

The background of the cover is a complex architectural blueprint in white lines on a dark blue background. It features various geometric shapes, including rectangles, circles, and arcs, representing floor plans and structural elements. The lines are thin and precise, creating a technical and professional appearance.

Routledge Advances in Management and Business Studies

DEVELOPING THE WORKFORCE IN AN EMERGING ECONOMY

THE CASE OF INDONESIA

Edited by

Kantha Dayaram, Linda Lambey, John Burgess
and Tri Wulida Afrianty



Developing the Workforce in an Emerging Economy

This edited volume examines how forces of globalization and demographic and technological change are manifested and accommodated in an emerging economy such as Indonesia, which has a large workforce pool.

Using the human resource development framework, the book explains the opportunities and challenges in developing human capabilities to support current and future living standards. It looks at human development challenges across the spectrum of workforce skills and across the spectrum of formal and informal labour markets. Through the case study on Indonesia, this book presents many of the features and issues that are present in emerging economies as they grapple with human resource development in the globalized and networked era.

This book will appeal to researchers and policy makers working in the areas of human resource and economic development.

Kantha Dayaram is Associate Professor of Human Resource Management and Employment Relations at Curtin University. Her research publications are in labour relations, the aging workforce and women's work participation. Her research interests are in labour regulation, health and well-being and policy development.

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Foreword

Indonesia is well placed with its growth trajectory. It is the fourth largest in East Asia and the world's tenth largest economy in terms of purchasing power parity. The Indonesian economy has shifted from heavy dependence on the agricultural sector to the services and industry sectors. This shift has been accompanied by changes to employment generation, education, productivity and real wages growth. Indonesia has a long-standing relationship with agencies such as the UNDP, the ILO and NGOs and is working towards the development of an institutional and legislative framework to support decent work and programs to develop infrastructure and generate local jobs.

I invite you to share the knowledge in this book, which succinctly brings together the themes of Indonesia's human development by examining specific contexts such as regions, industries, enterprises, professions and skill groups. The book covers with deep insight issues linked to human development, such as the transitioning from education to employment, skills development, the impact of the fourth industrial revolution encompassing digitalization and the position of women in developing economies.

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Abbreviations

4IR	Fourth industrial revolution
ASEAN	Association of Southeast Asian Nations
B2B	business to business
CEDAW	Convention on the Elimination of All Forms of Discrimination against Women
CIA	Central Intelligence Agency (USA)
ERP	enterprise resource planning
ESI	Employment Situation Index
FDI	foreign direct investment
FFM	five-factor model
FGD	focus group discussion
GDP	gross domestic product
GNI	gross national income
GRB	gender-responsive budgeting
GWR	graduate work readiness
HCI	Human Capital Index
HDI	Human Development Index
HE	higher education
HELTS	higher education long-term strategy
HRD	human resource development
HRM	human resource management
IAI	Ikatan Akuntan Indonesia
ICT	information and communications technology
IDR	Indonesian Rupiah
IFLS	Indonesian Family Life Survey
ILO	International Labour Organization
IMF	International Monetary Fund
MEC	Ministry for Education and Culture
MOL	Ministry of Labour
MoU	memorandum of understanding
NGO	non-government organization
NQF	National Qualifications Framework
OECD	Organisation for Economic Co-operation and Development

OH&S	occupational health and safety
RPL	recognition of prior learning
SMEs	small and medium enterprises
SMK	Sekolah Menengah Kejuruan
T&D	training and development
T&T	travel and tourism
UN	United Nations
UNDP	United Nations Development Program
VET	vocational education and training
WBL	work-based learning
WCU	world-class university
WEF	World Economic Forum
WPD	workforce planning and development

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4 Building a sustainable rural workforce in Indonesia

