Context of organic vegetable production in Sam Sung district, Northeast Thailand

Md. Shahidul Islam[1*], Theerachai Haitook[2] and Suchint Simaraks[3]

ABSTRACT: The importance of organic agriculture is being realized by the farmers as well as the policy makers, intellectuals and sensitive citizens after observing the adverse effects of using synthetic chemicals and pesticides indiscriminately. Like many countries of the world, the Government of Thailand is also trying to promote organic farming. Farmers in Sam Sung district, Khon Kaen province, Northeastern Thailand have been growing organic vegetables successfully since 2008, and the number of organic vegetable growers has increased sharply. The study was conducted from March to September 2012 with the aim to understand the general context of organic vegetable growing in the abovementioned area. The techniques of informal interviews with key informants, face-to-face interviews of farmers with a pretested questionnaire, and observations were done to collect both secondary and primary data. Land and very shallow underground water are the main natural resources in the area. The government has allocated public land, developed a good irrigation system, and provided training for organic vegetable growers. Most of the organic vegetable growers are women and aged people. The Central Marketing Group, Thailand has also helped them to establish a cooperative for organic vegetable processing and marketing, and it is now running by itself. Along with the natural resources, the establishment of farmers' organizations, the strengthening their capacity building by providing knowledge and infrastructure development, and the establishment of backward and forward linkages have created a favorable environment for running the organic vegetable production system in Sam Sung district. It has created a scope to use the opportunity labor of the village farmers to earn extra income as well as satisfy households' vegetable needs.

Keywords: context, organic vegetable production, Sam Sung district

Introduction

Organic agriculture is a holistic production management system which promotes and enhances agro-ecosystem health, including biodiversity, biological cycles and soil biological activity; avoiding the use of synthetic fertilizers and pesticides (FAO and WHO, 2007). "Organic" is a claim on the production process rather than a claim on the product itself (Gold, 2007). Organic agriculture tends to exclude the use of synthetically compounded fertilizers, pesticides, growth regulators, livestock feed and additives, and genetically modified organisms; it is based on four principles: health, ecology, fairness and care (IFOAM, 2005). Organic farming is considered by some to offer solutions to the problems associated with conventional agriculture (Scialabba, 2000; Wheeler, 2008) such as biodiversity loss, nitrate pollution, animal welfare concerns, surplus production or food safety (Lynggaard, 2006; Rigby et al., 2001), provision of public goods linked to rural development (Koesling, 2008).

There is no strong evidence in favor of the common people's belief that organic product is more nutritious and healthier than their conventional counterparts. Only phosphorus was found significantly higher in organic products

[1] Bangladesh Agricultural Research Institute (BARI), Patuakhali, Bangladesh 8600

[2] Dept. of Animal science, Faculty of Agriculture, Khon Kaen University, Thailand 40002

[3] System Approaches in Agriculture Program, Faculty of Agriculture, Khon Kaen University, Thailand-40002

* Corresponding author: shahid75bari@yahoo.com

compared to their conventional counterparts (Spangler et al., 2012). But people prefer organic products because they have less hazardous elements residue content as compared to their conventional counterparts and they are more environmentally friendly (Spangler et al., 2012). Demand of organic or safe agricultural products are increasing day by day, both domestically and internationally, due to the increased awareness of the danger of chemical inputs and food safety as well as believing that organic products are healthier and more environmentally friendly (Schobesberger et al., 2008).

