Space of Possibilities - Chiang Mai, Thailand

Scored by name(s): Piyapong Boossabong, Chiang May University (piyapong.b@cmu.ac.th) and Pobsook Chamchong
Date: 10/11/2024
Cite as: Boossabong, P. & Chamchong, P. (2024). Space of Possibilities – Chiang Mai, Thailand (GOGREEN Case Report Series No. 17), Roskilde: Roskilde University. ISBN: 978-87-7349-307-6

Is the project a case of…:

☒ State-initiated co-creation

☐ Entrepreneur-driven co-creation

☐ Grassroots-based co-creation*

**For an elaboration of the typology, please consult the GOGREEN theoretical framework p. 25.*

Integrated case analysis

Before proceeding to the scoring of the GFs, please provide a *3–5 page case analysis* in which you describe the background, history, and national, regional, and local contexts of the case, the problems and goals addressed by the local collaboration, the participating actors and their relationships, the unfolding of the co-creation process, the most important governance factors (this may include factors other than those in focus in this project), and the generated outputs and outcomes. The conclusion may specify a few lessons learned from the case study.

1) Background, history, and national, regional, and local contexts of the case

The case emerged in Thailand, a weak democratic country where the military still dominates the system. It started during the peak situation of COVID-19 from 2021 to 2022 at the local level in Chiang Mai. The lockdown led to a food shortage and a dramatic increase in food prices in the city. The situation was even worse when the central fresh food market was found to be the cluster of the outbreak. People here have realized that the existing food system is very fragile as it depends too much on food transportation from a distance (mainly from China). The disruption of food supply chains at that time broke the imagination of the people that food in the city was always abundant. This was particularly the case for fresh vegetables. This problem affected everyone with a severe impact on the disadvantaged groups, including people struggling with homelessness and unemployed migrants.

With that, the think tank unit called Chiang Mai City Lab within the School of Public Policy at Chiang Mai University decided to organize a public forum aiming to connect the dots for boosting mutual support among stakeholders in the city in the face of the crisis as merely food donation was insufficient to address the problem. The initiative was supported by the Office of the National Economic and Social Development Council under its program with UNDP, known as the Thailand Policy Lab. A hundred people from different backgrounds attended the forum. Some were representatives of public, private, educational, and civil society organizations, while the rest were active citizens and disadvantaged groups (a homeless person, young persons with unemployment, and low-income workers). They all thought the city could not wait for

help from the central government and the rigid hierarchical bureaucratic structure within the weak democratic regime.

In the forum, a homeless person shared his fears and hopes in front of everyone. The forum then turned to be a platform for resource sharing when the mayor raised his hand and proposed that he could provide a piece of vacant land covering 70 acres for the people to grow food there. After that, a startup that owns a composting machine agreed to install it in that area to help the municipality to compost the organic waste of 500 kilograms per day. Apart from that, the Chiang Mai Food Council stepped in with a promise that it would take the idea into action by ensuring that everyone can take part. This initiative would take time as food could not be grown overnight. In the meantime, they agreed to connect supermarkets to make the best use of their leftover foods (nearly expired foods) by redistributing them to the people in need.

Right from few weeks after the forum, the abovementioned land has been used as a space of possibilities framed by the bio-circular-green economy approach. The financial resource for the operation (seeding money) was gained from the regional office of the National Innovation Agency (Public Organization). The municipality invested in building the infrastructure for the machine installation and absorbed the cost of electricity. The owner of the composting machine understood that the municipality could not afford to pay for the machine at that point, so he allowed the municipality to use it for the whole year for testing the prototype project. Chiang Mai Food Council has become the main actor that makes the actual change by working with community leaders, people struggling with homelessness, migrant workers, ethnic minorities, and other laypeople in the area. In parallel, Chiang Mai City Lab has played the role of coordinator of this collaborative effort, facilitating co-creative activities and helping to manage the pool resources.

2) The aims of the project and the sustainability problems that it seeks to address

The project aims to enhance food security for the vulnerable people in Chiang Mai, Thailand, by turning food waste into fresh food with the adoption of the bio-circular-green economy approach. In doing so, the project addresses the problems of ineffective city waste management and irresponsible food systems that are dominated by large corporations and produce mainly chemical-contaminated products, which are related to SDG 11 (Sustainable Cities and Communities) and SDG 12 (Responsible Consumption and Production).

3) The participants and their interaction and communication in and between meetings

Participants include Suthep Municipality, Chiang Mai University (Faculty of Agricultural Science & School of Public Policy), the National Innovation Agency (the regional office), the Office of the National Economic and Social Development Council, UNDP, Chiang Mai Food Council, the composting machine owner (a startup), seven community leaders, three persons struggling with homelessness, two migrant workers, four persons from an ethnic minority (Lee Zoo), and roughly fifteen general active citizens (the leading group called itself 'Green Ranger'). Their interaction and communication in and between meetings are shaped by socio-cultural hierarchies that bureaucratic actors and scholars have relatively louder voices than others. Men still have a leading role, and higher trust is still given to seniors. However, the role of project facilitators, including Chiang Mai City Lab and Chiang Mai Food Council, is vital in setting a tone of

co-creation. They refer to the convergent approach to bride the vertical and horizontal relations. For example, homeless persons, migrant workers, and ethnic minorities were encouraged to engage in the meetings. In doing so, technical terms were prohibited. The narratives of "hope" and "wish" were commonly used to welcome everyone in the sense that, with or without expertise, all of us can hope and wish for something. Framed by design thinking, the rest were asked to listen when they started speaking. These other participants were not allowed to judge their ideas but rather offered how public action would help improve their well-being. At first, they looked very nervous, but later, they felt very confident about interacting and became the primary workforce on the farm. One of them even said, "This is my farm".

4) How often do they meet, and do they communicate between meetings?

The weekly meeting is organized informally at the site every Friday after 5 PM. At this informal meeting people primarily discuss farming issues. It is also an occasion for updating news, sharing experiences, consulting, and planning what to do next. The Chiang Mai Food Council, municipal staff, and volunteers usually attend this regular meeting. Apart from this meeting, formal meetings are organized as well (monthly or more), mainly for making important decisions and discussing the direction and resource mobilization of the project among key actors, especially Suthep Municipality, community leaders, the Chiang Mai City Lab, the regional office of National Innovation Agency, and the Chiang Mai Food Council. With these two communication layers, this case is a two-tier co-creation—one between key organizers and one between those involved in practical farming activities.