Bulan Prabawani and Hari Susanta Nugraha

Introduction

Rural workforce sustainability is becoming and will continue to be a critical issue not only for Indonesia, but also globally (Thiede et al., 2016; Chen et al., 2018; Belton and Filipksi, 2019). Indonesia is an agricultural country with abundant resources and fertile soil. It also has a history as a producer of commodity exports, including rubber, tobacco, sugar cane, tea and coffee. The contribution of this sector to GDP was IDR 80,035.8 billion in 2019 (Trading Economics, 2019). But the International Labour Organization (ILO, 2019) notes that employment in agriculture from total employment in Indonesia shows a decrease. In Indonesia, the share of the rural population shows a decline; the population in rural areas in 2017 was 50.2% of the total population. It is predicted to continue to decline to a 33.4% share in 2035 (BPS, 2013). Moreover, the population working in the agricultural sector was 50% in 1991; it was 30% in 2018. The majority of agricultural sector workers are aging (Susilowati, 2014; Thurlow et al., 2019) and no longer work as farmers, but as share farmers or farm labourers (Chand and Srivastava, 2014; Guo et al., 2015). In an effort to improve the contribution of the agricultural sector, education is often deemed a pathway to a better future for rural youth and for the rural sector. However, agricultural education and training in general has not generated a new generation of professional farmers. Many graduates of the Agricultural Institute actually do not become farmers or work in the agricultural sector. Agricultural graduates tend to be more involved in the trade and processing of agricultural products in urban areas. Hence, a discussion of developing a sustainable rural workforce in Indonesia is required to support this key sector and also to support rural development. To address this issue, the chapter is structured as follows: a) Indonesia's agricultural sector and its contribution to the economy, b) the Indonesian agricultural workforce, c) outlining the concepts of migrant risen rural migration and pluriactivity, d) workforce development schemes and e) social partnership, followed by a conclusion.

Indonesia's agricultural sector and its contribution to the economy

The agricultural sector has an important role in the Indonesian economy, e.g. on economic growth, meeting the food supply, foreign exchange earnings and

employment. The agricultural sector is an important provider of raw materials for industrial needs, particularly the food and beverage processing industry (agro-industry). The agricultural sector is also a major pillar in sustaining the country's food security through its contribution to the sufficiency of consumption of the majority of the Indonesian people, especially in food supply (Sugiantawan et al., 2013).

The industrial and service sectors have increasingly contributed to Indonesia's GDP since 1965. The industrial sector contributed 13% to GDP in 1965, and this increased to 40% in 2017. Likewise, the service sector contributed 36% in 1965 and 46% in 2017. In contrast, the contribution trend of the agricultural sector continues to decline, from 51% in 1965 to 14% in 2017 (Indonesia-Investments, 2018). Prices for agricultural products have been stagnant, with a study by Prabawani et al. (2019) in rural communities in South Kalimantan showing that the prices of agricultural products have declined, while the prices generated in the industrial sector have continued to increase. This keeps wages and incomes for the sector low and encourages labour to move to the cities in search of waged jobs in the manufacturing and service sectors.

However, the Ministry of Agriculture has noted the increased value of agricultural exports, with the value of Indonesia's agricultural exports to China in 2018 reaching US\$4.025 billion, almost doubling exports of the previous year. According to Sumodiningrat and Kuncoro (1991 in Bahri and Paman, 2012), the agricultural sector is an important source of growth in terms of providing both raw materials and food, as well as purchasing power for products produced by other sectors. In addition, growth in the agricultural sector, as well as in the rural non-farm economy, is needed to reduce rural poverty and narrow the gap between rural and urban regions (Aswadi, 2017).

Indonesia's agricultural workforce

The public perception of the agricultural sector is of food crops, plantations, forestry, livestock and fisheries. The work is considered poorly paid, dirty and monotonous (Rye, 2006; Pratley, 2008; Thissen et al., 2010). However, information technology developments, the emerging software and the platform economy, technological advances and the emergence of the Y generation (millennial, technology literate, innovative and visionary) provide opportunities for the transformation of the agricultural sector. This is beginning with the emergence of a number of product-based start-ups and agricultural products, such as Angon.id and Eragano (financial technology to access development capital), BlumbangReksa (pond water quality control platform), Ci-Agriculture (weather analysis platform, soil sensor and satellite imaging) and eFishery (automatic fish feeder) (Pham and Stack, 2018).

The start-up businesses provide farmers access to new services and products and attract a new workforce, especially the Y generation (even the X generation, who also have information technology literacy, and the next generations, namely Z and Alpha) (Milone and Ventura, 2019). Start-up businesses must also

be directed at creating quality, quantity and sustainable products. However, start-ups must have the support of various parties so as to realise a sustainable rural workforce, through the fulfilment of the need for a scheme of human resources development in the agricultural sector, social partnerships and innovation and technology (Rotz et al., 2019). The development of a sustainable rural workforce requires an interlinked system, considering that the challenges and demands of this sector are increasing with the threat of climate change, increasing food prices, water management, biosecurity, productivity and high competitiveness (Baumann et al., 2008; Pratley, 2008; Goyal et al., 2017).