Global sales of organic food & drink reached 59 billion US$ in 2010, while it was only 15.2 billion US$ in 1999, indicates an expansion of four-fold in 11 years (Willer and Kilcher, 2012). Growth rate of Thai organic agricultural market is much higher than that of world market. In 2002 it was only 9.4 million US$ (Lorlowhakan et al., 2008) that rose to 135.44 million US$ in 2009; half of which was exported, while the rest half was locally consumed (TOTA, 2011). The emerging growth figures indicate a voracious appetite for development of organic agriculture especially organic vegetable. Organic products could be sold at much higher prices than the conventional products as these are good for consumers' health (Kilcher, 2006; Lockie et al., 2006), thereby providing farmers better income (Rigby and Caceres, 2001; Rasul and Thapa, 2004; Chung et al., 2012). Thai farmers are also interested in alternative vegetable farming such as safe use farming, natural farming, chemical pesticide free farming and organic farming, and they strongly believe that alternative farming can provide economic feasibility due to the high prices of their products, while reducing the burden on the environment (Kawasaki and Fujimoto, 2009). Among the numerous agricultural farming products vegetable is too much important concerned to food safety, as many of vegetable are consumed fresh as *salad*. Farmers also use a lot of synthetic pesticides in vegetable rather than cereal crops; many dangerous pesticides even just before or few days of harvesting. This is very harmful for the human health. Thai Government also adopted a policy to increase organic agriculture in a cabinet resolution on January 4, 2005 (Lorlowhakan et al., 2008). The convergence of these trends contributed to the pace of development of organic agriculture in Thailand during the early 1990s, and to its more rapid take-off from 2001 to the present day (Ellis et al., 2006); from 1004 ha in 1998 to 34079 ha in 2011 (Green Net, 2011). In Northeast Thailand, it was developed in small scale business oriented mainly organic rice based, and then extended to vegetable (Pornpratansombat et al., 2011).

Most of the commercial organic vegetable growers in Thailand are large companies or commercial individuals or commercial contact growers. But in Northeast the organic vegetable growers are mostly small holding farmers. In many areas of Northeast Thailand farmers started to grow organic vegetable in recent years and many of them failed to stay stand. But in Sam Sung district under Khon Kaen province farmers have been growing organic vegetable since 2008 and the number of growers increased sharply. They are growing organic vegetable successfully. Therefore, the aim of the study was to understand the general context of growing organic vegetable in Sam Sung district.

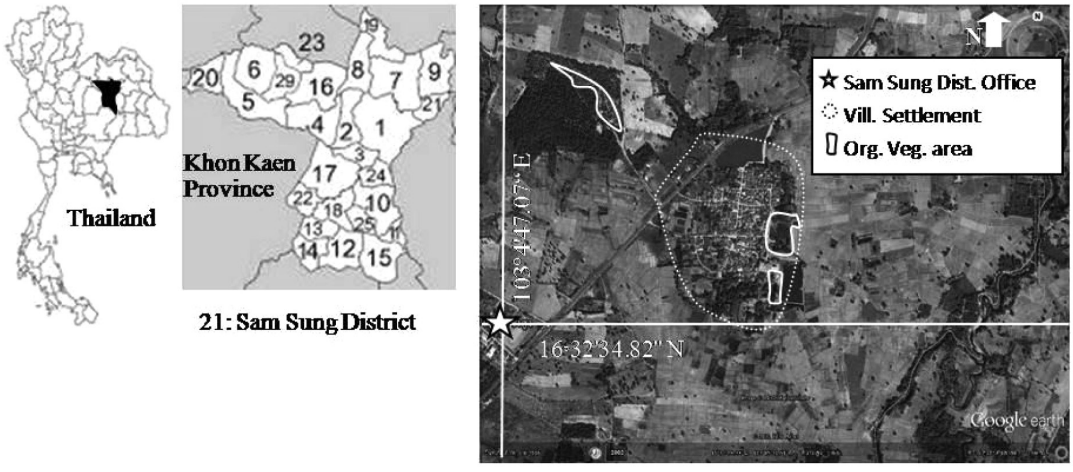

Figure 1 Location of the study area

Materials and Methods

The study was conducted at Ban Sawang and Ban Samhong villages under Huai Toei sub-district (*Tambon*), Sam Sung district (*Amphoe*), Khon Kaen province, Northeast Thailand (Figure 1). The area is about 35 kilometer east of the Khon Kaen provincial headquarter. The organic vegetable growing area is situated from 16°32'28.75"N to 16°33'22.86" N latitude and 103° 4'32.56" E to 103° 5'40.39" E longitude in the world map. Data were collected from District Administrative office, District Agriculture Extension office, sub-District Administrative office, village headmen of the selected villages, manager of the cooperative, organic fertilizer producing group, organic vegetable growing farmers and non growers in the study area. As the population of organic vegetable growers (115) in the study area was not too high the authors tried to interview to all, but due to unavailability of some farmers and time constraint the authors were able to interview 85 organic vegetable growers (74 per cent of the population). The two villages situated in the same residential area and the organic vegetable growers were randomly scattered in both of the villages. Therefore, Sawang village was selected as a representative for non grower sampling. Out of 117 households in Sawang village (Huai Toei, 2011), 62 were organic vegetable growers and 55 were non-growers. The researchers tried to interview all of the 55 non-grower households. But due to similar constraints like organic vegetable growers household interviewing they were able to interview 40 households (73 percent of the population). The techniques of informal interview with a preplanned sub-topics list was applied get information from the above mentioned key informants except household's interview. Household's interviews of organic vegetable growing farmers and non growers were done with a pretested questionnaire. Both secondary and primary data were collected on physiographic, natural resources and infrastructure, population, overall agricultural practices of the area, history and present status of organic vegetable and

