Article

Survival Strategy of Rice Farmers in Planting Paddy in Dry Season

Komunitas: International Journal of Indonesian Society and Culture
12(2) (2020): 163-170
DOI:10.15294/komunitas.v12i2.23920

p-ISSN 2086 - 5465 | e-ISSN 2460-7320
http://journal.unnes.ac.id/nju/index.php/komunitas

UNNES JOURNALS

Thriwaty Arsal[1], Mahmud Yunus[2], Eko Handoyo[3],Sakaria Ahmad[4]

[1,2,3,4]Department of Sociology and Anthropoligy, Faculty of Social Science, Universitas Negeri Semarang

Received: February 25th 2019; Accepted: March 01st 2020; Published: September 30th 2020

Abstract

The development of agricultural tools and technology has made a change to cropping patterns in agricultural communities in Donoyudan Village. Farmers begin to plant rice in the dry season with the help of water wells as the main source of irrigation. Farmers choose to plant rice in the dry season because the results are better than the rainy season. The purpose of the research is to determine the survival strategies of paddy farmers in choosing plant species on agricultural land in the dry season. The research method uses qualitative methods, namely observation, triangulation, and in-depth interviews with farmers and farmer groups. The research is conducted in Donoyudan Village, Kalijambe District, Sragen Regency. The results show that the survival strategy of paddy farmers and rice farming activities in the dry season is the availability of water wells and water pumping machines as the main sources of irrigation in the dry season. Water wells are used if there is not enough rainwater to irrigate the fields. There are two types of water wells, which are shallow well and deep well.

Keywords

dry season; rational choice; rice farmers

INTRODUCTION

Mu'min (2014) defined agriculture as a human activity of utilizing natural resources to produce foodstuffs, industrial raw materials or energy sources and to manage environment. Agricultural activities in Java Island is conducted intensively based on a comparison between agricultural land area and land area (Thiede & Gray, 2017). Naylor et al., (2007) stated that Indonesia agriculture is dominated by West Java, Central Java, East Java, and Bali Provinces. The three provinces contribute more than 50% of rice demand in Indonesia. MacMillan (2014) conveyed that one of alternatives to advance farmers' welfare is by providing a thinking pattern to develop agriculture; if farmers' thoughts could be well developed, it will improve their welfare and increase state income. This should be done in a developing country, including Indonesia.

Koentjaraningrat, (1994: 172) stated that there are three types of agricultural land utilization in Java, namely: yards, upland fields, and rice fields. Farmers conduct rice farming activities in a rice field since rice requires more water than other crops. According to Thiede & Gray, (2017: 155), in

Corresponding author
Jl. Raya Sekaran Gunungpati Semarang
Email
thriwaty_arsal@mail.unnes.ac.id

addition to its nutrients content, rice field has the ability to hold water better than upland fields or yards. As a result, farmers prefer rice fields as their agricultural land to be planted with rice to upland fields or yards.

Rice field agricultural activities are crucial for farmers since they generally consider rice crop as their main crop. Rice produce is used as family consumption needs as well as sold to fulfill other needs. Koentjaraningrat (1994:172) asserted that rice field is grouped into two: irrigation and rainfed rice fields. Irrigation rice field is a rice field where its main irrigation comes from a reservoir or river. Rainfed rice field is a rice field that relies more on rainfall as its main irrigation source. Sari et al., (2013) explained that the main weakness of rice farming in Indonesia is its dependency on rainfall as the main irrigation source. A rice field with good irrigation could produce three rice harvest periods, whereas rainfed rice field produce two rice harvest periods although there are other rainfed rice fields that produce three rice harvest periods with dry season cultivation. Mainuddin (2014) explained that dry season will change crop's water requirement due to the hot environment and as a consequence, small potential of harvest success if no good irrigation available to offset it. Mainuddin (2013) also asserted that planting rice in the dry season could avoid flood that could damage the crops and causes harvest failure. Hence, if water availability is sufficient, dry season could be an appropriate time to plant rice.

Various strategies are applied by farmers to survive and one of the strategies is dry season rice farming. According to Chairi (2015), various farmers' survival strategies to add income to fulfill their needs during the dry season include 1) saving, 2) entrepreneurship and service, 3) debt, and 4) Gapoktan institution utilization. Agustine (2018) stated that adaptation strategies applied by rainfed farmers in dry season consist of active, passive, and network strategies. The active strategy is applied by looking for side jobs other than farming. The passive strategy includes reducing their daily expenses. Network strategy, on the other hand, is conducted by borrowing in a food stall.