Rural migration and pluriactivity

Internal and international migration is an opportunity as well as a threat to regional economies. Migration is an opportunity to contribute to development in the destination area, but it would also be a threat if there was no integration between migrants and local residents, which, in turn, would disrupt social cohesion and potentially lead to conflict. In Indonesia's agriculture sector, migrant risks occur concerning regional movement as well as the type of work. Migration is closely related to pluriactivity: that is, looking for sources of family income outside the agricultural sector and the region, both as part-time jobs and as a form of business diversification (Anjos and Caldas, 2007; Loughrey et al., 2013). This phenomenon is often found among low-income farmers attempting to find additional income (Anjos and Caldas, 2007). Examples of farmer diversification in Indonesia include rice milling, livestock management and commodity trading.

Analysis of worker mobility (BPS, 2016) reveals that there has been increased migration in a number of urban areas in Indonesia, especially into the cities in West Java, Central Java and DKI Jakarta, where the characteristic incoming migrants are males (70%) between 20 and 39 years old (60.8%), and the work target sectors are trade, restaurants and accommodation services (29.8%) and social and individual services (21.1%). In contrast, the level of open unemployment in rural areas increased from 3.72% in 2017 to 4.04% in 2018 (BPS, 2018). There is a population flow out of rural areas to large cities; at the same time, farmers are forced to seek second jobs, and the unemployment numbers have slightly increased. The absence of attractive employment opportunities in the agricultural sector and in rural areas drives a brain drain (mobilisation of productive and educated workers from rural areas to cities) (Pratley, 2008; Wiratri et al., 2017). Similar shifts in the rural/urban population and labour force occur in developing countries and developed countries, such as in Australia (Pratley, 2008; Li et al., 2014), Romania (Iorga, 2017) and Canada (Baumann et al., 2008) in the health sector and in the US for the agricultural sector (Gibbs et al., 2005; Thiede et al., 2016), which has difficulty getting reliable, skilled and hard-working labour (Pratley, 2008). Policy makers need to set an agenda to increase the mobility retention of skilled workers and provide employment opportunities in rural regions.

Workforce development schemes

Workforce development programs are an effort to meet the needs of the workforce through changes in attitudes, culture and individual work capacity that are directed towards meeting current business needs and influencing future employment. Workforce development is not limited to value and capacity development, but also includes the sufficiency of workforce numbers. It is essential to maintain workforce retention with adequate workforce development. In contrast to short-term work training and urgent needs, workforce development involves long-term planning and the development of soft skills (Jacobs and Hawley, 2009).

Knowledge is also an important key to rural workforce sustainability, especially in increasing productivity and competitiveness, along with an increase in food prices. The agricultural sector is considered to have an innovation shortage with the threat of climate change; thus there is an increase in demand for farmers' competences and professionalism (Baumann et al., 2008). Education in rural regions is related to skills development and technical knowledge generation (Rivera and Gary, 2008).

In order to support rural areas and agriculture, the policy of the Indian government can be used as a reference. The Indian government aims to double farmer income by 2022 through increasing farmer productivity. Efforts made include improving the quality of the supply chain; developing a social partnership, especially between farmers, governments, companies and buyers; developing digital analytics and business and providing funding and insurance (Goyal et al., 2017)

Young persons have no desire to be farmers (Poole et al., 2013; IFAD, 2011). In addition, the public's interest in learning agriculture through formal education tends to be limited (Poole et al., 2013). The emergence and increasing number of start-ups in the agricultural sector have been able to change the community's mind-set, especially that of young people, from thinking of agriculture as a sector that is not attractive and left behind to considering it a sector that has opportunities for innovation and harnessing information and communication technology (ICT).

Workers in the agricultural sector can be grouped into pre-employment workers (students), farmers, institutionally supported personnel and people transitioning to re-employment; each group requires different knowledge, approaches and training (Rivera and Gary, 2008):

- 1 Pre-employment workers (those in education) require a formal education that has an agricultural component.
- 2 Farmers need assistance and training, market development and information and communication technology to upgrade their skills.
- 3 Institutionally supported personnel (job seekers) need training, counselling, agricultural in-service training, distance learning and certification.
- 4 People transitioning from agriculture (and elsewhere) to re-employment require vocational education, further study, distance learning and certification.