cooperative for marketing of organic vegetable. Secondary data were collected from Sam Sung district and Huai Toei sub-district offices. Triangulation technique was applied to verify the collected data. Mainly qualitative data analysis was done except few quantitative data analysis, like mean and per cent. Contexts of natural resources, socio-economic and institution related to organic vegetable production in Sam Sung district were tried to understand.

Results and Discussion

Administrative organization of Sam Sung district

Sam Sung, the minor district (*King Amphoe*) was established on March 31, 1994 by splitting five sub-district from Kranuan district. The establishment of the new district became effective on April 30, the same year. Following a decision of the Thai government on May 15, 2007, along with the 81 minor districts Sam Sung was to be upgraded to full districts. With the publishing in the Royal Gazette (2007) on August 24 the upgrade became official. Sam Sung district is under Khon Kaen province in Northeast Thailand, surrounded by Mueang Khon Kaen, Nam Phong and Kranuan of Khon Kaen province, and Chuen Chom and Chiang Yuen of Mahasarakham province. The district is divided into five sub-districts (*tambon*), which are further subdivided into 34 villages (*muban*). The township (*thesaban tambon*) Sam Sung covers the complete *tambon* Kranuan. There are another four *tambon* administrative organizations (TAO), namely Kham Maet, Ban Non, Khu Kham and Huai Toei. Total area of the district is 117 Km^2. The targeted study area is under the sub-district of Huai Toei; having an area of 24604 *rai* (6.25 *rai* = 1 ha). The sub-district consists of seven villages, namely Sok Kha Kaew, Huai Toei, Lup Lao, Nong Kham, Sawang, Samhong and Huai Fai.

Natural resources and infrastructure in the study area

Land is the main natural resource in the study area. Soil is mostly sandy with very low organic matter content. Elevation of the villages from sea level is 170 to 220 meter having a slope from north-west to south-east. A small stream, namely *Huai Sai Bath* is flowing from north to south along the eastern border of the villages. Underground water is very shallow and can be lifted easily by tube well. There are two quite big ponds lie in the villages. Farmers have ponds in their farm to do agricultural activities as well as they serve as a source of different types of fishes and aquatic vegetable. A well constructed two-lane asphalt road runs from south-west to north-east through the study area. Village settlement is mostly on the right side of the road. Every house of the villages has good road communication access. The villages also have reinforced concrete cement and latterite roads to go to their farm fields both upper and lower areas. They have two big temples and a school for the community. There are one vegetable processing center and one organic fertilizer producing factory. The villages have good water supply system used underground water. They use the water for both domestic purposes and to irrigate the vegetable plots. There is no electricity problem in the area. Every house has electricity connection. They have easy access to mobile phone, internet and satellite television channels.

Demography of the study area

Total population of Sam Sung district was 23000 in 2010 with a density of 197 persons Km^{-2} (Sam Sung, 2010a). The targeted study area was under the sub-district of Huai Toei having a population of 3458 with a density of 88 persons Km^{-2}. All of the population is above poverty line. The number of over sixty year's population is very high (**Table 1**) in the study area (Huai Toei, 2011) as compared to national statistics. In 2005 only 10.3 per cent of Thai population was above 60 years old and in 2015 it is projected to be 14 per cent (UNFPA, 2006). Almost all young people do business or job in different cities and Bangkok. Only aged people and their grand children are left in the villages. Most of the people of the area do the agriculture including organic vegetable production are above 50 years old.

