</sup> era experimented with the municipal government system first, in Bangkok in 1897. The reformers referred to Bangkok's municipal government as *Sukhaphiban* or sanitary district which was responsible for trash collection, sewage management, and slaughterhouse inspection and licensing. In the first decade of the twentieth century, the *Chakkri* reformers institutionalized the sanitary district system by propagating the Local Government Act in 1914 and established more sanitary districts in the Greater Bangkok area and in select other parts of the country, charging them with the same service responsibilities as the Bangkok sanitary district (Jansen & Khannabba, 2009). Yet, despite the attempt to develop local government capacity, the *Chakkri* reformers restricted the scope of responsibilities for the sanitary districts and placed them under the centralized bureaucratic supervision of the Department of Provincial Administration—one of the most powerful administrative agencies in the Ministry of Interior. After King Rama V's death, a major disruption of the development of municipal self-government occurred when King Rama V's successor abolished the sanitary district system.

### *Thai Municipal Government in the Post-Absolutism Era*

Following the end of royal absolutism in 1932, the municipal government issue resurfaced and took the center stage of political and administrative development. The post-absolutism regime consisting of high-echelon bureaucratic and military officials enacted the Public Administration Act of 1932 and the Municipality Act of 1933. The former divided the country's administrative structure into national, provincial, and local levels—all of which had remained largely intact until the present day (See Figure 1). The latter established municipal governments in the urban areas and upgraded several sanitary districts that were abolished during King Rama VI's reign to the municipality status. The responsibility and authority for controlling and supervising coordination among these different regional and local government units rested with the Department of Provincial Administration in the Ministry of Interior. Consequently, the central-local relations after 1932 did not deviate much from the version that pertained under absolutist rule: The provincial administrative structure continued to mimic the British colonial apparatus designed for effective control of rural areas (Arghiros, 2001).

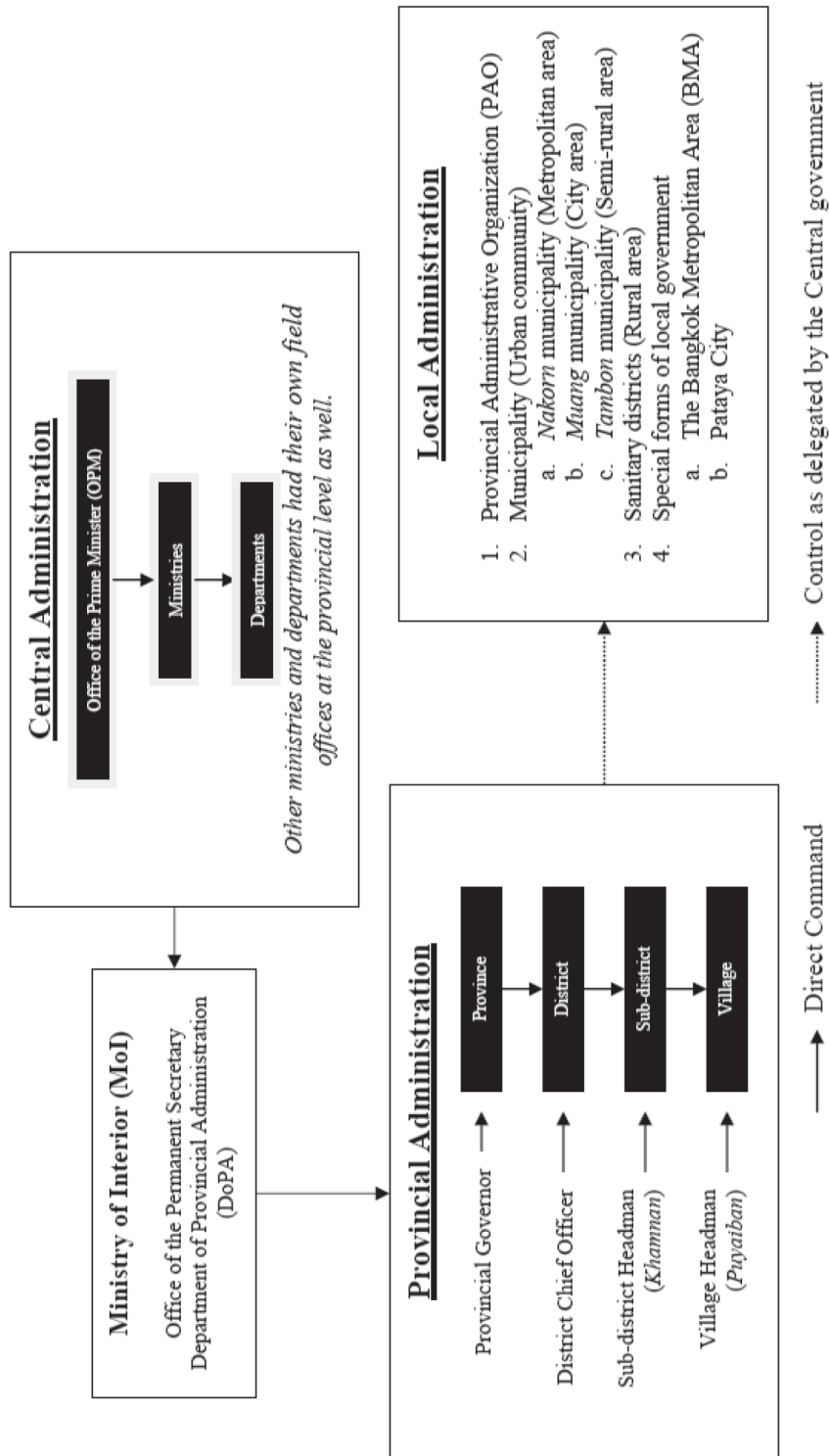


Figure 1: Territorial Structure of Thai Administrative System before the 1997 Decentralization Reform

In 1953, the Thai parliament enacted another piece of legislation to replace the Municipality Act of 1933. The 1953 law divided Thai municipalities into 3 categories based on population size and density. If a municipality had more than 50,000 residents, it qualified as a “metropolitan municipality” (*Thesaban Nakorn*). If a municipality’s population size was between 10,000 and 50,000, it was deemed a “city municipality” (*Thesaban Muang*). For municipalities with fewer than 10,000 residents, the elevation to “sub-district municipality” (*Thesaban Tambon*) required a royal charter. Apart from delineating the structure of municipal government, the law also dictated a range of administrative responsibilities for all municipalities. Effectively, then, municipal governments in Thailand were practically creatures of the national government whose agencies exercised monopolistic control over almost all aspects of municipal administration (Raksasataya, 1995). Among other outcomes, Bangkok’s nearly absolute influence over municipalities manifested itself in an isomorphism of the mayor-council form of municipal government across the country, in the identical term limits for mayors and municipal council members, and in the extent of authority that each provincial governor could exert in overseeing municipal government affairs.