Through formal education, almost every high-ranked university in Indonesia offers agricultural education programs, such as Bogor Agricultural Institute, Bandung Institute of Technology, Gadjah Mada University, the University of Indonesia, Diponegoro University and Airlangga University. However, the programs attract low enrolments and are not seen as a means to a career. The government needs to improve the promotion of agriculture as a career in order to eliminate the negative perception of the sector, which is less attractive in terms of compensation and career paths (Rivera and Gary, 2008). The curriculum needs to offer knowledge that provides solutions to the real problems of farmers and the development of agricultural technology and products. Education programs are usually limited to conventional agriculture and agribusiness and do not include information technology, artificial intelligence marketing and business.

Through non-formal education and rural extension, services for farmers and regions need to access knowledge-transfer services (Rivera and Gary, 2008). This non-formal education mechanism has been carried out in Indonesia through the implementing Agency for Agricultural, Fisheries and Forest Counselling Education (Jacobs and Hawley, 2009). Some of the activities carried out include developing competencies and partnerships, synergising agricultural institutional functions and improving soft skills. Extension activities include technical meetings, field meetings, leadership and entrepreneurship training and the development of agribusiness business models. However, updating and restructuring of agricultural extension services is required to meet new challenges and opportunities, including drought mitigation; climate change; water use; animal care; and business, marketing and IT competencies (Pratley, 2008). Online lectures or webinars for delivery have the potential to reach a wider audience.

Infrastructure and facilities are important in workforce development because, in the era of the internet and technology, the government has developed an online-based sharing application as a medium to address farmers' questions to government agencies. Questions linked to agricultural drainage, pest attacks, water management, bio-hazards, fertilisers, crop selection, animal husbandry and marketing can be handled through online portals. However, without adequate access to information, communication and technology (ICT) infrastructure; without training in the use of ICT; and without software access, the potential for communications, information sharing and skill development is limited.

Social partnerships

Partnerships are an important means of improving innovation in the agricultural sector by emphasising the objectives, governance and composition of partnerships. A partnership can take the form of social learning, case study, research, funding, innovation and technology adoption, access to knowledge and market and publicity (Hermans et al., 2019). Social partners can include farmers, industry, professions, public authorities, local communities, NGOs and education institutions. Through partnerships, local social capital can be extended and improved.

A polycentric policy is needed, especially in the era of regional autonomy in Indonesia, because each authority has a local development plan for each region. Each region needs to have a blueprint and milestones in the development of the agricultural sector and other related industries. Government participation is also needed to create consensus and innovation spaces. Consensus space is a mechanism for sharing ideas, supporting each other and promoting products. Likewise, innovation spaces, such as incubators, technology transfers and research and development centers need to be developed by the government (Prabawani et al., 2017). With the government's active role, it is expected that there will be professional societies funding and leading the research that develops the agricultural sector. Partnerships can address the five main problems faced by farmers in Indonesia; land tenure; distribution barriers that limit the availability of fertilisers, seeds and pesticides; funding access that causes dependence on money lenders; weakness in the bargaining power of farmers' associations; and low levels of education and training (Dao, 2009).

The government, through the Public Service Agency, can provide credit for agricultural equipment and machinery with the aim of modernising and increasing productivity. There is a special financing scheme for the Combined Farmers Group to promote farmer participation.

Informal networks are needed because land management is related to communities and local authorities with central authorities (Koopmans et al., 2018). Cooperation is needed in the agricultural sector, primarily to strengthen the bargaining position of farmers with their business partners. In conditions of high dependence on middlemen (Tambunan, 2005; Cahaya, 2015), farmers need to have joint power. This power will encourage more profitable pricing for the farmers, not the traders or middlemen. Collaboration between farmers in the form of farmer groups is also needed to get adequate assistance and coaching facilities from the government. This is important because some government assistance is intended for farmer groups, not individual farmers.

Programs that have benefitted and advantaged farmer groups in Indonesia are cooperation in the planting process, called collective farming; savings and loans for members with funds sourced from the government budget; and collective selling and buying, intended to eliminate middleman roles. In addition, farmer groups also have communal storage; thus, agricultural products can be handled better in order to maintain their quality and provide equipment rentals and pest eradication service (Indrawati, 2014).