5) The role and forms of knowledge sharing, coordination and joint problem-solving

Three farming practitioners engaged in this project with their rich practical knowledge to share with the ones who had never done farming before. The young startup, with his technology, also shared the technical knowledge on how to use the machine. He trained seven municipal staff for free to ensure they could operate the innovation without his team standby there. The Faculty of Agricultural Science, Chiang Mai University, stepped in as well by helping to test the quality of the soil and the fertilizer. The concern is only about the value of phosphorus (P) that is lower than 0.5 (0.39), and that would affect growing fruits and flowers. In short, different forms of knowledge were welcome and helped support the project, including local/ practical knowledge, technical knowledge, and scientific knowledge.

Regarding coordination, the Chiang Mai City Lab, alongside the Chiang Mai Food Council, seemed to be the boundary spanners that helped coordinate different actors. While the Chiang Mai City Lab mainly helped connect state actors, the Chiang Mai Food Council had a good connection to the non-state ones. In the case of joint problem-solving, local community leaders seemed to play the most active role as most problems are on the ground (about food production and distribution on the farm).

6) The relation between consensus and conflict and the handling of the latter

The project was driven by some consensus among key players. They agreed in the first place that the city really needed a local food system that ensured the availability of food not too far from the city for vulnerable groups. The new food source should also serve as the food bank in the face of a crisis (like COVID-19 and disasters). However, some conflicting values emerged. The main conflict was to what degree it should be accepted as safe or healthy food. The Chiang Mai Food Council played the primary role in mediating this conflict by referring to the fact that most foods in the city are chemically contaminated.

With the data, everyone should advocate for safer food. Some argued that the soil and the fertilizer might already be contaminated by the toxic heavy metals, as they come from food waste. The Chiang Mai Food Council then responded that we can never call our food the safest, but we can make sure that it is safer than those in the general market.

The second conflict concerns whether the products should be sold at a low price or allocated for free. The idea of selling products is not for profit but rather to ensure that the project is sustainable as it could finance itself in the long run. The open discussion on this issue was helpful as, in the end, different parties agreed that 70% of the products should be sold in the local market, while the rest (30%) would be allocated for free through a food bank. The proportion was set with the condition that it could be changed depending on the situation (food demand). The lower ratio of food allocation for free was actually proposed by the vulnerable groups as the food shortage during COVID-19 had been solved, and some of them could benefit from working on farms and selling the products.

The third conflict was about whether manure needed to be mixed with the outputs of the composting machine. On the one hand, the Faculty of Agricultural Science staff suggested that, with the soil quality, we really needed the manure to ensure productivity. On the other hand, the municipality persists in continuing to do farming without the manure to avoid additional costs. However, the tension between the agricultural scientist and the mayor seems better after the new idea emerged, which is to bring cattle and chickens in as they could produce manure. In doing so, the municipality does not need to invest as it can operate using benefits from selling vegetables. Fattening cattle can also make a good return. This idea has not been implemented yet, but it creates a good tone for maintaining collaboration between scientists and local politicians.

The last one is the conflict of land management, as some community leaders also want to grow flowers. This results from the demand for tourism development and the higher price of flowers than vegetables. The municipality also agreed with this idea by proposing to spare some space for flower production. This conflict touches on the original core value of the project, which was to grow food concerned mainly by the Food Council, the City Lab, and the disadvantaged groups working on the farm. It has not yet been handled as the municipality and those community leaders have still not taken actual action in this regard at this point. They can come back again anytime. It reveals power inequality in this co-creative project as municipality and community leaders seem to have a louder voice than others. At the same time, it shows interdependency as those elites cannot take action themselves without the agreement and implementation of "doers", which are community members, volunteers and disadvantaged groups.

From the above, handling conflicts in this case generally depended on deliberation, especially in the platform of food council meetings. The council, thus, is the main actor that helps mediate joint problem-solving. Key policy scholars from the City Lab are the members of the Food Council who have played the leading facilitative role. Still, they have used a privileged status in facilitating the deliberation because they are the central node of this policy network and help connect to external support. Apart from the facilitative role, the mutual recognition of interdependence among stakeholders is a main condition that promotes the attempt to compromise among conflicting parties in a deliberative process. If one decides to walk away from the collaborative effort, it means that they close the door to gain support. The basic issues (e.g. what

kinds of food to grow) can be handled by using a voting method among stakeholders present there. For the tension that was not brought into deliberation, finding a new approach can help (neither A nor B), as seeking agreement does not always work (e.g. from adding or not adding the manure to bringing in the cattle).

7) The role and form of leadership: lead actor, steering group and/or collective leadership

The lead actor in this case is the municipality, as it owns the land and provides the most prominent resource. The continuation or determination of the project largely depended on this local government. The leader who steers the project is the Chiang Mai City Lab, as it monitors the project and manages the pool of resources from other agencies (a boundary spanner/ ecosystemizer). For the organic collective leadership, the role is played by the Chiang Mai Food Council, which is compounded by many active citizens. While the City Lab helps connect national governmental agencies and university faculties, the Food Council connects better with local actors. These three main actors create interdependent relations, as without any of the actors, the project might not be sustained. Although the composting machine owner (a startup), the Office of the National Economic and Social Development Council, and the National Innovation Agency (regional office) contributed very much to making the project possible, they engaged mainly in the early stage by providing resources.

8) The temporal unfolding of the co-creation process: major shifts and ups and downs

With the timeline of the project, the first shift was when two food surveys were presented to the public on 8 January and in the forum on 7 June 2022. This circulation of data confirmed that the food situations in the city of Chiang Mai really needed to be taken into account. This entry point also stimulated key players in the city to agree to attend the public forum on innovative city food policy amid COVID-19 on June 20-21, 2022, which turned out to be the second major shift. This forum resulted in the agreement to establish the Food Council in the city. This did not automatically happen as it required a lot of follow-up meetings. The most important one was organized on 6 December 2022 to draft the structure and clear mandates of the council. This was followed by the establishment of the Food Council at a meeting in the citizen council (the city platform for the endorsement of major co-creative initiatives) on 13 January 2023.