Over the years, however, Thai municipal governments’ limited autonomy and scope of responsibilities troubled many public administration scholars and practitioners. Empirical research revealed that from the 1950s to the 1990s, the allocation of functional responsibilities and budgetary resources among various levels of government was poorly managed; the central government and provincial authorities assumed responsibility for essential public services, while leaving unimportant functions to the municipalities (Chardchawarn, 2008). For example, central and provincial administrations were responsible for education, public health, agriculture, tourism, communication and transportation, and industry and commerce. Municipal governments, on the other hand, were assigned minor sanitary functions, such as street cleaning, garbage collection, slaughterhouse inspection, fresh market management, and maintenance of cemeteries and crematoria.<sup>2</sup> This increasingly worrisome state of affairs would soon become a topic of debate as part of the emergence of the movement for greater democratization and decentralization that arose as the twentieth century drew to a close.

### *Thai Municipal Government in the Decentralized Governance Era*

The process of territorial decentralization in Thailand officially began with the promulgation of the 1997 constitution. However, as earlier intimated, the demand for decentralization took shape several decades prior. In the 1950s and 1960s, several efforts were mounted to induce self-governance in the rural areas, albeit to no avail. But, in the aftermath of the 1973 pro-democracy movement against the military-dominated government, Thai academics had begun forcefully arguing in favor of decentralization and promoted it as a means to nurture participatory governance at the local level (Morelle & Samudvanija, 1981). However, the dearth of public enthusiasm about local self-governance forestalled the idea of decentralization from gaining further momentum.

The shift in Thai public opinion towards decentralization occurred as Thailand –having sought the World Bank’s financial assistance amid the early 1980s economic recession -- agreed to the Bank’s structural adjustment program that included the prescription of greater decentralization (Nagai, Kazuyo, & Kimata, 2007). Nevertheless, the shift in the public opinion was not dramatic enough to pressure the central government to abandon its centralized control over local governments. Not until the 1990s did a confluence of factors trigger real changes in Thailand’s central-local relations. First, the spirit of democratization that had developed in many parts of the world during the preceding decade reached Thailand in the early 1990s. The 1991 military coup d’état and the junta’s reluctance to give up control proved fateful, inasmuch as they bolstered the pro-democracy movement and convinced the urban middle class, particularly in Bangkok, to stage street protests against military authoritarianism in May 1992. Thus, the landscape of Thai administrative politics altered significantly after the 1992 pro-democracy movement. Whereas heretofore, the central government bureaucracy, led by the Ministry of Interior, played an almost insuperable role in determining the policies and programs concerning provincial and local administrations, beginning in the 1990s, the interior ministry’s political clout gradually faded to the point where the ministry found itself reduced to colluding with provincial politicians and national parliamentarians in order to preserve its organizational interests.

The efforts to revamp the country’s administrative structure culminated in the ratification of the 1997 constitution. For the first time

in Thai history, local self-governance was enshrined in the Supreme Law of the Land. However, as was the case in all developing countries, translation of the constitutional principles into practice was an ongoing problem. The government agency that was put in charge of implementing the decentralization reform programs was the very one that would be most negatively affected by the reform. Further, incentives to expedite the reform process were largely absent (Unger, 2003). As a result, the decentralization reform progress was ploddingly slow; everything concerning the country's administrative and territorial structures remained largely intact, particularly the provincial administrative structure (See Figure 2). Perhaps nowhere was this more evident than in the central government's retention of the authority to appoint and rotate provincial governors.