Table 1 Demographic information of Huai Toei sub-district and the study villages in 2010

	Huai Toei sub-district	Ban Sawang	Ban Samhong
Total population	3458	387	394
<14 years (%)	22	16	17
15-60 years (%)	56	59	52
>60 years (%)	22	25	31
No. of households	879	117	126
Avg. household members	3.93	3.31	3.13

Major agricultural activities in the study area

Major crop is rice and among other crops cassava, sugarcane, rubber plantation are dominant. Recently some farmers are growing sugarcane in their rice field due to increased price of sugarcane. Rubber plantation is very new in the study area. Only one farmer started latex collection at the end of 2011. Now farmers are changing their upland sugarcane and cassava fields into rubber plantation. There are also some eucalyptus plantations in the villages. The farmers grow only wet season rice both direct seeding and transplanting. The main rice growing area is the middle and lower paddies. They grow both sticky and non-sticky rice. They grow sticky rice only for their home consumption. In case of sugarcane they use ratoon cropping for two years. They have different fruit trees both in their homesteads and in the farm houses. They also collect wild and natural fruits and vegetable from the forest area. **Table 2** showed the major agricultural land use in the study area (Huai Toei, 2011). Ban Sawang has less agricultural activities than Ban Samhong. Ban Samhong has very high per cent of sugarcane area compared to Ban Sawang; similar to sub-district. Field crops occupied only 28.77 per cent of total land area in ban Sawang, while it was more than twice (64.36 percent) in Ban Samhong. It indicates that Ban Sawang village has more plantation crops than field crops.

Table 2 Agricultural land use in Huai Toei sub-district and the study villages in 2010

Land	Huai Toei sub-district	Ban Sawang	Ban Samhong
Total land area (*rai*)	24604	4057	3148
Land for rice (%)	37.96	27.78	31.77
Land for sugarcane (%)	27.35	0.99	28.53
Land for cassava (%)	8.72	-	4.06

History and present status of organic vegetable production in Sam Sung district

Organic vegetable production was started in Sam Sung district in 2008 under the project entitled "Extension of Safe and Standard Agricultural Production" initiated by district governor. Two villages namely Huai Toei and Ban Sawang under Huai Toei sub-district started to grow pesticide free safe vegetable. 12 households were the pioneer of the present organic vegetable production. District Administrative and District Agriculture office brought them together and made them understand the vision of organic vegetable production. They also brought them to visit another area organic vegetable production to share their idea and experience. Initially each household was allocated an area of 2×4 m^2 public land to grow vegetable near the old temple. They grew pesticide free vegetable and brought it to the district hall. District governor and other staff bought the vegetable 200-300 TB daily. When farmers went to the district hall with their vegetable they also shared their idea and information. In the first year they were succeeded to grow pesticide free vegetable. Then district office did the community analysis and found that many farmers showed their interest to grow pesticide free vegetable.

In the next year (2009) 35 households started to grow vegetable and the area was expanded to 0.5 ha. New households were selected by the previous households based on reliability and worth ability. Sub-district head and village headmen selected a public land beside the village settlement and cleared it and allocated 10×15 m^2 for each of 35 households. But the main problem was there was no irrigation facility. At first farmers irrigated their vegetable plots by themselves. Then they agreed to use the water from village pump and pay bill according to meter reading. Sub-district officers and villagers made the layout and developed the irrigation system. District Administrative and District Agriculture office and Khon Kaen University provided training and extension officers visited the vegetable plots, gave advice and solved the problem. Land development office helped them to supply effective microorganism (EM), organic fertilizer

and the technology how to make organic fertilizer. In this year both number of growers and volume increased and the farmers tried to find their own way to sell it. District Agriculture office helped to some people to set up a carrier with their motorcycles to sell vegetable to nearby and local markets. In the provincial silk festival they organized an exhibition of Sam Sung safe vegetable that drew the attention of central departmental store. Central Marketing Group, Thailand then visited the vegetable plots in Sam Sung and discussed with the district governor and decided to allocate space in the Central Plaza for selling Sam Sung safe vegetable. In 2010 more farmers showed interest to grow safe vegetable and the number of households increased to 85 with an area of one hectare. In the next year 118 farmers grew safe vegetable and the area expanded to seven hectare. Now the number of organic vegetable growing farmers is 115. They grow vegetable in three locations - on the bank of the public pond in the village temple area, beside the village settlement and beside the village reserve forest. The latest location, beside the forest, has a plot size of 10×40 m^2 for each farmer. Farmers of this area grow many types of vegetable; most of them are short duration leafy vegetable (**Table 3**). They also grow fruit and flower types of vegetable, baby corn and galanga. Depending on the vegetable varieties and season some vegetables they can grow round the year and some are seasonal.