Although the emergence of the Food Council is a critical point, the co-creative project could not be put in place without the agreement of the municipality to use the vacant land and the startup to give the city an opportunity to use its composting machine. Thus, the third major shift was the agreement signing (Memorandum of Understanding: MOU) on land allocation between the City Lab, Municipality, Food Council, and the startup on 9 January 2023. The fourth shift was then when the City Lab (as a facilitator of the initiative) met with the Office of the National Economic and Social Development Council and ended up with a resource provision on 8 February 2023. This helped unlock many project constraints as the City Lab and municipal resources were insufficient to operate the holistic development as planned. After that, the Food Council planning forum on 3 April 2023 can be seen as the fifth shift as it came up with a clear strategy to make changes together in this piece of land.

The ups and downs of the project have undoubtedly happened after the post-COVID-19. On the downside, the idea of a food bank seemed less critical as food shortage became history. Disadvantaged groups can benefit directly from the project anyway, as the area is open for anyone to come and take some food back.

They can also ask for daily employment from the project to do farming activities. Also, the financial support from the first start decreased as most donors thought about the support as seed funding. The upside, however, was the more explicit focus on this practice as a source of healthy and sustainable food and a learning space. Many public agencies wanted to engage, especially after the case was presented at the Provincial Public Health Office on 24 October 2023, which more than ten vital public agencies working on food and health attended. One of them, known as the Thailand Health Promotion Foundation, took a clear step by providing additional resources to support the operation of the Food Council starting from the beginning of November 2023. The clear objective of this grant is to stimulate the development of a role model for others to learn from, both the processes and outcomes. Thus, the major shift from here is the transformation from a way of providing enough food for the community to a means to provide and learn about healthy and sustainable food production and distribution.

9) The most important governance factors (may include factors other than those in focus in this project)

The most important governance factors for this case include (1) the construction of narratives about successful multi-actor collaboration, (2) inclusion and empowerment of relevant and affected actors, (3) the use of experimental tools for innovation (led by City Lab with the support from the National Innovation Agency and a startup), and (4) the exercise of facilitative leadership (Food Council and City Lab). They are important because the project is operated under the policy network. It was designed from the beginning to depend on multi-actor collaboration. Most changes were co-created from the bottom up and led by community members, volunteers and disadvantaged groups. Thus, empowered participation and inclusive development helped push ideas into action. Besides, all interventions were facilitated with the license to fail rather than commanded with static success indicators.

10) The generated outputs and outcomes

The project is still active. The municipality can reduce costs for managing waste by roughly 8,000 USD a year. The organic fertilizer from the composting process can be produced about 500 kilograms every day. 5-10 persons struggling with homelessness and migrants can generate income from daily work depending on their availability (350 Baht each per day). More than ten partners have still played a collaborative role in this project by sharing resources either in kind or in cash. The food bank has been organized/ free food has been allocated based on 30% of the products. In comparison, 70% of these safer products (than those in general markets) have been sold in the local market, aiming to contribute to the development of a fresh, fair, and friendly local food system. Such economic and social sustainability also contributes to environmental sustainability. A clear green transition is a more sustainable waste management. One hundred eighty tons of waste can be managed annually in a green and circular way through this project. Some of those wastes are dry leaves, which are usually handled by burning. Thus, with the provision of an alternative, the project helps reduce air pollution caused by such burning. At the same time, it reduces energy consumption and carbon footprint from transporting waste to be managed in the landfill (70 kilometres away from the city). Although this project cannot stop all transportation, as the city produces 30 tons of waste daily, it can reduce one round that covers 140 kilometres. This means reducing carbon emissions by around 5,500 kilograms of CO_2 each year. Besides, edible green space has been developed from vacant grey areas covering 70 acres. So far, 2,000 movable pots of vegetables have been allocated to each household, which could also increase green spaces in housing zones. A green market was also

established at the site, which helps reduce food miles by roughly 15 kilometres daily for approximately 200 customers (shortening the distance from travelling to the central market).

11) Lessons learned about the conditions for co-creating green solutions

A clear lesson from this case is that social, economic, and environmental sustainability need to come together. Most public agencies still mainly raise questions about the apparent success of the practice, especially in terms of social and economic numbers. The donors also came with indicators and measurements of the return on investment in monetary terms. Thus, the project needs to achieve those social and economic goals to be able to receive continued support. But, at the same time, to engage civil society organizations and active citizens, the project needs to be sensitive to environmental sustainability. For example, a voluntary group, namely 'Green Ranger', took a very active role in doing organic farming on the site and training others. They would walk away if it is not environmentally friendly agricultural practices. Chemical fertilizers and pesticides were thus not used at all to prevent both negative health impacts and the impact on the ecosystem. Most members of the Food Council also vigorously promote the environmental focus of the project, especially by reducing the burning of dry leaves, which cause air pollution (smog/ haze/ PM2.5). It is a fact that Chiang Mai is in the top ten for worst air quality in the world during the summer.

However, it should be noted here that economic and social sustainability is traded off over environmental sustainability in this case. Although most actors agreed on protecting the ecosystem and reducing air pollution, they focused more on how the project would help disadvantaged groups in the face of high inequality, especially during crises. They prioritized the volume and value of food, the number of employment, and the reduction of living costs. Only the City Lab, some members of the Food Council, and the Green Ranger group paid attention to carbon emissions and the importance of the circular approach. Thus, environmental sustainability became a point of consideration mainly because economic and social sustainability could not be achieved without environmental concerns.

Now, the site has become a new destination for visitors. It could help inspire many people - locally, nationally, and internationally. The environmental contribution of the project has been pointed out by many of those visitors. They said they enjoy this open green space as it is home to a variety of species, such as birds and butterflies. This could help stimulate co-learning and co-evolution of all stakeholders for them to be more considerate in this aspect. Recently, the municipality started calling it "eco-tourism", and the City Lab started promoting the narrative of 'micro-climate' as one of the contributions of the site to the city. It is also well-known as the Green-Circular-Economy model, which is still active with a series of ongoing experimentations that allow the spiral pattern of development to happen. In the near future, there will be both the vegetable garden and the animal farm.

Scoring and analysis of governance factors

1. Perceived importance of biosphere conditions

QCA score:	Scoring confidence:	Data sources:
☐ 0	☐ Low confidence	☒ Interviews
☐ 0.33	☐ Medium confidence	☐ Documents
☐ 0.66	☒ High confidence	☒ Observations
☒ 1		

Please elaborate on the reasoning behind your scoring for this governance factor:

The environment (waste management, environmentally friendly food production, and air pollution reduction) played a significant and continuous role in the project, especially in the eyes of the municipality, the Food Council, and the City Lab. The bio-circular-green economy approach was used as the guiding principle in the first place. With that, the project was supported by the relevant public agencies, including the National Innovation Agency and the Office of the National Economic and Social Development Council. Although the green agenda was not the motivational force for most stakeholders, who focus mainly on local food availability and food safety (more than environmental improvement), it is still important to involve the key actors.