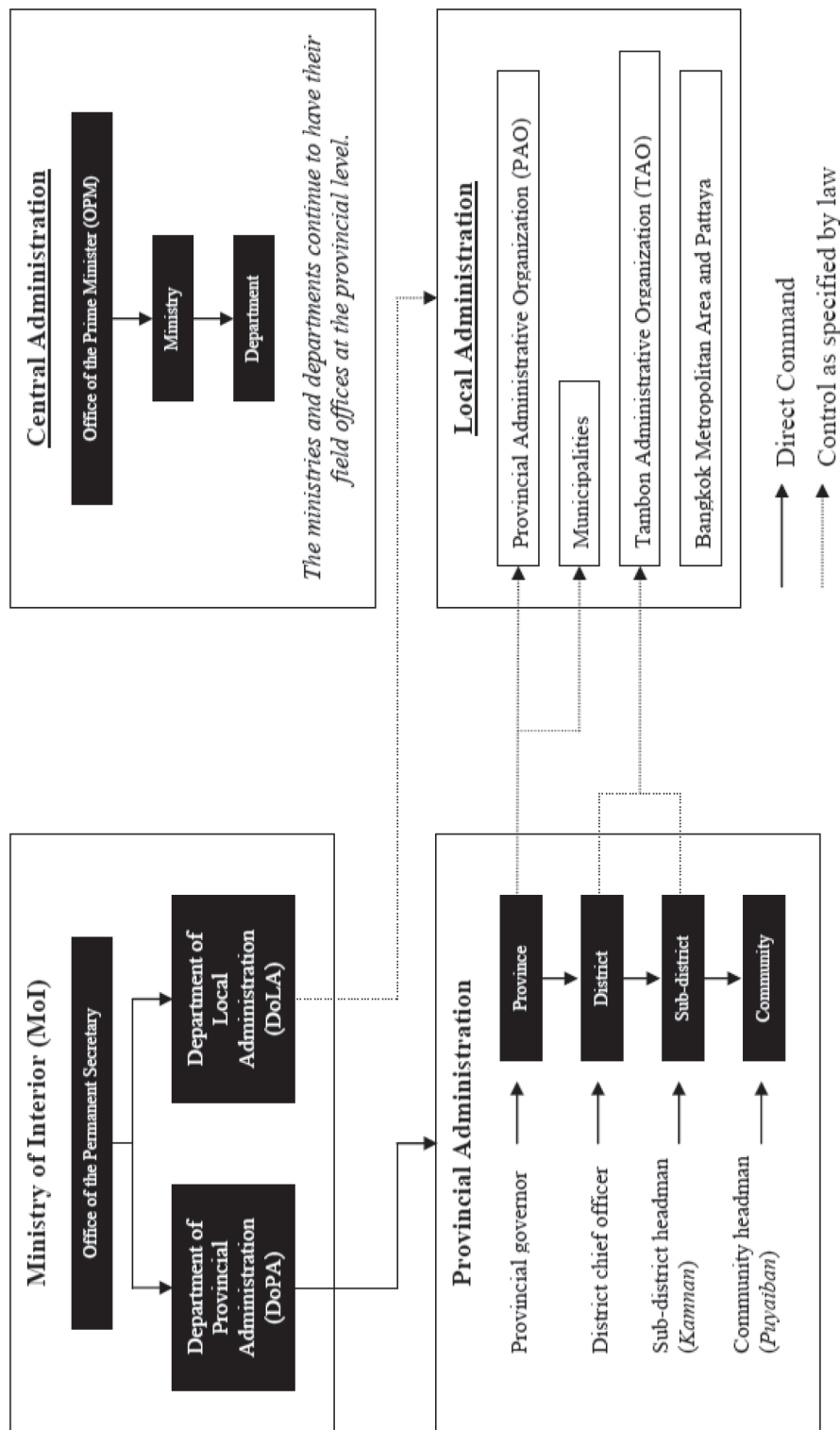


Figure 2: Territorial Structure of Thai Administrative System after the 1997 Decentralization Reform

In fact, only three significant changes arose out of the decentralization reform movement. First, the number of local governing bodies doubled from 1996 to 2006. Second, all Thai municipal mayors (*Nayok Tesamontri*) were now popularly elected and enjoyed more political autonomy from the municipal councils than they had prior to 1997. Third, in the decentralized governance era, municipal governments were vested with more functional responsibilities. The law specified both compulsory and optional functions for municipal governments (See Table 1). In the past, certain functions -- such as educational services (e.g., primary schools and vocational colleges) and public health -- had been reserved for the central and provincial governments. However, municipal management of these functions was still in its early stages of development, with some of these functional responsibilities still being in the nature of unfunded mandates. Often, the municipalities' own source of revenues did not match their mandated duties and expenditures. They had to rely on intergovernmental transfers from the interior ministry or loans from the Municipal Development Fund administered by the ministry to finance their operations. Moreover, instead of using explicit formula and standard cost-benefit analysis, the ministry's allocation criteria were heavily politicized (Mutebi, 2005).

Table 1: Compulsory and Optional Responsibilities of Thai Municipalities

<i>Tambon Municipality</i>	<i>Muang Municipality</i>	<i>Nakorn Municipality</i>
<u>Compulsory Services</u> <ol style="list-style-type: none"> <li>1. Maintenance of law and order</li> <li>2. Provision and maintenance of roads/sidewalks, public space, and refuse and trash disposal</li> <li>3. Prevention of infectious diseases</li> <li>4. Fire protection</li> <li>5. Education</li> </ol>	<u>Compulsory Services</u> <ol style="list-style-type: none"> <li>1. Maintenance of law and order</li> <li>2. Provision and maintenance of roads/sidewalks, public space, and refuse and trash disposal</li> <li>3. Prevention of infectious diseases</li> <li>4. Fire protection</li> <li>5. Education</li> <li>6. Clean water</li> <li>7. Slaughterhouse inspection</li> <li>8. Community medical centers</li> <li>9. Public restrooms</li> <li>10. Street lights</li> <li>11. Drainage</li> </ol>	<u>Compulsory Services</u> <ol style="list-style-type: none"> <li>1. Maintenance of law and order</li> <li>2. Provision and maintenance of roads/sidewalks, public space, and refuse and trash disposal</li> <li>3. Prevention of infectious diseases</li> <li>4. Fire protection</li> <li>5. Education</li> <li>6. Clean water</li> <li>7. Slaughterhouse inspection</li> <li>8. Community medical centers</li> <li>9. Public restrooms</li> <li>10. Street lights</li> <li>11. Drainage</li> <li>12. Other public health and social services</li> </ol>

(Continued on following page)

Table 1: Compulsory and Optional Responsibilities of Thai Municipalities (continued)

<i>Tambon Municipality</i>	<i>Muang Municipality</i>	<i>Nakorn Municipality</i>
<u>Optional Services</u> <ol style="list-style-type: none"> <li>1. Provision of market, ferry, and harbor facilities</li> <li>2. Maintenance of cemeteries and crematoria</li> <li>3. Provision of employment benefits</li> <li>4. Commercial development</li> <li>5. Clean water</li> <li>6. Slaughterhouse inspection</li> <li>7. Community medical centers</li> <li>8. Drainage</li> <li>9. Public restrooms</li> <li>10. Street lights</li> </ol>	<u>Optional Services</u> <ol style="list-style-type: none"> <li>1. Provision of market, ferry, and harbor facilities</li> <li>2. Maintenance of cemeteries and crematoria</li> <li>3. Provision of employment benefits</li> <li>4. Commercial development</li> <li>5. Provision and maintenance of hospitals</li> <li>6. Other necessary public utilities</li> <li>7. Sport stadiums and wellness centers</li> <li>8. Vocational schools</li> <li>9. Public parks and zoos</li> <li>10. Other public health services</li> </ol>	<u>Optional Services</u> <ol style="list-style-type: none"> <li>1. Provision of market, ferry, and harbor facilities</li> <li>2. Maintenance of cemeteries and crematoria</li> <li>3. Provision of employment benefits</li> <li>4. Commercial development</li> <li>5. Provision and maintenance of hospitals</li> <li>6. Other necessary public utilities</li> <li>7. Sport stadiums and wellness centers</li> <li>8. Vocational schools</li> <li>9. Public parks and zoos</li> <li>10. Other public health services</li> </ol>

Source: Mutabi 2005, 21.