Rahmadi and Santoso (2016) explained that various income alternatives are carried out by ricefield farmers in Kolomayan Village to fulfill their household livelihood using their own social capital, such as livestock activities, take a loan, and mutual assistance in agricultural land cultivation.

One of strategies done by farmers at Donoyudan Village is by planting rice in dry season. Donoyudan Village has 384,348 ha of agricultural land which runs along the Donoyudan Village roads. The upland areas consist of 65,339 ha, whereas rice field area is 192,174 ha. All rice fields located in Donoyudan Village are rainfed rice fields since it does not have irrigation from rivers, reservoirs, and dams. Its main irrigation source is rainfall; however, there are farmers at the village who are persistent to plant rice during dry season. The condition has put rice fields in the village as a rainfed rice field that could produce rice throughout the year.

Donoyudan farmers previously perform a diversification or crop type change during dry season before they choose to plant rice all seasons. According to Walker (2015) diversification is defined as an effort to increase produce by through treatment or product diversity in production. Tarbiah et al., (2010: 105) stated that diversification could maintain and improve soil structure; hence, it guarantees production system sustainability. The diversification practice conducted by Donoyudan farmers is by planting secondary crops (*palawija*) after two rice planting seasons. The farmers generally plant *palawija* during dry season; however, there is a group of farmers who abandons the system and shifts to rice planting in the field throughout the year including in the dry season from May to August. They use artesian well as an irrigation source to irrigate their field during the dry season.

Sari et al., (2013:7) explained that the weakness of agriculture in Indonesia is related to the conventional way of thinking and thinking pattern. For example, a mindset for not planting rice during dry season due to the low water availability during the season.

The conventional way of thinking and

thinking pattern has started to be abandoned by Donoyudan farmers. It is indicated by farmers who still plant rice during the dry season although their fields are a rainfed rice field. They build an artesian well to be used as the main irrigation source to irrigate the rice crops during the dry season. The use of the artesian well will add agricultural production cost incurred by farmers. In addition, the well availability is limited; thus, farmers are at risk of being unable to use the well when the rice requires watering, especially if water discharge of the well is limited. As a consequence, rice harvest failure could occur if water in the well is no longer available.

Formulation of problem: what is the rice field farmers' life strategy in planting rice during the dry season?

METHODS

The research location was at Donoyudan Village, Sragen, Central Java. The research informants included farmers and farmer group. The informants were selected using stratified random sampling (Danim, 2004). A qualitative research was used to describe and understand activities performed by farmers during rice planting and irrigation. The research wanted to know what was the process and method of rice planting that was conducted by farmers during the dry season both using shallow and deep artesian wells. Regarding the research, the analysis unit was individual with assumption that individual act in performing rice planting activity in the rice field was supported by various aspects, especially economic aspect by following Weber's (Weber, 1964; Ritzer, 2003; Nugroho, 2000) terminology, which was methodological individualism. Qualitative data analysis was conducted on event information and motivation that triggered social action of the related actors in rice planting, irrigation, and harvesting processes associated with social act. Data collection technique and validation were done using observation, interview, documentation, and data triangulation.