There are a number of national and international non-governmental organisations (NGOs) in Indonesia that have concerns about farmers, the agricultural sector and related issues. These include the Center for Indonesian Policy Studies, which highlights the low interest of the young generation in farming; Rikolto from Belgium, which seeks to connect farmers with food industry innovators in Africa, Asia, Europe and Latin America; and Farmers' Centers, which have a focus on reorienting agriculture for sustainable development. In general, NGOs work by assisting farmers or farmer groups, criticising government policies for the benefit of farmers and providing marketing access and funding for farmers. The

NGOs in Indonesia have been effective in assisting farmers and related sectors in nature conservation (Atmodjo et al., 2017; Hadi, 2018) and encouraging the private sector to develop CSR-based programs (Simon and Frederik, 2009), so farmers have better knowledge and development access.

There are at least 25 state-owned enterprises (SOEs) in the agricultural sector in Indonesia. For example, Perum Kehutanan Negara (Forestry Corporation), Perum Perindo (Indonesian Fisheries Corporation), Perikanan Nusantara (Fishery Corporation), Pertani (Agriculture Corporation) and Perkebunan and Nusantara (Plantation Corporation). In addition, there are others SOE in other sectors, such as Bank Mandiri, Pupuk Indonesia, BNI, BRI and BTN, that participate in developing the agricultural sector by providing coffee-processing machines, corn shellers and rice milling units, as well as providing credit and establishing BumDes (corporations at the village level). However, SOE contributions cannot be specifically identified because the facilitation and guidance of the agricultural sector usually involve various parties at different levels. This means that companies owned by the government partner with farmers to support technology access, improve production techniques and provide access to funds.

Conclusion

Despite population loss to cities and significant efforts to encourage innovation in the agricultural sector through field counseling and extension officers, Indonesia still needs to develop skills, improve education and offer technical and professional services to agriculture. The existence of education extension services in the agricultural sector is important towards modernising agriculture. Emerging partnerships offer the potential to access finance and skills that were previously lacking. There remain challenges such as poor infrastructure, low levels of skills and education and the ongoing loss of young talent to urban areas. Developing services and skills is necessary for rural sustainability, but so is providing employment to retain skilled workers and professionals. The government and the partners need to develop agro-based start-up businesses so young generations are interested in pursuing the agricultural sector as farmers, processors of agricultural products and marketers. BumDes (corporations at the village level) can be catalysts for more professional management of the agricultural sector business to provide higher profit and appeal. The program is essential to change the mindset that the agricultural sector is a marginal business; it can be a prevalent and prosperous business with the involvement of technology and ICT.

References

- Anjos, F. S. dos and Caldas, N. V. (2007) 'Pluriactivity and family farming in Brazil: The case of Rio Grande do Sul', *CEPAL Review*, 93, pp. 149–164.
- Aswadi, K. (2017) 'Agricultural and its contribution to poverty reduction : Evidence from aceh, Indonesia', International Conference on Science Technology and Modern Society, pp. 172–177.