Thus it was against this backdrop of the devolution of responsibility for local governance to the municipalities -- but with as-yet unfunded mandates and politicized grant allocation criteria -- that government authorities in municipalities such as *Nakorn Pakkred* had to contend as they strove to promote the general welfare of their local constituents and execute the central government mandates. Given the continuing reality of the balance of authority and power between central and local authorities, as well as funding limitations, municipalities such as *Nakhon Pakkred* were certain to continue to experience a complex working environment. Exactly *how* complex would be made evident as the Great Flood of 2011 came upon them? Success in protecting local communities in the face of rising flood waters would clearly necessitate some careful treading along the central-local government axis, along with considerable ingenuity, creativity, and leadership – as the story of Nakhon Pakkred amply illustrated.

## ***Nakorn Pakkred* Municipality and Its Flood-Prone Location**

### *Origin of the Nakorn Pakkred Municipality*

The *Nakorn Pakkred* municipality was formed first as the *Pakkred* sanitary district in 1956 by the Ministry of Interior's ministerial order. Located on the western bank of the *Chaopraya* river, *Nakorn Pakkred* encompassed 5 subdistricts and 34 villages. Because a collection of these communities was on the outskirts of the Bangkok metropolitan area, the capital city's economic dynamism accelerated the *Pakkred* sanitary district's urban growth. After 1956, the *Durian* plantations in the sanitary district were rapidly transformed into industrial estates, while the geographically sparse residential areas became highly congested. As a result of increased urbanism, the *Pakkred* sanitary district was elevated to a *Sub-district* municipality in 1992 and a *City* municipality in 1995. Then, after the ratification of the 1997 constitution and in consequence of the community's unabated growth, the *Pakkred City* municipality was granted a *Nakorn or Metropolitan* municipality status.

With over 30,000 residential households, *Nakorn Pakkred* had become one of Bangkok's vital suburban communities. However, despite its economic vitality, the municipality was situated in a flood-prone area, with the *Chaopraya River* to the west and Bangkok's waterworks canal to the east (See Figure 3). Because of its location, flooding was an annual problem, especially during the country's rainy season (May-October). Given this

reality, preparation of a floodplain management plan was practically *de rigueur*, if the municipality was to avert massive destruction during a particularly heavy flood season. However, preparing a such a plan was a daunting task for the *Pakkred* residents and municipal government officials who had to operate with limited financial and technical resources, while trying to minimize the impact of the perennial flooding.



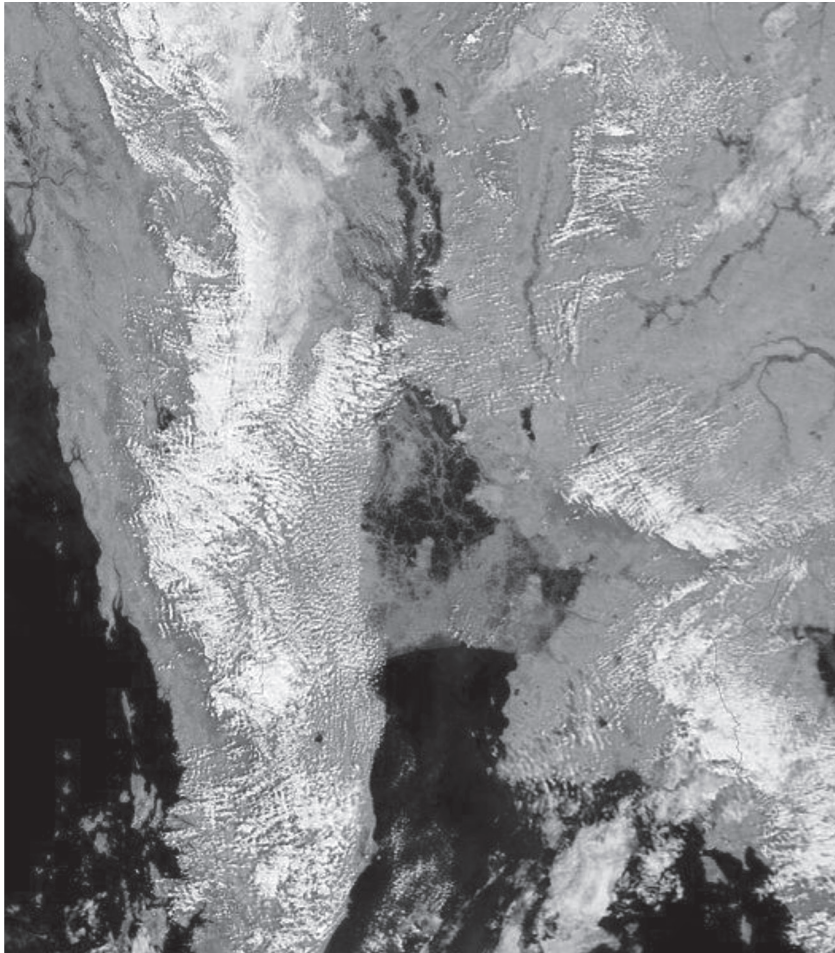
Figure 3: Map of Nakorn Pakkred Municipality

#### *Perennial Flood Problems in Nakorn Pakkred Municipality*

*Nakorn Pakkred* municipality had encountered flood crises on an annual basis. Prior to the 2011 Great Flood that wreaked havoc on central Thailand, *Nakorn Pakkred* had last been severely inundated in 1995, when a large volume of rain water from Northern Thailand caused the *Chaopraya River* to overflow. At that time, the water level rose to 1-2 meters (3-6 feet), submerging entire neighborhoods along the shores of *Chaopraya River*.