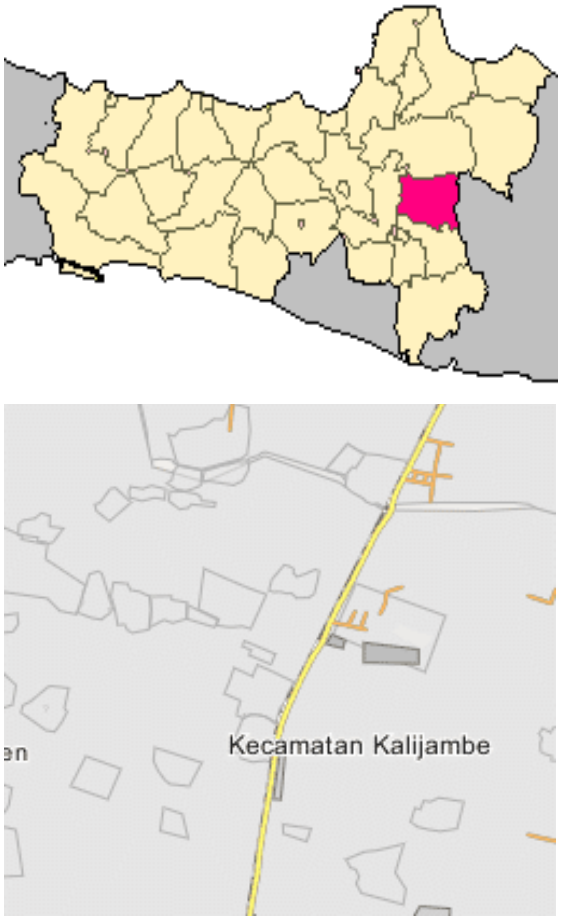

Figure 1. Map of Sragen Regency Map of Donoyudan Village, Kalijambe

RESULTS AND DISCUSSION

Geographical Condition

Administratively, Donoyudan Village is located at Kalijambe Sub-district, Sragen Regency, Central Java Province. The western part of the village is directly bordered with Boyolali Regency. District line road stretches in the middle of the village connecting Sragen Regency and Boyolali Regency. The road becomes the main road for daily mobility of the villagers. The distance of Donoyudan Village to the government office of Sragen Regency is 31 km. The condition requires the villagers to travel for an hour to take care of their administrative needs in the regency. The village is a low land area of 384.348 Ha. The land is divided into four areas based on its utilization. The land area division is presented in Table 1.

Table 1. Land Utilization Distribution

No	Land Utilization	Area	Percentage
1	Housing and yard	80.713 ha	21%
2	Dry land	65.339 ha	17%
3	Rice field	192.174 ha	50%
4	Other	46.121 ha	12%
	Total	384.348 ha	100%

Source : Profile Data of Donoyudan Village

Based on Table 1, the village total area is 384.348 ha, whereas the rice field area is 192.174 ha, owned and cultivated by the villagers. Agriculture in the village was dominated by rice field agriculture with rice as the main crop. Rice farming activity is a part of the villagers' social and economic life since the village environment is very supportive; hence, rice crops could grow well. In addition to rice, the villagers also plant ground nut, maize, and chili during the dry season. The agricultural activities are supported by large agricultural area that covered 50% of the village area. Agriculture in the village depends on rainfall as the main irrigation source. Naylor et al., (2007: 7753) conveyed that most rice produce will increase during the rainy season; in addition, Central Java area includes in an area with high rainfall in December – January.

Agricultural Activities

Donoyudan farmers practiced farming knowledge and method according to their ancestors'. The agricultural knowledge included land cultivation techniques, crop selection, and season calculation. According to season calculation calendar of Donoyudan farmers, one year was divided into three planting seasons based on the rain fall: *mongso labuh, mongso rendeng,* and *mongso ketigo*. It was this knowledge of planting season that became guidance for farmers in their agricultural activities by planting a suitable crop type. The division of planting season was in line with a statement by Caruso & Ricciuti, (2016: 68) regarding the existence of rice planting calendar, which was started from August for land preparation such as plowing, digging, land cultivating, and ground leveling. Seedling was conducted in early October to December where rainfall is high. A season with less water availability would generate low produce if rice planting is performed; in this case it is called *musim paceklek*.

Mongso ketigo is started from June to September. According to farmers, the season is a season with the least rain fall. *Mongso Labuh* is the initial planting season for farmers and it is started from October to January. *Mongso labuh* is marked by the falling rain. *Mongso rendeng* is a planting season that is started from February to May. The season is a planting season with the highest rainfall. Naylor et al., (2007:7753) conveyed that rice farming activities are mostly started in early December to January since rain fall is high during this period; thus, weed seedlings could not grow well.

Agricultural Development in Donoyudan Village

Donoyudan farmers used *mongso* (seasonal) knowledge as a reference to carry out agricultural activities. The advancement in science and knowledge had gradually changed the agricultural activities in the village. Some of the changes included the existence of artesian well as a facility for water supply, irrigation as a water flow, and rice planting activities in the dry season by farmers.

Agriculture with One Rice Harvest Period in a Year

Previous farmers at Donoyudan Village performed agricultural activities in a traditional way by using one rice harvest period in a year. The activities still used manure because farmers had not familiarized with chemical fertilizers yet. Rice field irrigation also depended on rainfall. Plowing was conducted using a plowing tool pulled by cows known as *brujul*. The traditional agricultural activity pattern was highly depended on rainfall for irrigation. In *mongso ketigo*, rice fields were planted with pumpkin, chili, and cucumber. Donoyudan farmers often called those four crops as *sambung urip* crops. Naylor et al. (2007: 7753) stated that Indonesia, especially Java Island and Bali Island, make

the rainy season as a key of farming process since the agricultural land is a rainfed and river irrigation.