- Atmodjo, E., Lamers, M. and Mol, A. (2017) 'Financing marine conservation tourism: Governing entrance fees in Raja Ampat, Indonesia', *Marine Policy*, 78(January), pp. 181–188. Elsevier Ltd. doi:10.1016/j.marpol.2017.01.023.
- Bahri, S. and Paman, U. (2012) 'The role of oil palm plantation on poverty reduction and household income distribution in riau province', *Dinamika Pertanian*, XXVII(3), pp. 173–179.
- Baumann, A., Hunsberger, M., Blythe, J. and Crea, M. (2008) 'Sustainability of the workforce: Government policies and the rural fit', *Health Policy*, 85(3), pp. 372–379. doi:10.1016/j.healthpol.2007.09.004.
- Belton, B. and Filipski, M. (2019) 'Rural transformation in central Myanmar : By how much, and for whom?' *Journal of Rural Studies*, (February), pp. 1–11. Elsevier. doi:10.1016/j.jrurstud.2019.02.012.
- BPS (2013) *Proyeksi Penduduk Indonesia Indonesia (Projection of Population in Indonesia) 2010–2035*. Jakarta: BPS.
- BPS (2016) *Analisis Mobilitas Tenaga Kerja Hasil Sakernas (Labor Mobility Analysis of National Census) 2016*. Jakarta: BPS.
- BPS (2018) *Hasil Survei Pertanian antar Sensus (SUTAS) (Inter-Census Agriculture Survey Results) 2018*. Jakarta: BPS.
- Cahaya, A. (2015) 'Fishermen community in the coastal area: A note from Indonesian poor family', *Procedia Economics and Finance*, 26(15), pp. 29–33. Elsevier B.V. doi:10.1016/S2212-5671(15)00801-1.
- Chand, R. and Srivastava, S. K. (2014) 'Changes in the rural labour market and their implications for agriculture', *Economic & Political Weekly*, XLIX(10), pp. 47–54.
- Chen, C., Legates, R., Zhao, M. and Fang, C. (2018) 'The changing rural-urban divide in China's megacities', *Cities*, (March), pp. 1–10. Elsevier. doi:10.1016/j.cities.2018.03.017.
- Dao, M. Q. (2009) 'Poverty, income distribution, and agriculture in developing countries', *Journal of Economic Studies*, 36(2), pp. 168–183. doi:10.1108/01443580910955051.
- Gibbs, R., Kusmin, L. and Cromartie, J. (2005) 'Low-skill employment and the changing economy of rural America', *Economic Research Report*, 10, pp. 1–30.
- Goyal, A., Rajagopalan, C., Goedde, L. and Nathani, N. (2017) *Harvesting Golden Opportunities in Indian Agriculture: From Food Security to Farmers' Income Security by 2025*. Kerala, India: McKinsey & Company.
- Guo, G., Wen, Q. and Zhu, J. (2015) 'The impact of aging agricultural labor population on farmland output: From the perspective of farmer preferences', *Mathematical Problems in Engineering*, pp. 1–7.
- Hadi, S. P. (2018) 'Critical review of spatial planning of CAT Watuputih, rembang zone, central java, Indonesia', *E3S Web of Conferences*, The 2nd International Conference on Energy, Environmental and Information System (ICENIS 2017), pp. 2017–2019.
- Hermans, F., Geerling-eiff, F., Potters, J. and Klerkx, L. (2019) 'Public-private partnerships as systemic agricultural innovation policy instruments—assessing their contribution to innovation system function dynamics', *NJAS – Wageningen Journal of Life Sciences*, 88(October 2018), pp. 76–95. Elsevier. doi:10.1016/j.njas.2018.10.001.
- IFAD (2011) 'Feeding future generations: Young rural people today – prosperous, productive farmers tomorrow', Proceedings of the Governing Council High-Level

- Panel and Side Events: In Conjunction with the Thirty-Fourth Session of IFAD's Governing Council, February, p. 43.
- ILO (2019) *World Employment Social Outlook Trends 2019*. Geneva: ILO.
- Indonesia-Investments (2018) *Gross Domestic Product of Indonesia*. Statistics.
- Indrawati, N. N. (2014) 'Fungsi Gabungan Kelompok Tani (Gapoktan) Bagi Petani Desa Pojokkulon Kecamatan Kesamben Kabupaten Jombang (The Function of Farmer Groups (Gapoktan) for Farmers in Pojokkulon Village, Kesamben District, Jombang Regency)', *Journal Universitas Airlangga*, 2, pp. 335–348.
- Iorga, A. M. (2017) 'Characteristics workforce of the Romanian', *Scientific Papers Series Management, Economic Engineering in Agriculture and Rural Development*, 17(2), pp. 183–186.
- Jacobs, R. L. and Hawley, J. D. (2009) 'The emergence of "workforce development": Definition, conceptual boundaries and implications', *International Handbook of Education for the Changing World of Work*, pp. 2537–2538. doi:10.1007/978-1-4020-5281-1.
- Koopmans, M. E., Rogge, E., Mettepenningen, E., Knickel, K. and Šūmane, S. (2018) 'The role of multi-actor governance in aligning farm modernization and sustainable rural development', *Journal of Rural Studies*, 59, pp. 252–262. doi:10.1016/j.jrurstud.2017.03.012.
- Lí, J., Scott, A., McGrail, M., Humphreys, J. and Witt, J. (2014) 'Retaining rural doctors: Doctors' preferences for rural medical workforce incentives', *Social Science and Medicine*, 121(1), pp. 56–64. doi:10.1016/j.socscimed.2014.09.053.
- Loughrey, J., Donnellan, T., Hennessy, T. and Hanrahan, K. (2013) *The Role of Pluri-activity in Farm Exit and Labour Supply Decisions*. Factor Markets Working Document No. 67, August.
- Milone, P. and Ventura, F. (2019) 'New generation farmers: Rediscovering the peasantry', *Journal of Rural Studies*, 65(May 2018), pp. 43–52. doi:10.1016/j.jrurstud.2018.12.009.
- Pham, X. and Stack, M. (2018) 'How data analytics is transforming agriculture', *Business Horizons*, 61(1), pp. 125–133. Kelley School of Business, Indiana University. doi:10.1016/j.bushor.2017.09.011.
- Poole, N., Álvarez, F., Penagos, N. and Vázquez, R. (2013) 'Education for all and for what? Life-skills and livelihoods in rural communities', *Journal of Agribusiness in Developing and Emerging Economies*, 3(1), pp. 64–78. doi:10.1108/20440831311321656.
- Prabawani, B., Prihatini, A. E. and Purbawati, D. (2019). 'Economic rationalities of Loksado Indigeneous in a redenomination perspective', *Jurnal ILMU Sosial*, 18(1), pp. 1–16.
- Prabawani, B., Saryadi, W. and Hidayat, W. (2017) 'Knowledge hubs for empowering Indonesian SMEs and the sustainability', *Advanced Science Letters*, 23(1), pp. 448–452. doi:10.1166/asl.2017.7219.
- Pratley, J. (2008) 'Workforce planning in agriculture : Agricultural education and capacity building at the crossroads', *Farm Policy Journal*, 5(3), pp. 27–41.
- Rivera, W. M. and Gary, A. E. (2008) 'Human resource development for modernizing the agricultural workforce', *Human Resource Development Review*, 7(4), pp. 374–386. doi:10.1177/1534484308324633.
- Rotz, S., Gravely, E., Mosby, I., Duncan, E., Finnis, E., Horgan, M. . . and Fraser, E. (2019) 'Automated pastures and the digital divide: How agricultural technologies