Less than twenty years later, the inundation scene repeated itself, as the 2011 monsoon season brought heavy rains and four tropical storms to the northern and central regions of Thailand in the months of May-September. Residents of Thailand's central plains were familiar with heavy rains and flash floods during this time of the year. However, the 2011 Great Flood soon became the worst natural disaster to hit Thailand in modern times,<sup>3</sup> causing economic damages and losses estimated by the World Bank to be 1,425 billion baht (US\$ 45.7 billion).

A glimpse of the large-scale flood disaster to come was seen in May when two large dams in the North—the Bhumibol and Sirikit dams—had begun continually discharging a huge volume of water to compensate for the unusually high incoming flow of water (Hirunard, 2011). By mid-September 2011, all lower central provinces were affected by the flood. By the end of September and the start of October, a combination of broken sluice gates in various parts of the *Chaopraya River* and heavy rainfalls worsened the flood situation, resulting in the inundation of Bangkok's suburban residential areas and industrial estates (See Figure 4). By mid-October, floodwaters drained towards Bangkok's metropolitan areas and breached flood barriers that were built to protect manufacturing factories, mainly automobile factories. The breakage of flood barriers, overflowing of the irrigation canals around Bangkok, and a huge amount of floodwaters from the North swallowed up the northern neighborhoods of Bangkok. Temples, mosques, churches, hospitals, schools, public universities, convenient stores, and all private residences were completely under water by the end of October.



**Figure 4: Map of Thailand's Central Plains during the Great Flood of 2011**

*Floodwater in Motion, Municipal Government in Action*

But for the proactive and continuing actions of local government officials in *Nakhon Pakkred*, led by Mayor Wichai Bandasak, the municipality might well have suffered the same sad fate as nearly all of the communities in its geographic sector. However, as fate would have it, in Mayor Wichai and his local government staff, the flood waters met their nemesis.

Both the executive and legislative branches had agreed on the importance of preparing their municipal community for the 2011 monsoon season. To wit, on August 6, 2011, Mayor Wichai Bandasak, presciently surmising that the community was about to experience one of those once-

in-century flood disasters, ordered the Public Works Department to construct flood barriers along the *Chaopraya River* shorelines, prepare sandbags, dredge flood canals, and install water pumps at flood-sensitive locations. Just as proactively, the municipal council had approved the flood preparation plan and budget several weeks prior. Additionally, one week after flood preparation plan began, one of the municipal council members proposed that the council give the mayor 9 million baht to execute all the necessary measures to protect the *Pakkred* communities from the overflowing *Chaopraya*.

Further, with total rainfalls in Northern Thailand since May 2011 having been abnormally high, and with the *Chaopraya River*'s water levels set to brim over in many of the Central plains provinces through which it ran, Mayor Wichai also took the precaution of advising all local residents who lived near the river and the waterworks canal to keep abreast of all flood-related news and announcements and to be prepared to move out of their residences. A flood prevention and mitigation office was formed and could be reached at several toll-free numbers.

An important strategy to resolve the flood problems was to drain the flood waters into the Gulf of Thailand as quickly as possible. Unfortunately, the Nakorn Pakkred municipality was not equipped with a comprehensive flood water management system. As Mayor Wichai opined:

*... Solving the perennial inundation problems in the areas near the Chaopraya River requires long-term planning and serious investment. This year's flooding is particularly acute due to unusually large volumes of storm water run-off. The direction and exact amount of the water run-off are difficult to predict, let alone manage. The absence of sturdy dams on the river banks is likely to worsen the situation. What we can do at this point is to keep the flooded areas to a minimum.*

The municipality's alternative strategy was to make use of all canals in the area that could be turned into floodways. Mr. Wirat Bandasak, one of *Nakorn Pakkred*'s deputy mayors, was put in charge of searching for and dredging all the canals. *Klong Suay*—a major floodway several decades ago and one of 14 canal-dredging projects on the deputy mayor's "to-do-list" — was found to be full of solid waste and water weeds, making it practically impassable. The deputy mayor ordered the Public Works

Department to dredge it without delay, in order to get it ready to quickly drain the flood waters into the Gulf of Thailand.

In addition, three other strategies were put in effect -- including activating the emergency beacon system, storing sandbags, and putting up sandbag barriers along the *Chaopraya River* shorelines. The emergency beacon system was set up to inform *Nakorn Pakkred* residents in the flood-sensitive neighborhoods to evacuate to higher ground if the makeshift barriers failed to halt the water from overflowing the river banks. On October 9, 2011, an emergency message on the municipality's webpage read:

*The municipality set up an emergency beacon system for all those living near the Chaopraya River. If the flood situation is getting beyond our control, an emergency beacon will be activated to let everyone in the flood-sensitive communities to evacuate to our municipality's shelters. If local citizens have more questions, please contact the municipality's flood mitigation and prevention center at 02-583-7788 or 1132.*

Meanwhile, the municipal government workers were engaged to help local residents prepare sandbags and construct makeshift flood barriers around private residences, temples, and open-air markets. In many locations, the municipal workers and citizens built flood control walls from any materials that they could gather (e.g., brick, stone, sand, etc.). Local residents in some neighborhoods used sandbags to construct barriers along the main roads to protect their transportation routes.

These proactive measures could not have been more timely. As all the preparation phases were finished, the flood situation in the nearby provinces worsened appreciably. The volume of storm water run-off was beyond anyone's expectation. Consequently, as an additional precaution, on October 10, 2011, Mayor Wichai announced that he had ordered the Public Works Department to raise the makeshift flood-control walls along the *Chaopraya* and the Bangkok waterworks canal. Even then, however, he was not one-hundred-percent confident that the temporary flood-control walls would be sturdy enough to handle the surge of runoff water from the North. Hence, as yet another precaution against the collapse of the flood-control walls, all *Nakorn Pakkred* residents were advised to move forthwith to two municipal schools that had been turned into temporary shelters.