2. Legislation, programs, and formal goals

QCA score:	Scoring confidence:	Data sources:
☐ 0	☐ Low confidence	☒ Interviews
☐ 0.33	☐ Medium confidence	☒ Documents
☒ 0.66	☒ High confidence	☒ Observations
☐ 1		

Please elaborate on the reasoning behind your scoring for this governance factor:

The principle of the bio-circular-green economy (BCG Economy) is integrated into the formal programs of the National Innovation Agency and the Office of the National Economic and Social Development Council. Although this principle still advocates mainly for social and economic sustainability, it gives credit to green and circular methods. These programs help support the project as these two national public agencies provided seed funding to this project because it fits their core program. However, such support is not a long-term commitment to resource allocation, and the project's operation is not solely dependent on this resource. Thus, the plans do matter for the project but are not a necessary condition.

3. Relative openness of public governance paradigms

QCA score:	Scoring confidence:	Data sources:
☐ 0	☐ Low confidence	☒ Interviews
☒ 0.33	☒ Medium confidence	☒ Documents
☐ 0.66	☐ High confidence	☒ Observations
☐ 1		

Please elaborate on the reasoning behind your scoring for this governance factor:

The principle of Public Private Partnerships and the concept of network are emphasized by the national and local governments. These fucuses are a way to legitimize the centralized system as the demand for collaboration can also make things possible (without decentralization of power and resources). The project is hosted by the local government, co-funded by central governmental bodies, co-produced by societal actors, and facilitated by local university institutions. However, it should be noted that this collaborative perspective is based highly on unequal power and resources. The project's collaborative problem-solving processes have depended on vertical negotiation, not less than horizontal deliberation. All in all, the state is very bureaucratic. With that, the general approach to communicating and collaborating with societal actors is weak at the national level but stronger at the local level. Thus, this project was framed by a collaborative local governance paradigm (at least by the City Lab) but still needed to operate within the conventional national government structure.

4. Formalized institutional channels for citizen participation and community mobilization

QCA score:	Scoring confidence:	Data sources:
☐ 0	☐ Low confidence	☒ Interviews
☐ 0.33	☒ Medium confidence	☒ Documents
☒ 0.66	☐ High confidence	☒ Observations
☐ 1		

Please elaborate on the reasoning behind your scoring for this governance factor:

Although formal channels for citizen participation in Thailand’s political system are relatively weak, people still have the right to vote in national and local elections, attend public hearings, and be members of local citizen committees. Because local politicians wanted to be re-elected, the mayor and his team promoted this project as it could engage many voters. The project was also endorsed by stakeholders in the public forum supported by the government agency (the Office of the National Economic and Social Development Council). The Food Council could be established due to the legal framework that allows the registration of associations, foundations, and citizens’ councils. This council, then, becomes the backbone of the implementation of the project. Thus, these formal channels directly promoted the project. The limitation is that such formal channels only promoted the formulation of the project at the very beginning. After that, the collaborative process of the project relied rather on the channels within the project itself, especially platforms provided by the Food Council and the City Lab. They help connect the dots, reach out for support, and mobilize resources.

5. Mechanism for ensuring top-down government and bottom-up social accountability

QCA score:	Scoring confidence:	Data sources:
☐ 0	☐ Low confidence	☒ Interviews
☐ 0.33	☒ Medium confidence	☐ Documents
☒ 0.66	☐ High confidence	☒ Observations
☐ 1		

Please elaborate on the reasoning behind your scoring for this governance factor:

The MOU among the municipality, city lab, food council, and startup sets a clear responsibility and accountability for each key player in operating and monitoring the progression and results of the project. This MOU also makes the project accountable to the outside actors as terms of reference. For the top-down, the MOU was used to refer when asking for support from national government agencies. They can consider the promised activities and expected outcomes from the MOU. Regarding the bottom-up, general citizens and other local stakeholders can observe and monitor the project anytime because the site was designed as an open space. The Friday evening's weekly meeting also welcomes anyone (walk-in participants). With MOU, an open space design and inclusive weekly meetings, both top-down and bottom-up accountability can be identified. However, these mechanisms connected to the project's collaborative problem-solving processes when they were used as internal mechanisms rather than external ones. In particular, the MOU creates a high degree of commitment to making change happen. Monitoring led to much feedback for them to improve their collaborative efforts, such as the quality of soil, the amount of the products, and the distributive model. Besides, this project is embedded in the municipal workflow, especially waste management and community engagement. Thus, these mechanisms help ensure that the project is in the eyes of the public but not for enhancing collaboration with most outside actors.

6. Strategic agenda-setting by means of translation

QCA score:	Scoring confidence:	Data sources:
☐ 0	☐ Low confidence	☒ Interviews
☐ 0.33	☒ Medium confidence	☐ Documents
☒ 0.66	☐ High confidence	☒ Observations
☐ 1		

Please elaborate on the reasoning behind your scoring for this governance factor:

The local agenda for the project is shaped mainly by SDG 12 (Responsible Consumption and Production). The City Lab, as one of the initiators and key actors, refers to this SDG 12 as an important motivation for carrying out the project. This goal was translated to fit the lifeworld of the local people here with a specific focus on the notion of "care" for producers and customers, which makes the different stakeholders find its importance to their lives. This notion redefines responsible consumption and production by highlighting care for each other. In addition, the municipality also refers to SDG 11 (Sustainable Cities and Communities). The focus is on city waste management and well-being. However, in this case, the reference to SDGs seems to be mainly a tactic to reach out for support. At the practical level, local actors have been

attracted and motivated to participate in the project by the factual situations about the unavailability of trustworthy healthy food sources rather than these global goals (based on facing situations). In other words, these goals are present in a significant way, but the project did not rely on them.