Agriculture with Two Harvest Periods in a Year

Agriculture with two harvest periods was started to be conducted after the introduction of chemical fertilizers and superior seeds to the village. The superior seeds were different to those seeds inherited from generation to generation, which is only be harvested in May, since the seeds could be harvested every three months. The chemical fertilizers were also being used by farmers as a substitute for manure. The fertilizers had faster reaction in plant compared to manure. Plants would grow faster with chemical fertilizers than those with manure. The existence of chemical fertilizers encouraged farmers to use more of the fertilizers than manure. Superior rice seeds and chemical fertilizers were a capital package for farmers to generate harvest more than one period in a year.

The presence of superior rice seeds and chemical fertilizers did not immediately change the farming method in the village. The one harvest period in a year in rice farming was ended when farmers started to plant rice in *mongso labuh*. Rice planting in *mongso labuh* was not immediately applied by all Donoyudan farmers. Based on an informant account, despite the use of superior seeds, there were farmers who still planted rice in *mongso rendeng* only. It was due to the farmers' concern regarding the availability of rainfall in *mongso rendeng* that might insufficient for rice growth.

Agriculture with Three Harvest Period in a Year

Agricultural activities that produced three harvest periods in Donoyudan village was closely related to the existence of artesian well and water pump machine. The water pump machine was known as *disel* among the farmers. According to an informant, the well and *disel* started to be used in the end of 1970. At the beginning, the well construction was based on a seasonal change phenomenon. *Mongso ketigo*, which is a dry season, often came early. The season usually starts in June; but it sometimes starts in April. The condition had brought harvest failure for rice planted in *mongso rendeng* since the rain no longer fell.

Figure 2. Shallow artesian well

Shallow Artesian well technology and *disel* used by Donoyudan farmers created some changes in the agricultural pattern. Initially, the well construction was designated as a water source if planting season in *mongso rendeng* experienced lack of water. During *mongso ketigo* the rice fields were previously planted with *sambung urip* crops only or left unplanted (*bero*). The_presence of the well and *disel* persuaded the farmers to grow more profitable crops in the *mongso ketigo*. The Donoyudan farmers started to try to plant *palawija* in the season in the end of 1970.

Table 2. Changes in Planting Pattern during Dry Season

No	Year	Irrigation Source	Crops in Dry Season
1	Before 1960	Rain water	*Sambung urip* crops
2	± 1960	Rain water	*Sambung urip* crops
3	± 1970	Artesian well	*Palawija*

Source: primary data

As a consequence of the use of artesian well as an irrigation source during the dry season, planting pattern in Donoyudan village changed. In 2010, farmers began an all year long rice farming activities that included rice farming during the dry season.

Rice Farming Activities during the Dry Season

Based on the season calculation, the *mongso ketigo* fell during the dry season. The fact discouraged the farmers to plant rice during the season. They were worried that the rice would not grow well despite the existence of the artesian well as an irrigation source. They preferred to plant *palawija* during the dry season. Types of *palawija* crops commonly planted during *mongso ketigo* were ground nut, maize, and chili with ground nut as the most planted crop.

Rice requires a lot of water to grow compared to *palawija* crops. Donoyudan farmers were initially never planted rice in the *mongso ketigo*. It was different to farmers in Saren Village who often planted rice during the season. Information about the Saren farmers was stated by Mr. Baserun, the first farmer who planted rice in *mongso ketigo* and gained profit from it. Rice yield during the *mongso ketigo* was the best compared to other seasons. Rice planted in the season tended to be safer from pest; thus, better yield. Despite the advantage, there were also some obstacles in planting rice during the *mongso ketigo*. One of the obstacles related to the large amount of capital incurred for rice irrigation. Another advantage of rice farming during the season was the production of hay after harvest. The hay is the main feed for cattle.

Culturally, agriculture is a rainfed. Rice is a rice field crop that is often planted during the rainy season. As well as Donoyudan farmers, they firstly planted rice only in the rainy season. The rice farming pattern was a form of adaptation by rainfed rice field farmers who relied on rainwater as the irrigation source. Various information and technology advancement had changed rainfed agricultural culture in Donoyudan Village. Currently, rice crop had been planted during the dry season, which was never existed before.