In addition to mobilizing resources within the *Nakorn Pakkred* municipality, Mayor Wichai also collaborated with Mayor Somnuk Thanadechakul of the adjacent *Nakorn Nonthaburi* municipality, which was located in the same flood-prone areas on the *Chaopraya River* banks. In adopting the flood prevention strategies similar to those used by the *Nakorn Pakkred* municipality, Mayor Somnuk also made sure that an inter-communal conflict between the two municipalities did not occur. In other flood water-besieged areas, residents in one municipality had destroyed the flood-control walls constructed by residents in a different municipality, thereby causing the floodwaters to damage both municipalities. Determined to avoid a similar situation in their municipalities, the mayors of the *Nakorn Pakkred* and *Nakorn Nonthaburi* worked together closely between May and November 2011 to ensure peaceful collaboration between their two communities as they dealt with the flood crisis. Their collaborative measures included sharing monetary resources, constructing the flood-control walls of the same height, and putting both municipal workers and villagers to work together in preparing sandbags to construct temporary flood barriers.

### **The *Pakkred* Model: Effective Strategy for Natural Disaster Management**

While other areas of Bangkok and its nearby provinces were waterlogged, much of the *Nakorn Pakkred* municipality remained dry. The flood-free community was an unusual case, considering its flood-prone location and the irregularly high rainfalls in 2011. Not to be overlooked was what made the *Nakorn Pakkred* municipality unusual: The community's long-term preparation for natural disasters.

#### *Tough Lessons from the Previous Flood and the 2011 Emergency Management Plan*

During the 1995 flood crisis, *Nakorn Pakkred's* western neighborhoods were completely underwater for several weeks. This proved to a valuable lesson, learned the hard way, for residents and officials alike. After the floodwaters receded, a series of workshops were organized by the municipality to identify and assess the *Nakorn Pakkred* community's weaknesses. Three flood prevention measures arose and were implemented from these workshops and were systematically implemented over the several years prior to the 2011 flood. First, drainage canals were constructed

beneath all main roads in the municipality and connected to the *Chaopraya River* or other large irrigation canals in the municipality. Second, multiple water pumps were installed at various sites, particularly the low-elevation areas near large drainage canals. Third, the municipal government provided funds for dredging all irrigation and drainage canals in the municipal areas.

As a result of these three measures, the *Nakorn Pakkred* municipality currently operated 17 water pump stations and 23 water retention ponds—all of which work in concert to control the water level in canals that are connected to the *Chaopraya*. Between August and September 2011, the municipal government was also working on turning 14 old floodways into water retention ponds and drainage canals. Further, in cutting the cost of constructing permanent flood barriers, the municipality raised the height of roads that could serve as flood-control walls by 1-2 meters. The height of the *Pakkred* pier—the municipality's largest pier—was also raised by 2-2.50 meters.

From 1995 onward, the *Nakorn Pakkred* flood management plan had been reviewed on an annual basis. Every year the municipal government set aside money for an emergency fund and executed a comprehensive emergency management plan that spelled out the standard operating procedures and responsibilities for each municipal government department. Such plans were made effective for the period, July—December, the monsoon season in central Thailand.

The 2011 monsoon season was however different from monsoon seasons in years past. Four consecutive tropical storms resulted in unusually high, indeed unprecedented, total rainfalls. Mayor Wichai was well aware of the potential consequences of this natural phenomenon:

*... Our municipality began our planning process [for flood prevention and management] several months earlier this year because we were certain that the Royal Irrigation Department would definitely discharge high volumes of water from the Bhumibol and Sirikit dams. On top of this, our municipality is situated in low-elevation areas. We had to carefully plan how to handle such large amount of water. In fact, we do have a long-term flood management plan and an emergency management plan for each year's monsoon months. But,*

*given this year's extraordinary circumstances, we had to come up with a systematic plan to save our community from this year's deluge...*

*Nakorn Pakkred's 2011* municipality's planning process began with a thorough assessment of the 2011 monsoon season's total rainfalls and the flood situation in Northern Thailand. After receiving the situation assessment report, Mayor Wichai and his administrators held meetings to analyze each municipal government department's functional responsibilities. Afterwards, an emergency operation center for flood and storm was established and placed directly under the mayor's office. While the center was in operation only between May and December, two local branches were open at *Hong Thong* Temple and *Chong Lom* Temple to provide municipal residents with easy access to all the assistance they might need<sup>26</sup>. The mayor also appointed a group of several high-ranking municipal officials to serve as the management committee for the emergency operation center. The committee possessed 8 responsibilities, as illustrated in Figure 5.