7. Construction of narratives about successful multi-actor collaboration

QCA score:	Scoring confidence:	Data sources:
☐ 0	☐ Low confidence	☒ Interviews
☐ 0.33	☒ Medium confidence	☐ Documents
☐ 0.66	☐ High confidence	☒ Observations
☒ 1		

Please elaborate on the reasoning behind your scoring for this governance factor:

Previous collaboration experiences made many stakeholders believe in the importance of collaboration, especially the non-state actors and that stimulated them to keep doing it. For example, the secretariat of the Food Council, who has rich experiences working with public and non-public organizations, said that from her experiences, the success of the movements initiated by laypeople depends on how to work with others, not how to win the fight. Key public agencies have also learned from past experiences to compromise with non-public sectors in order to work with them. The mayor mentioned that his authorities are always limited to making significant changes. Thus, he needs to work with other sectors to make such change possible. In this project, all stakeholders seem to agree in the first place (based on their experience) that collaboration is required to transform the piece of land into an inclusive urban farm and a green market. That perception, then, helps stimulate them to work together.

8. Building or harnessing institutional platforms and arenas

QCA score:	Scoring confidence:	Data sources:
☐ 0	☐ Low confidence	☒ Interviews
☐ 0.33	☒ Medium confidence	☐ Documents
☐ 0.66	☐ High confidence	☒ Observations
☒ 1		

Please elaborate on the reasoning behind your scoring for this governance factor:

The use of digital platforms and physical arenas has the capacity to enable or support the problem-solving processes. Collaboration, in this case, relies very much on forums, meetings, and online group chats facilitated by the City Lab and the Food Council. Such platforms and arenas help connect different actors and boost their collaboration. For example, the public forum organized by the City Lab made it possible for multi-stakeholders to express their interest in co-creating this project after the mayor offered to use the piece of municipal land for growing food. This platform was an entry point that later led to the agreement signing (MOU). Food Council meetings were used to deliberate important collaborative directions and handle value conflicts. Also, Friday evening's weekly meetings at the site led to an

agreement on what kinds of food to grow and built a commitment among community leaders and active citizens to implement the plan.

9. Provision of access to blended financing

QCA score:	Scoring confidence:	Data sources:
☐ 0	☐ Low confidence	☒ Interviews
☐ 0.33	☒ Medium confidence	☐ Documents
☐ 0.66	☐ High confidence	☒ Observations
☒ 1		

Please elaborate on the reasoning behind your scoring for this governance factor:

The financial support for the project came from three central governmental bodies, one local government, one local university, and one private sector. Each of them requires specific achievement at different angles of the project. For example, the National Innovation Agency requires the promotion of innovative solutions. The Office of the National Economic and Social Development Council demands concrete local economic and social impacts from the project. The Health Promotion Foundation (just involved recently) looks for the health promotion dimension of this work. To achieve all these, the project creates an interdependent condition for all actors. They need to collaborate to make it possible to achieve all these goals. Thus, blended financing was a precondition of realizing the project. It affected co-creation by providing incentives for active actors. The City Lab and the Food Council coordinators have gained their salary from these funding sources. With that, they need to be active in connecting with others, preparing for meetings, and running relevant activities. All participants that attend the meetings are paid for their time. Labourers (mostly disadvantaged) also receive the minimum wage (seven positions). Free food and beverages are provided as well. Only five municipal staff who help operate the composting machine and do general farming activities (e.g. watering) work without additional compensation, as the mayor assigns these tasks to be their routine work.

10. The capacity to leverage support from authorities to enable local collaboration

QCA score:	Scoring confidence:	Data sources:
☐ 0	☐ Low confidence	☒ Interviews
☐ 0.33	☒ Medium confidence	☐ Documents
☐ 0.66	☐ High confidence	☐ Observations
☒ 1		

Please elaborate on the reasoning behind your scoring for this governance factor:

The connection between the City Lab and the high-level authorities is relatively special compared to other normal local projects due to the status of the School of Public Policy (the host of the City Lab) as a consultant for many top international organizations and national public agencies. With this, the lab connected with UNDP, the Office of the National Economic and Social Development Council, the National Innovation Agency, and the Health Promotion Foundation and successfully mobilised financial support

from them. Thus, these higher-level authorities helped the project overcome challenges by providing seeding funds. With their engagement, the municipality was pleased to collaborate by providing space and five staff members. It also invested in building the accessible road to the site and the infrastructure for installing the composting machine. Besides, this local government was responsible for the electricity and water supply bills. All these mattered for the project's endurability and ongoing contributions to social, economic and environmental sustainability.

11. Inclusion and empowerment of relevant and affected actors

QCA score:	Scoring confidence:	Data sources:
☐ 0	☐ Low confidence	☒ Interviews
☐ 0.33	☒ Medium confidence	☐ Documents
☐ 0.66	☐ High confidence	☒ Observations
☒ 1		

Please elaborate on the reasoning behind your scoring for this governance factor:

The farm developed by the project is known widely as an inclusive urban farm. With this signature, the project succeeded in engaging multi-stakeholders who wanted to contribute to the practice that attempted to leave no one behind. The voices of all actors, especially the potentially marginalized ones, have been actively and meaningfully included in collaborative problem-solving process, rather than being dismissed subsequently. At its first start, the project adopted design thinking tools for disadvantaged people-centric policy design during the two-day public forum organized by the City Lab in June 2022. This forum was made different by inviting homeless persons, ethnic minorities, migrant workers, and unemployed youths to participate. The forum began with the analysis of the pain points of these disadvantaged groups by mapping their journey and understanding their personas. They were empowered by the facilitators in order to speak in public about their hopes and fears. Public authorities in the forum were asked to listen to the needs of those people and think about how to improve their well-being. The initiative of the space of possibilities was actually proposed by a homeless person who actively attended the forum. He still takes a vital role in driving this project at the operational level as a gardener/ farmer. Apart from that, the project also engages some migrants and ethnic minorities. They are the priority of daily employment (seven positions with the minimum wage), although less than five persons from this target group could regularly make it. This unexpected number results from the complex personal life struggles of these people. Some homeless persons, for instance, have anti-social behaviour or mental inconsistency. In addition, the training of inexperienced farmers was provided by the key members of the Food Council with the collaboration of the Faculty of Agricultural Science, Chiang Mai University. This is another way to include broader community members in the project. However, the project has still not succeeded yet in including the associations of commerce and tourism (peak business associations). Persons with disability are also facing difficulties in participating in the project as all facilities are not universally designed.