Figure 3. Agricultural activity

Dry season rice farming conducted by Donoyudan farmers was based on farmers' rationality towards their resource. The resource was the artesian well because it is the main irrigation source during the dry season. Applying the dry season rice farming suggested that farmers would depend on the artesian well to irrigate their rice fields. The farmers' dependency on the artesian well during the dry season making the rice farming in this season carried a big risk.

Farmers who applied the dry season rice farming usually irrigated their rice fields every three days using the artesian well. The key issue of the farming was the limited number of artesian well, which was unequal to the number of farmers who performed the farming. As a consequence, the artesian well was used in a daily basis by the farmers alternately and even twice or more a day. Harvest failure risk occurred if the number of water in the well was no longer sufficient to irrigate the farmers' rice fields. The artesian well became the main water source to irrigate rice crops in the *mongso ketigo*. It was an obstacle since not all farmers had their own well; hence, they would share the well with others. Those farmers who had their own well would use the well alternately with other farmers to irrigate the rice crops.

Hedström & Ylikoski's (2014: 60) research result elaborated that an individual attention span towards something expanded to easily obtain prosperity even if there were concerns when doing the results of

the thought. In the current research, Donoyudan farmers expanded their attention to profit gained when conducting agricultural activities in the dry season. Planting process in the dry season supported the rational option by considering various weaknesses related to.

Figure 4. Deep artesian well

The Donoyudan farmers act as a rationality actor in rice farming and the artesian well was a resource during the *mongso ketigo*. Farmers' rationality to plant rice during *mongso ketigo* was based on various factors supporting the option; one of them was water pump machine. The supporting factors and resources allowed the farmers to plant rice in the *mongso ketigo* (dry season) regardless the unavailability of river and dam irrigations. In addition, there was another consideration to plant rice, which was hay production as cattle feed.

The artesian well used by the farmers during the dry season supported rice availability and demand. It is supported by Naylor et al., (2007: 7756) in an article "*Assessing risks of climate variability and climate change for Indonesian rice agriculture*" that resources used in the development of water storage and irrigation infrastructures will be crucial to offset water requirement during the dry season and rainy season. Triyanto (2006: 67) stated that artesian well could help extent the rice production cycle; thus, it could meet the dry season demand. The use of artesian well could be a solution to keep planting during the dry season.

The Causative Factors of the Occurrence of Rational Option of Donoyudan Rice Farmers

In 2010 rice farming activity in the *mongso ketigo* was an agricultural pattern newly adopted by the Donoyudan farmers. The activity was not directly applied by all Donoyudan farmers. Up to now, the number of farmers who applied the pattern had increased although some of them still planted *palawija*. There were various causative factors in the preference of some farmers to plant rice than *palawija* during the *mongso ketigo*.

The underlying factors for farmers to plant rice during the dry season is Easier plant irrigation, simple harvesting process, advantage of obtaining hays, the existence of artesian well as an irrigation source.

A variety of factors from rational option continue to exist that would influence farmers to maximize resources and generate maximum profit. According to Khalil, (2017) in *Socialized View of Man vs. Rational Choice Theory: What Does Smith's Sympathy Have to Say?* Rational choice relates to action calculation by considering consequences instead of intention; it is in line with various factors that encourage farmers to consider an option to plant rice during the dry season.

CONCLUSION

Donoyudan farmers act as a rationality actor in rice farming and artesian well as a resource during *mongso ketigo*. Farmers' rationality to plant rice during the *mongso ketigo* was based on various factors supporting the option, one of them was water pump machine. The supporting factors and resource allowed the farmers to plant rice in *mongso ketigo* (dry season) regardless the unavailability of river and dam irrigations. In addition, there was another consideration to plant rice, which was hay production as cattle feed. Farmers still planted rice during the dry season as one of survival strategies by obtaining income from the rice farming

both in form of money and goods. It was related to rice farmers' income that depended on the success in processing agriculture, especially rice, as the main livelihood source of farmers in Donoyudan Village.

REFERENCES

Agustine, D. 2018. Adaptasi Petani Sawah Tadah Hujan terhadap Penurunan Produktivitas Padi (Gagal Panen) di Jorong Sungai Salak Kabupaten Tanah Datar. *Jurnal Online Mahasiswa*. 5(1): 1–14.