Most of the organic vegetable growing farmers in the study area are women: 77 per cent (Sam Sung, 2010b). Most of them are aged people (**Table 4**). Average age of the vegetable growers was 54 years (range: 34-78) with a standard deviation of 8.94. 64.35 per cent vegetable growers were over 50 years old. If it is considered dependent age (>60 years), 25.22 percent falls in this group. This figure indicates that the present Northeast Thailand rural agriculture is based on aged people. While discussing with the key informants and organic vegetable growers it was found that almost all young people were out of the villages. They went to different cities and Bangkok to do jobs or work in the factories and construction farms.

Organic vegetable production system in Sam Sung district has created a scope to use the opportunity labor of the farmers to earn extra money as well as household vegetable need. It does not affect their other agricultural activities. Most labor demand periods of the area are wet season rice planting and harvesting time. Ban Sawang village has very few agricultural activities except wet season rice (**Table 4**). On the other hand the aged farmers especially women can't go to city to sell their labor. In most cases it is not possible to go outside to sell opportunity labor especially for aged people. They also have to stay in their home and take care of their grand children whose parents have gone for work in the cities.

Table 3 List of common vegetable grown in Sam Sung district by the vegetable growing farmers' group in 2012

Sl.No.	Thai name	Common name	Scientific name
01	Khana	Chinese kale	*Brassica alboglaba* L.var.*acephala*
02	Pak gard horm	Lettuce	*Lactuca sativa*
03	Pak kwang toong	Chinese flowering cabbage	Brassica rapa var. parachinensis
04	Pak gard bai	White cabbage	*Brassica rapa chinensis*
05	Kuen chai	Chinese celery	*Apium graveolens*
06	Hom dang	Shallot	*Allium cepa* L. var. *ascalonicum*
07	Ton horm	Spring onion	*Alium fistulosum*
08	Kui Chai	Garlic chives	*Allium tuberosum*
09	Pak chi	Coriander	*Coriandrum sativum* L.
10	Pak chi farang	Sawtooth coriander	*Eryngium foetidum*
11	Pouy lengh	Spinach	*Spinacia oleracea*
12	Pak prang	Indian spinach	*Basella alba* L. and *B. rubra*
13	Thoa poo	Winged bean	*Psophocarpus tetragonolobus*
14	Ma kua	Brinjal, Eggplant	*Solanum xanthomcarpum*
15	Ma kua puang	Cherry eggplant	*Solanum aguivi* Lam.
16	Malakor	Green papaya	*Carica papaya*
17	Khao poad on	Baby corn	*Zea mays L.*
18	Ma kua thade	Tomato	*Lycopersicon esculentum*
19	Cha oam	Climbing wattle	Acacia pennata
20	Pak boong	Water spinach	*Ipomaea aquatica*
21	Tua fak yao	Yard long bean	*Vigna sesquipedalis*
22	Prik kienu	Hot pepper	*Capsicum frutescens*
23	Prik yai	Chili	*Capsicum annuum*
24	Fak thong	Pumpkin	*Cucurbita maxima*
25	Kra jeab kiaw	Okra	*Hibiscus esculentus* Linn.
26	Bouab lium	Angle loofah	*Luffa acutangula* Roxb.
27	Bouab	Smooth loofah	*Luffa aegyptiaca*
28	Bouab ngu	Snake gourd	*Trichosantes cucumerina*
29	Khing oan	Young ginger	*Zingiber officinale*
30	Bai ho ra pa	Sweet basil	*Ocimum basilicum* L.
31	Kapraow	Holy basil	*Ocimum sactum* L.
32	Bai maeng lak	Lemon basil	*Ocimum canum* L.
33	Bai sara nae	Mint	*Mentha arvensis*
34	Kah	Galanga	*Languas galanga*
35	Kra chai	Chinese ginger	*Boesenbergia pandurata*
36	Hua plee	Banana flower	*Musa spp.*
37	Pak chi lao	Dill	*Anethum graveolens* L.
38	Mara	Bitter melon	*Momordica charantia*
39	Bai makood	Kaffir lime leaves	*Citrus hystrix*
40	Bai toey	Pandan leaves	*Pandanus amaryllifolius*
41	Ta krai	Lemon grass	*Cymbopogon citratus* L.
42	Pak phai	Polygonum	*Polygonum odoratum*