12. Clarification of interdependence vis-à-vis common problem and joint vision

QCA score:	Scoring confidence:	Data sources:
☐ 0	☐ Low confidence	☒ Interviews
☐ 0.33	☒ Medium confidence	☐ Documents
☐ 0.66	☐ High confidence	☒ Observations
☒ 1		

Please elaborate on the reasoning behind your scoring for this governance factor:

It is clear from this project that the sense of interdependence between project participants has the potential capacity to support or motivate the project participants in the collaborative problem-solving process of the project. The municipality, for example, realized that without the decisive engagement of others, the organic waste cannot be managed like this, and the land cannot be transformed into a healthy food production site. The Food Council also realized that its firm intention to create an alternative food source for the city would not turn out to be real without the support from the City Lab. At the same time, the City Lab would not be able to propose to facilitate the project without funding from the national public agencies. Community leaders, on the other hand, might not feel confident without the active participation of community members and volunteers. As mentioned by the mayor, when this project was planned to start, his first thought was to call for an agreement signing among key actors (National Innovation Agency, City Lab, Food Council, Composting Machine owner (a startup), and municipality) because he could not imagine the success of the project without any of them. One municipal staff also said that he adjusted himself to align better with the volunteers (Green Ranger group). He needed to do that in order to ensure that those volunteers would still come back to help. He made a lot of compromises to sustain the collaboration, such as meeting them after his official working hours (4 pm) due to their availability. On the other hand, one of these volunteers mentioned that he could not work on the farm if the municipal staff could not come to prepare the land by using the machine. Thus, these interdependent relations mobilize actors and stimulate collaboration.

13. Trust-building and conflict mediation

QCA score:	Scoring confidence:	Data sources:
☐ 0	☐ Low confidence	☒ Interviews
☒ 0.33	☒ Medium confidence	☐ Documents
☐ 0.66	☐ High confidence	☒ Observations
☐ 1		

Please elaborate on the reasoning behind your scoring for this governance factor:

The project has at some stage taken steps to build trust or mediate conflict, but it lacks the systematic measures or routines in place to build continuous trust and to mediate dispute. Unequal power relations and social hierarchies still impact collaborative efforts. The Food Council attempts to be a conflict mediator, but the council has less power to mediate tensions between top politicians/ civil servants and community members. The Thai culture also avoids confrontation and argumentation. Thus, conflicts were rarely brought to the table for a serious discussion. They were instead hidden. With that, the actors with

lower power usually must go with it (accept it) to avoid any possible negative impacts. For example, no one confronts the mayor to challenge his plan to grow more flowers. His municipality owns the land, and this local government invests the most in this project.

14. Use of experimental tools for innovation

QCA score:	Scoring confidence:	Data sources:
☐ 0	☐ Low confidence	☒ Interviews
☐ 0.33	☐ Medium confidence	☒ Documents
☐ 0.66	☒ High confidence	☒ Observations
☒ 1		

Please elaborate on the reasoning behind your scoring for this governance factor:

Experimentation is the main approach that guides the operation of this project. The City Lab, as the primary facilitator of the process, introduced this approach and led the project by moving from ideas to innovative prototypes with the support of the National Innovation Agency. For example, the idea of inclusive urban farming was an innovative solution resulting from a deliberative forum that adopted design thinking tools. The composting machine was another innovative solution that was used in this project as a way to test its feasibility. The fertilizer as an output of the machine was also tested scientifically for its quality (NPK). Thus, it is clear that the project solicits inputs from affected actors or builds provisional solutions in the process of designing new solutions. The project also builds and tests provisional solutions (prototypes/mock-up) developed by the project to facilitate feedback from users in the process of designing the project solution. Then, the use of feedback from test and provisional solutions in designing the project solution has contributed positively to the collaborative problem-solving process. For example, the municipality agreed to pay to rent the composting machine to continue using it after the one-year experiment of its efficiency (continue to collaborate with the startup). The Food Council brought up the issues about the quality of fertilizer after the test results came out to discuss as feedback to rethink whether manure was needed or not and how to reduce mixed non-organic wastes that were used as inputs supplied in the machine. The quantity and quality of food products after harvesting for the first time were also taken into discussion based on their low productivity and bad shape. Such issues led to further collaboration to enhance the practice and reach out for additional support to address the existing pain points. This includes the collaboration with the new startup called GEPP, which developed an application that supports more effective waste sorting to improve the quality of fertilizer based on more proper inputs supplied to the machine (sorting only organic waste without mixing with other wastes). Agricultural scientists from the Faculty of Agricultural Science have collaborated more closely as well to gain their support to improve the quantity and quality of food products.

15. Ongoing critical self-reflection and learning (i.e., process and/or developmental evaluation):

QCA score:	Scoring confidence:	Data sources:
☐ 0	☐ Low confidence	☐ Interviews
☐ 0.33	☒ Medium confidence	☐ Documents
☒ 0.66	☐ High confidence	☒ Observations
☐ 1		

Please elaborate on the reasoning behind your scoring for this governance factor:

The formal evaluations were made based on funders' requirements, and those involved mainly the measurable outputs and outcomes, such as the volume of the products, the efficiency of the composting machine, and the quality of soil. The informal reflection from the meetings among local actors seems to help more in stimulating co-learning and co-evolving along the way. However, such reflection was mainly related to the operational level, such as gardening techniques, the outreach of volunteers, and the demands of local markets. So, it might not have helped to advance the collaborative process of the project as a whole. The continuity of this collaborative project still depends very much on funders from the outside. The City Lab has played a significant role at that level, which is not really linked directly to the interactions among local stakeholders. For example, the report to the National Innovation Agency was not reflected to local stakeholders. At the same time, the operational level of feedback was not included in the executive summary report for that government agency as it was out of the scope (focus mainly on outputs and outcomes – not the details of the process). In brief, even though vertical learning between top and bottom exists, it is low and has a limited impact on their collaboration.

16. Exercise of facilitative leadership:

QCA score:	Scoring confidence:	Data sources:
☐ 0	☐ Low confidence	☒ Interviews
☐ 0.33	☒ Medium confidence	☐ Documents
☐ 0.66	☐ High confidence	☒ Observations
☒ 1		

Please elaborate on the reasoning behind your scoring for this governance factor:

While the Municipality is a formal leader in the project, the City Lab and the Food Council can be called facilitative leaders. They truly help facilitate the collaborative processes. With some degree of respect, the municipality has cooperated very well with the two facilitative leaders at the same time that it led community leaders and members to work on the project. They lead meetings and drive the collaborative problem-solving process forward. The efforts made by these project leaders are successful, as they enable collaborative interaction between project participants at different levels. The City Lab helps ensure external support and facilitate the innovative process (based mainly on design thinking for testing innovative prototypes by starting from the pain points of the disadvantaged in the city). The Food Council helps connect key players in the food chains and volunteers while facilitating the operation on the ground. Conversely, the municipality helps secure land, develop infrastructures, and connect communities. Facilitative leadership is a really important factor that carries out the project by making a

difference in two main ways. First, the project was able to engage many actors outside the formal governmental territory of the municipality. Second, with the facilitative role, resources were mobilized across different sectors. For example, two startups who developed the composting machine and waste sorting application contributed to the project regarding the connecting role of the City Lab. The boundary-spanning role of the Food Council also helped bridge active citizens (e.g. Green Ranger group) outside the municipal boundary in order to support the community members.