Broda, A., Krüger, J., Schinke, S., & Weber, A. 2018. Determinants of choice of delivery place : Testing rational choice theory and habitus theory. *Midwifery*. 63(November 2017), 33–38. https://doi.org/10.1016/j.midw.2018.04.023

Chairi, A. 2015. Strategi Bertahan Hidup Petani saat Musim Kemarau. *Jurnal Mahasiswa Sosiologi*. 2(4): 1–21.

Hedström, P., & Ylikoski, P. 2014. Analytical Sociology and Rational Choice Theory. *Helda*. 57–70.

Khalil, E. L. 2017. Socialized View of Man vs . Rational Choice Theory : What Does Smith ' s Sympathy Have to Say ? *Journal of Economic Behavior and Organization*. 143(3): 223–240. https://doi.org/10.1016/j.jebo.2017.09.003

Koentjaraningrat. 1994. *Kebudayaan Jawa*. Balai Pustaka. Jakarta Timur. Retrieved from https://books.google.co.id/books?id=uKHaGAAACAAJ

MacMillan, T. 2014. Engage farmers in research. *NATURE*. 509: 25–27.

Mainuddin, M., Kirby, M., Ahmad, R., & Chowdhury, R. 2014. Spatial and temporal variations of , and the impact of climate change on , the dry season crop irrigation requirements in Bangladesh. *Irrigation Science*. 33(2): 107–120. https://doi.org/10.1007/s00271-014-0451-3

Mainuddin, M., Kirby, M., & Thai, C. 2013. Impact of climate change on rainfed rice and options for adaptation in the lower Mekong Basin. *Natural Hazards*. 66(4): 905–938. https://doi.org/10.1007/s11069-012-0526-5

Mu'min, A., Hastuti, K., & Angriani, P. 2014. Pengaruh Diversifikasi Pertanian Terhadap Pendapatan Masyarakat di Desa Belawang Kecamatan Belawang Kabupaten Barito Kuala. *Jurnal Pendidikan Geografi*. 1(3): 8–20.

Naylor, R. L., Battisti, D. S., Vimont, D. J., Falcon, W. P., & Burke, M. B. 2007. Assessing risks of climate variability and climate change for Indonesian rice agriculture. In *Proceedings of the National Academy of Sciences*. 104: 7752–7757.

Rahmadi, P. Zanuar dan B. Santosa. 2016. Modal Sosial Petani Sawah Berlahan Sempit Dalam Pemenuhan Nafkah Rumah Tangga. *Jurnal Analisa Sosiologi*. 5(1).

Ritzer, G., & Goodman, D. J. 2009. *Teori Sosiologi Modern*. *Prenada Media*. Kencana. Jakarta.

Sari, A. D., Pusfitasari, N., & Rahma, R. 2013. Design and Evaluation New Rice Planter Tool without Mechanical Engine for Improving Conventional Farmer ' s Posture as Revival of Agriculture ' s Indonesia. 10: 116–121. https://doi.org/10.4028/www.scientific.net/AEF.10.116

Tarbiah, S., Raharja, S., & Purwanto, B. 2010. Kajian Tingkat Pendapatan Petani Sawah Irigasi dengan Diversifikasi Pola Tanam di Kabupaten Karawang, Jawa Barat. *Jurnal Manajemen Pengembangan Industri Kecil Menengah*. 5(2): 101–110.

Thiede, B. C., & Gray, C. L. 2017. Heterogeneous climate effects on human migration in Indonesia. *Population and Environment*. 39(2): 147–172. https://doi.org/10.1007/s11111-016-0265-8

Triyanto, J. 2006. *Analisis Produksi Padi di Jawa Tengah*. Semarang. Retrieved from http://eprints.undip.ac.id/15686/

Walker, C. L., & Shore, B. M. 2015. Understanding Classroom Roles in Inquiry Education : Linking Role Theory and Social Constructivism to the Concept of Role Diversification. *SAGE Open*. 5(4): 1–13. https://doi.org/10.1177/2158244015607584

Zafirovski, M. 2014. Rational Choice Requiem: The Decline of an Economic Paradigm and its Implications for Sociology, 432–452. https://doi.org/10.1007/s12108-014-9230-0

Zafirovski, M. 2016. Toward Economic Sociology/ Socio-Economics ? Sociological Components in Contemporary Economics and Implications for Sociology. *The American Sociologist*. 47: 56–80. https://doi.org/10.1007/s12108-015-9289-2