Table 4 Age group of vegetable growers at Ban Sawang and Ban Samhong villages in 2010

Farmer's age (year) group	No. of Male	No. of Female	% of Total
34-40	1	7	6.96
41-50	10	23	28.70
51-60	8	37	39.13
61-70	7	20	23.48
71-78	1	1	1.74
Total	27	88	100

Quality control of organic vegetable

Organic vegetable growers in Sam Sung district do not use any inorganic fertilizer or any synthetic chemical or pesticide. They use their homemade compost, livestock manure, and buy organic fertilizer from the organic fertilizer producing group. They use bio-extract and mechanical and cultural practice to control pest and diseases though sometimes it is not enough to control pest and diseases. They keep their vegetable plots weed free that helps to reduce pest and disease infestation. If they can't control pest and diseases by this way they simply uprooted the vegetable and sell it to the local markets at a low price. Farmers try to do their best to produce their vegetable that passes the quality fixed by the cooperative. Since 2010 some farmers got GAP (Good Agricultural Practice) certificate for their good practice. District agriculture extension personnel visit the vegetable plots frequently and advise the farmers how to control pest and disease, and how to grow healthy and vigorous vegetable.

Cooperative and entrepreneur groups

A cooperative was established in 2010 and it started to operate on 23 September in the same year. The daily activities of the cooperative are performed by its staff. The duty of the cooperative is to receive vegetable from the member farmers, test the vegetable if it has any hazardous residues or not, process, package, and supply it to super markets in Khon Kaen and Bangkok. The cooperative has a processing centre with a cooling store. Initially it was established by the Central Marketing Group, Central Group of Companies, Thailand but now it runs by its own income. Cooperative send packed vegetable to Central Plaza, Khon Kaen six days and to Bangkok twice a week. Cooperative distributes its profit among the members at the end of the year. It also does some social welfare work. Cooperative receives vegetable first to observe their vigor, freshness and good appearance and then test it by Medscipest Kit developed by the Department of Medical Science, Thanon Tiwanon, Amphur Muang, Northburi-11000. At present the total number of cooperative members is 278. Besides cooperative there are another two entrepreneur groups under Government registration, namely organic vegetable group and organic fertilizer group. Organic fertilizer group produce organic fertilizer and sell it to the vegetable growers. All members of the last two groups are the members of the cooperative.

Support from Government and other agencies

The starting of the journey was a top down project initiated by the former district chief of Sam Sung district. It was a heavily Government subsidies project initially but most of the money was spend to develop infrastructure and capacity building of the vegetable growers rather than direct cash subsidy. Govt. allocated public land and made it suitable for vegetable growing, set up water pump and developed irrigation system and build up a road to the vegetable plots. District Administrative and District Agriculture Extension office provided training on safe/organic vegetable production and quality control. They also brought the farmers to nearby districts and provinces for exposure visits to learn by seeing.

Faculty of Agriculture, Khon Kaen University also provided training to the vegetable growers. Department of Land Development helped them by supplying organic fertilizer, effective microorganism (EM) and the technology how to make organic fertilizer. Central Marketing Group, Thailand helped them to build up the processing center with a cool room. District Administration organizes different departments and institutions to strengthen the capacity building of the organic vegetable growers.

Conclusion

The policy of Thai Government in promoting organic agriculture is mainly based on high financial support. That is why after withdrawal of government support it collapses. But in Sam Sung most of the government support was used to develop infrastructure and capacity building of the farmers rather than direct cash subsidy. Along with the presence of natural resources, like very shallow underground water available round the year and sloping topography suitable for drainage during the rainy season, establishing farmers' organizations, strengthening their capacity building by providing knowledge and infrastructure development, establishing backward (organic fertilizer producing group) and forward linkage (cooperative for vegetable packaging and marketing) created a favorable environment to run the organic vegetable production system in Sam Sung district. It has created a scope to use the opportunity labor of the old farmers especially women who cannot go to the city to sell their labor. They get an extra income from the vegetable that also helps to stay stand the system. However, to ensure the long lasting operation of the system the implementation of the Govt. policy has to be very careful so that the farmers can stand on their own feet after withdrawal of Govt. support, i.e., to empower them to manage their own network and production system.

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