Outcome variable: Successfully co-created green transitions

The outcome variable 'co-created green transitions' will be scored in two parts. First, 'co-creation' will be scored based on an assessment of whether the participants in the initiative, project or process engaged in collaborative problem-solving that fostered creative ideas and innovative solutions (data will consist of survey data combined with interviews and documents). Next, 'green transitions' will be scored based on an assessment of whether the initiative, project or process has fulfilled or is expected to fulfill its green goals, ambitions and aspirations (data will consist of survey data combined with interviews and internal and/or external evaluation reports, including scientific publications).

The scoring of this variable is done in two parts:

1. *Is the developed solution based on collaborative problem-solving spurring creativity and innovative solutions?*
2. *Does the developed solution engender a green transition?*

This scoring should be conducted based on both the survey and complementary green outcome evaluations. Please consult Sections 4.4 and 6.10 in the Research Protocol for more details.

1. Is the developed solution co-created?

QCA score:	Scoring confidence:	Data sources:
☐ 0	☐ Low confidence	☒ Survey
☐ 0.33	☐ Medium confidence	☒ Interviews
☐ 0.66	☒ High confidence	☒ Documents
☒ 1		☒ Observations

Please elaborate on the reasoning behind your scoring for this part of the governance factor, including the data sources used for the scoring.

From the survey, only 1 out of 30, who might not be involved much in the project, strongly disagreed or slightly disagreed about the co-creative efforts of this project, while the majority (40% up) agreed or strongly agreed. Almost all means are also higher than 1.5, except the point that the co-created solution breaks with established practices (1.4). This point results from the domination of the market-oriented chemical farming practices shaped by the large food corporations that cannot be replaced easily.

In detail, multi-stakeholders collaborated in designing and implementing the project. A range of actors played an active role in forming the project with others. This project formulation started from the agreement of participants in the public forum in mid-2022. This forum was designed by the City Lab in

collaboration with the Office of the National Economic and Social Development Council in order to develop innovative solutions based on inclusive participation and collaborative creativity. The mayor offered the piece of land. The startup proposed using its organic waste composting machine. Food-related civil society organizations (formed later as the Food Council) agreed to facilitate the project's collaborative efforts. The survey results confirm that the majority (43.33%) strongly agree that the problem-solving mobilized different experiences, and/or ideas and/or forms of knowledge to develop new perspectives. 50% agree that through the collaborative problem-solving process, different experiences and/or ideas and/or forms of knowledge have been mobilized to search for unconventional solutions. The same percentage agrees that the co-created solution offers new ideas to address the green transition problem, while 56.67% strongly agree with supporting the co-created solution. Also, 60% strongly agree that the multi-actor collaboration process was a prerequisite for the project's success.

Those key participants later also engaged in the implementation of the project. In this implementation stage, the City Lab took a leading role in mobilising resources to operate the project. It achieved in doing so as the National Innovation Agency agreed to support. Later, the Health Promotion Foundation also provided a grant in order to develop the practice to be a role model for other places to learn from. The whole operation indeed depended on the co-production of community members, disadvantaged groups, and general active citizens (volunteers). The site is open to all, with the core principles of inclusivity and empowerment. As shown in the survey results, 60% agree that the collaborative interaction in the project has led to an innovative solution. 53.33% agree that the co-created solution will be durable and robust in the long run. The same percentage strongly agrees that the co-created solution is expected to significantly improve sustainability for the whole community.

If possible, please insert your survey responses in the table below (in % for each response), including the mean/average % for each survey item.

	Strong. dis.	Dis.	Slight. dis.	Neither agr/dis	Slight. agree	Agree	Strong. agree	Mean
1. Problem-solving mobilized different experiences, and/or ideas and/or forms of knowledge to develop new perspectives	0	0	0	1 (3.33)	4 (13.33)	12 (40.00)	13 (43.33)	2.233
2. Through the collaborative problem-solving process, different experiences and/or ideas and/or forms of knowledge have been mobilized to search for unconventional solutions	1 (3. 33)	0	0	2 (6.67)	5 (16.67)	15 (50.00)	7 (23.33)	1.767
3. The collaborative problem-solving process mobilized different experiences, and/or ideas and/or forms of knowledge to search for solutions that go beyond standard/text-book solutions	0	0	1 (3.33)	2 (6.67)	5 (16.67)	15 (50.00)	7 (23.33)	1.833

4. The co-created solution breaks with established practices	0	0	1 (3.33)	4 (13.33)	10 (33.33)	12 (40.00)	3 (10.00)	1.400
5. The co-created solution disrupts conventional wisdom	0	0	0	3 (10.00)	9 (30.00)	15 (50.00)	3 (10.00)	1.600
6. The co-created solution offers new ideas to address the green transition problem	0	0	0	2 (6.67)	5 (16.67)	15 (50.00)	8 (26.67)	1.967
7. I'm supportive of the co-created solution	0	0	0	0	1 (3.33)	12 (40.00)	17 (56.67)	2.533
8. I'm content with the overall collaborative process of the project	0	0	0	1 (3.33)	4 (13.33)	15 (50.00)	10 (33.33)	2.133
9. I feel the multi-actor collaboration process was a prerequisite for the success of the project	0	0	0	1 (3.33)	2 (6.67)	9 (30.00)	18 (60.00)	2.467
10. I'm satisfied by the results of the co-creation effort in terms of expected impact on the welfare of the community	0	0	1 (3.33)	2 (6.67)	9 (30.00)	13 (43.33)	5 (16.67)	1.633
11. The collaborative interaction in the project has led to an innovative solution	0	0	0	4 (13.33)	4 (13.33)	18 (60.00)	4 (13.33)	1.733
12. The actors involved in the project are engaged in collaborative interaction that stimulated creative problem-solving	0	0	0	1 (3.33)	7 (23.33)	12 (40.00)	10 (33.33)	2.033
13. The co-created solution meets the proposed goals of the project	0	0	2 (6.67)	2 (6.67)	7 (23.33)	15 (50.00)	4 (13.33)	1.567
14. The co-created solution will be durable and robust in the long run	0	0	1 (3.33)	3 (10.00)	1 (3.33)	16 (53.33)	9 (30.00)	1.967
15. The co-created solution is expected to significantly improve sustainability for the whole community	0	0	0	1 (3.33)	2 (6.67)	11 (36.67)	16 (53.33)	2.400