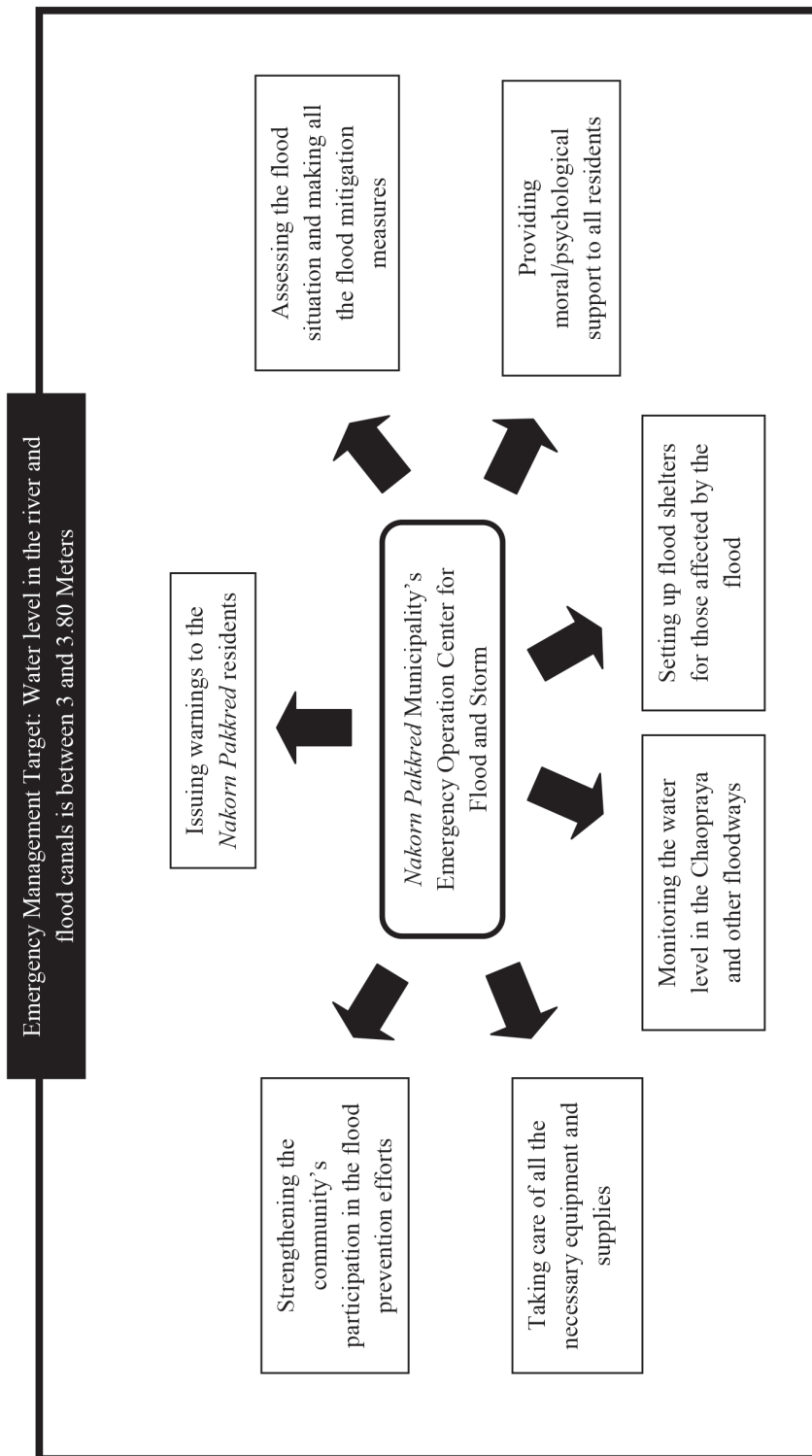


Figure 5: Functions of the Nakorn Pakkred Municipality's Emergency Operation Center

*Flood Mitigation Strategy for Residential Areas outside the Flood-control Barriers*

One of the flood-related issues that could not be taken lightly was the potential intra-communal conflict between local residents whose houses were protected by the flood-prevention barriers and those living outside the barriers. The management committee of the *Nakorn Pakkred* emergency operation center came up with a comprehensive plan to help the local citizens who resided outside the flood-control walls. Ambulance trucks, medical personnel, psychiatrists, food supplies were available in the “dry” areas of the municipality. Affected local residents, including those from the adjacent districts in Bangkok, were permitted to use all the emergency services provided by the municipal government.

At the end of October 2011, it became obvious that the national government had utterly failed to manage the water run-off from the North. In light of that failure, the *Nakorn Pakkred* emergency operation center sent electricians to assist local residents outside the flood-control walls in raising the height of the power outlets in the walls. Public works personnel also were engaged to help residents move their belongings to higher ground to minimize the flood damage. Residents who followed the evacuation order were put in the municipal government shelter and received free hot meals for the entire duration of their stay. When certain local residents refused to abandon their flooded homes and businesses, Mayor Wichai went to talk to those residents personally to offer them financial assistance in an amount equal to their foregone business incomes. However, this financial assistance was provided only for those whose residences blocked the construction of flood-control barriers.

In taking care of the people who lived outside the flood-prevention walls, members of the emergency operation center’s management committee pointed out that:

*The mayor went to see the people in the flooded areas on his own. Mayor Wichai made it clear to everyone involved in the emergency operation center that those living outside the flood-control walls were willing to sacrifice their properties and personal belongings for the municipality’s safety. For this reason, the municipality’s emergency operation center must*

*take good care of those people, making sure that their quality of life is not compromised by the flood situation.*<sup>4</sup>

Despite the damage on their properties, affected residents did not complain much about the municipal government's use of their neighborhoods as the water retention areas. One of these residents who chose to stay at the municipality's shelters pointed out that he did not mind staying at the temporary shelter because everything was provided for. Even the residents who decided to stay at their flooded homes were generally satisfied with the municipality's assistance.

*The municipal authority sent people to deliver food, drinking water, and medicine several time[s] in one day throughout the inundation period. In the case of medical emergency, the emergency operation center contacted the Royal Thai Army and used the military truck to move critically ill people to hospitals. Apart from this, the municipal government workers constructed wooden bridges at multiple locations and were always available to help us. And because of the municipal government's dedicated services, we were willing to help the municipality by allowing our residential areas to be the only flooded areas. The municipal government rightly said that if we only thought of our own welfare and let the entire Nakorn Pakkred become submerged, nobody would be able to help us.*<sup>5</sup>

#### *Nakorn Pakkred Municipality's Decisive Budget Allocation*

The Nakorn Pakkred's emergency operation center and its related activities cost approximately 150 million baht, which came directly from the municipality's reserve fund. On September 30, 2010, there were 648.3 million baht in the municipal government reserves. Thai municipal government finances were strictly regulated by the Ministry of Interior pursuant to the 2004 ministerial code of municipal government finances. Under this ministerial code, although a municipality's discretion over its governmental fund and intergovernmental transfers was limited, each municipality was given the ultimate authority and autonomy to manage its own reserve fund. Thus, Nakorn Pakkred's large reserve fund was an important factor determining the municipality's effective flood management.

Where did this huge reserve fund come from? The director of the *Nakorn Pakkred* municipality's financial management office recounted that: *"Since 1995, the municipal government has been setting aside money for the flood management plan. However, due to the unusually large volumes of floodwaters in 2011, the flood management fund was insufficient. We had to dig into our municipal reserves."* The 150-million-baht amount was deemed highly cost-effective, considering that 28,000 households (out of 30,000 households) remained completely dry throughout the 2011 flood ordeal. Without the *Nakorn Pakkred* municipality's flood management plan, in all probability, damages to the residential, business, and industrial areas would have been astronomical.