- are shaping labour and rural communities’, *Journal of Rural Studies*, (January), pp. 1–11. Elsevier. doi:10.1016/j.jrurstud.2019.01.023.
- Rye, J. F. (2006) ‘Rural youths’ images of the rural’, *Journal of Rural Studies*, 22(4), pp. 409–421. doi:10.1016/j.jrurstud.2006.01.005.
- Simon, H. and Frederik, L. (2009) *CSR in Indonesia: A Qualitative Study from a Managerial Perspective Regarding Views and Other Important Aspects of CSR in Indonesia*, Thesis, Gotland University.
- Sugiartawan, P., Ramantha, I. W. and Susrusa, K. B. (2013) ‘Portfolio analysis of agribusiness firm in the Indonesian stock exchange’, *Jurnal Manajemen Agribisnis*, 1(1).
- Susilowati, S. H. (2014) ‘Attracting the young generation to engage in agriculture’, FFTC-RDA International Seminar on Enhanced Entry of Young Generation into Farming. Jeonju, Korea, pp. 107–123.
- Tambunan, T. (2005) ‘Promoting small and medium enterprises with a clustering approach: A policy experience’, *Journal of Small Business Management*, 43(2), pp. 138–154.
- Thiede, B. C., Lichter, D. T. and Slack, T. (2016) ‘Working, but poor : The good life in rural America?’ *Journal of Rural Studies*, pp. 1–11. Elsevier. doi:10.1016/j.jrurstud.2016.02.007.
- Thissen, F., Fortuijn, J. D., Strijker, D. and Haartsen, T. (2010) ‘Migration intentions of rural youth in the Westhoek, Flanders, Belgium and the Veenkoloniën, The Netherlands’, *Journal of Rural Studies*, 26(4), pp. 428–436. Elsevier. doi:10.1016/j.jrurstud.2010.05.001.
- Thurlow, J., Dorosh, P. and Davis, B. (2019) ‘Demographic change, agriculture, and rural poverty’, *Sustainable Food and Agriculture*, pp. 31–54. Elsevier. doi:10.1016/B978-0-12-812134-4.00003-0.
- Trading Economics (2019) *Indonesia GDP From Agriculture*, Summary.
- Wiratri, A., Harfina, D., Aji, G. B., Prasetyoputra, P. and Ningrum, V. (2017) *Pemuda & Pertanian Berkelanjutan: Dependensi, Strategi, dan Otonomi (Youth & Sustainable Agriculture: Dependency, Strategy, and Autonomy)*. Jakarta: Pustaka Sinar Harapan.