2. Does the developed solution engender a green transition[1]?

QCA score:	Scoring confidence:	Data sources:
☐ 0	☐ Low confidence	☒ Survey
☐ 0.33	☐ Medium confidence	☒ Interviews
☒ 0.66	☒ High confidence	☒ Documents
☐ 1		☒ Observations

Please elaborate on the reasoning behind your scoring for this part of the governance factor, including the data sources used for the scoring:

This project satisfied all the funders, especially with its contributions to the development of an alternative food source and the cost reduction of organic waste management. It also proved the efficiency of the composting machine and created a lot of fertilized soil that is proper for gardening. For the direct contributions to environmental sustainability, the project helped reduce food waste. It provided a more sustainable method of managing waste (the circular approach), around 180 tons per year. It reduced burning dry leaves that caused air pollution/ smog/ haze/ PM2.5. Energy consumption of 140 kilometres daily and carbon emissions of around 5,500 kilograms of CO2 annually were also reduced by the decreased rounds of transportation of waste to the landfill. The transformation of vacant grey areas into the edible green space of 70 acres should be counted here as well. Such micro-climate was spread out to housing areas as pots of vegetables were allocated to many households. Besides, a green market helped reduce food miles as roughly 200 local people there could avoid travelling to the 15 kilometres-distant central market.

However, the volume of the products is still insufficient to feed all city dwellers. The promise to enhance the well-being of disadvantaged groups is still not accomplished, as only a few homeless people, migrants, and ethnic groups have been engaged so far. Responsible production and consumption also require more public communication in order to advocate the paradigm. At present, few people in the city know about the project and its goals. With the survey, the largest percentage (96.7%) is to see the project is expected to produce/ has produced a green transition solution aiming to avoid a worsening in the status quo. It is so true as large food corporations are still active and dominate the food systems out there. They own a lot of convenience stores and modern trade systems. At the same time, laypeople come back from the nightmare during COVID-19 and enjoy consuming the abundance of unhealthy food in the country that positions itself as the world kitchen.

[1] By ”green transitions”, we mean objectives and aspirations that correspond to at least one of the Green SDGs (SDG 6, 7, 11, 12, 13, 14, 15). The project does not have to refer explicitly to the green SDGs, but the project’s green objectives

If possible, please insert your survey responses in the table below (in % for each response).

1. The project:	Yes	No	Don't know
…did not produce any green transition solution	6 (20)	24 (80)	
…is expected to produce/has produced a green transition solution aiming to avoid a worsening in the status quo	29 (96.7)	1 (3.33)	
…is expected to produce/has produced a green transition solution aiming to maintain the status quo	21 (70)	9 (30)	
…is expected to produce/has produced a green transition solution aiming to improve the status quo	15 (50)	15 (50)	

Note: The first one was translated in Thai that "no" means the statement that "the project did not produce any green transition solution" is not true. Thus, it can interpreted that 80% agreed that the project produced a green transition.

Please list all the informants you have interviewed for the case study (list project role + interview date):

a) Senior Innovation counsellor, National Innovation Agency
b) Plan and Policy Analyst, Office of the National Economic and Social Development Council
c) Project Coordinator, Chiang Mai City Lab, School of Public Policy
d) Project Coordinator, Chiang Mai City Lab, School of Public Policy
e) Division Director, Division of Social Welfare, Suthep Municipality
f) Community Development Officer, Division of Social Welfare, Suthep Municipality
g) Secretariat of Chiang Mai Food Council
h) Secretariat of Chiang Mai Food Council
i) Secretariat of Chiang Mai Food Council
j) Representative, V renewable Co., Ltd (composting machine owner)
k) Co-founder, G.E.P.P. SA-ARD Co., Ltd
l) Agriculturist, Center for Agricultural Resource Systems Research, Faculty of Agricultural Science, Chiang Mai University
m) Asst. Prof. Dr., Faculty of Agricultural Science, Chiang Mai University
n) Community leader
o) Community leader
p) Community member
q) Gardener (ethnic minority)
r) Gardener (Suthep Green Market)
s) Volunteer (Green Ranger)
t) Volunteer (Nature and Environmental Conservation Volunteer)

Please list all the observations you have made (type of meeting/workshop/etc. + observation date):

The survey of food situations in the city of Chiang Mai twice (from 4 to 8 January 2022 and from 1 to 7 June 2022.

Public forum on innovative city food policy amid COVID-19 on June 20-21, 2022.

Meeting to prepare for the establishment of the Food Council on 6 December 2022.

MOU on land allocation between the City Lab, Municipality, Food Council, and the startup on 9 January 2023.
The establishment of the Food Council in the citizens' council meeting on 13 January 2023.

Meeting with the Office of the National Economic and Social Development Council to mobilize resources on 8 February 2023.

Food Council planning forum on 3 April 2023.

Food Council meeting on 7 August 2023.

Meeting with public agencies at the Provincial Public Health Office on 24 October 2023.

The workshop with the Thailand Health Promotion Foundation for further development of the Food Council on 1 November 2023.

Informal meetings at the site (every Friday evening).

Please list all the documents you have analyzed (document name + source + year):

Office of the Prime Minister. 2018. National Strategy 2018-2037. Bangkok: National Economic and Social Development Council.

School of Public Policy, CMU. 2022. Final Report of Chiang Mai City Lab. Bangkok: National Innovation Agency.

School of Public Policy, CMU. 2022. Thailand Innovative Policy Analysis and Design Framework and Cases. Bangkok: Thailand Policy Lab.

School of Public Policy, CMU. 2023. Final Report of Social Lab. Bangkok: National Economic and Social Development Council.

School of Public Policy, CMU. 2023. The Practice and Lessons of Food Policy Council in Chiang Mai. Nonthaburi: Health Promotion Foundation.

Suthep Municipality. 2023. Municipal Law on Food Security. Chiang Mai: Suthep Municipality.

Please note the response rate for the survey/measurement of outcome variable:

100%