#### *Leadership Quality and Extensive Political Network*

Much was said about the *Nakorn Pakkred* mayor's roles in his municipal government's flood management efforts. Both during and after the 2011 flood crisis, Mayor Wichai was interviewed countless times by news reporters, academicians, national government agents, and political science students. The remarkable quality of his leadership during times of crisis was much discussed. Most observers averred that his extensive knowledge of the flood situation, his decisiveness, and his sense of responsibility greatly contributed to the effectiveness of the *Nakorn Pakkred* municipality's emergency operation center. A high-ranking municipal government official stated that:

*... Mayor Wichai possesses many leadership qualities. He understands all his subordinates' talents and is always eager to make the best use talented people. The mayor is also willing to take risks. For instance, when the municipality needed bricks, sand, and cement to build flood-control barriers between July and September, it was the mayor who went to convince the private vendors to let the municipality reimburse them for the materials later. The purchase of those construction materials normally has to go through time-consuming approval procedures, which could have affected the flood prevention plan. Mayor Wichai is well aware of the purchase procedures and tried to expedite the process. But, in the end, he had to use his personal connections to persuade the private vendors to agree with the reimbursement plan.*<sup>6</sup>

Not only did the concept of leadership denote excellent intra-organizational skills, it also encompassed an ability to manage public opinion and behavior. The flood management plan in particular required a lot more than the organizational management know-how. Had the people affected by the flood gone against everything that the municipality was trying to do, today the *Nakorn Pakkred* municipality would be known differently, i.e., as yet another one of Bangkok's suburban communities that got severely ravaged by the Great Flood of 2011. On the contrary, as one of his deputies recounted, Mayor Wichai's good public relations skills played a major role in the outcome:

*. . . The mayor was very concerned about the people whose houses are outside the flood-control barriers. He ordered us to conduct a survey of how much income the flood victims lost as a result of the floods. Afterwards, each affected household received a reasonable amount of financial assistance from the municipal government's emergency management fund. For those who chose to move to the municipal government shelters, Mayor Wichai told everyone to take good care of the evacuees, indicating clearly that the evacuees had to live as comfortably and conveniently as in the normal circumstances. According to the mayor, these measures played an important role in making sure that people living outside the flood-control walls were not poised to destroy the walls . . .<sup>7</sup>*

#### *Public Participation: Making Flood Management Plan Work*

Another important aspect of the *Nakorn Pakkred* municipality's disaster prevention program was the level of public participation in each preparatory phase of flood management. The degree of "social capital" within *Nakorn Pakkred* during the 2011 monsoon season was remarkable. Everybody in the municipal community was involved in every activity. Monks, teachers, and people from all walks of life congregated at various locations to prepare sandbags and/or build flood-prevention walls. When the floodwaters invaded other nearby communities, temples and public schools were turned into flood-related information centers that helped disseminate information about the municipality's evacuation plan and temporary shelters to the flood victims.

The municipal government's public relations policy was already clear at the beginning of the flood prevention process. Mayor Wichai explained that:

*The municipality's flood prevention plan actually began with informing community leaders, local educators, religious leaders, and business owners of the importance of the flood prevention plan. I reminded them all that each of us could play an important part in the flood management efforts. First, they must move all their belongings to higher ground and build sandbag barriers to protect their houses, especially those living near the river and canals.*

The mayor also placed emphasis on the quality and timeliness of flood-related information. The municipal government's information center was set up in June, which was four months prior to the inundation of Bangkok and its suburb. The information center was quite effective, considering the local citizens' understanding of the need to construct flood-control walls around the municipality.

Equally remarkable was the sense of camaraderie and shared sacrifice that was facilitated by public participation and ongoing access to flood-related information. One citizen commented:

*My house was protected by the flood-control walls, so I felt bad for people whose houses were on the other side of the walls. [Those] people made an enormous sacrifice for the entire community by letting their residential areas become the water-retention area. And out of my appreciation of their unselfishness, my family was willing to do our best to help those victims at the shelters. We donated food and clothes for the flood victims and also helped the municipal government workers prepare sandbags...<sup>8</sup>*

## **A Tale of Effective Flood Management Strategy**

Thus it was that *Nakorn Pakkred* municipality – though situated in a low-elevation, flood-prone area of Thailand's central plains that makes for extraordinary difficulty in handling the torrent of floodwaters in the monsoon months – came through the unprecedented Great Flood of 2011 mostly intact and with great aplomb. In doing so, they had perhaps unwittingly left

for other governmental agencies important lessons concerning the management of natural disasters, such as perennial floods. That this was done in the context of continued limited decentralization of power and constrained funding from the central government made the *Pakkred Model* all the more noteworthy. The only critical question that remained to be answered was whether the lessons available in the *Nakhon Pakkred* experiences in the 1995 and 2011 floods would be embraced and emulated by other municipalities and, in particular, by the central government.

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## Endnotes

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- <sup>1</sup> The Chakkri Reformation (1868-1910) was a series of administrative reforms initiated by King Rama V to modernize the country. The ultimate aim was to ward off the influence and plausible invasion by Western imperialist nations. In the reform process, a Western-style centralized bureaucracy was created to replace the traditional administrative structure modeled after the 12<sup>th</sup>-century Khmer-Brahmin governance system.
- <sup>2</sup> Both Mutebi (2005) and Wongpredee (2007) note that even for this limited scope of responsibilities, municipal governments lacked adequate economic and fiscal foundation and had to rely on transfers and grants from the central government.
- <sup>3</sup> The Emergency Operation Center for Flood, Storm, and Landslide (established by Prime Minister Yingluck Shinnawatra's executive order) stated on January 17, 2012 that the 2011 flood persisted in some areas until mid-January 2012 and that it resulted in 815 deaths and approximately 13.6 million people affected. Emergency Operation Center for Flood, Storm, and Landslide. 2012. Executive Report on Flood, Storm, and Landslide. January 17, 2012. Retrieved March 10, 2012.
- <sup>4</sup> Interview with the Nakorn Pakkred municipality's deputy mayor. February 2, 2012.
- <sup>5</sup> Interview with the leader of one of the communities that were outside the Nakorn Pakkred municipality's flood-control walls. February 4, 2012.
- <sup>6</sup> Interview with the Nakorn Pakkred municipality's financial director. February 2, 2012.
- <sup>7</sup> Interview with the Nakorn Pakkred municipality's deputy mayor. February 2, 2012.
- <sup>8</sup> Interview with a Nakorn Pakkred municipal resident who lived inside the flood-prevention walls. February 4,