6 Understanding agri-food systems as assemblages

Worlds of rice in Indonesia

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Introduction

Agri-food 'systems' are exemplary of multiple realities, from that of traditional to modern, to alternative, among which contestation often occurs in a fight for political power. In a political economy narrative – mobilized by right- or left-leaning scholars – the credit (or blame) is by and large put on humans and institutions as the sole source of agency. These points of view, however, fail to address the complexity of human–nature relationships and often end up with monolithic frameworks and outcomes framed by essentialist categories that obscure as much as they reveal. As an alternative, we will elaborate on previous arguments regarding agency as a force distributed across multiple entities, both human and non-human (Dwiartama and Rosin 2014), informed by a vibrant materialist approach (Bennett 2007). In this work, we reveal the extent to which characteristics of a non-human actor (in this sense, a crop) shape the way agricultural practices and policies can be enacted. To do this, we engage with Mol's (2002) concept of multiplicity to suggest that the political objective of a vibrant materialist approach in agri-food studies is to nurture a diversity of actions and practices shaped by the nature of non-human actors, and their alignment with the rest of the actors within an assemblage.

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In order to elucidate this argument, this chapter discusses the worlds of rice, a commodity that lies at the heart of Indonesia's agriculture and food systems. Different from the people of many other countries outside South-East Asia, in which rice is merely an alternative to other sources of carbohydrate (such as maize, wheat and potato), for South-East Asians, and Indonesians in particular, rice has long been a part of their culture, the symbol of prosperity, and is used in many ways to exercise power. In Indonesia, public officials, politicians and governors all brandish rice as a political weapon, often symbolically harvesting rice to demonstrate their full commitment to the well-being of society. It thus has a long history, being central to Indonesian politics and society since before the era of the longest-ruling president, Soeharto, until the current president, Joko Widodo. But how has rice become such a powerful crop to the majority of Indonesians, and how are its many powers to be understood?

In answering this question, we refer initially to C. Peter Timmer (2005: 14), one of the most influential political economists studying Indonesia,

who stated that 'rice is different, and the difference has powerfully influenced economics and politics throughout much of Asia'. The difference, he argued, lies in the multiplicity of rice: as a staple food, a crop and a commodity. As a food, rice supplies 35–67 per cent of the total calorie intake of the population, and its consumption has been increasing over the last four decades (Gerard et al. 2001; BPS 2012). As a crop, it is the source of income for more than 100 million farmers, farmworkers and retailers in Indonesia, and accounted for an area in 2009 of 12 million hectares, and a total production of up to 64 million tons (BPS 2012). In commodity terms, Indonesia has become both the third largest producer of rice and, at the same time, one of the largest importers of rice in the world (Hill 2000; Dawe 2002; FAO 2011). Therefore, rice price fluctuations have a serious impact on the livelihood of the majority of farmers and urban poor in Indonesia, causing the government to buffer its citizens from the fluctuating world price (Dawe 2001; Timmer 2005). It is, thus, not surprising that rice has become so pivotal to the politics of Indonesia's agri-food worlds.

What comes as a surprise is that there has been no single policy able to be applied effectively to Indonesia's rice agriculture. It is, evidently, an unruly and ungovernable crop. The history of Indonesia's rice agricultural development has been coloured with controversies and political turmoil surrounding what does and does not need to be done with rice production (Hill 2000). First, we will show how the current understanding of rice production has been focused too much on achieving a structured, singular and coordinated policy, which in the end results in political deadlock and inefficiency. This approach has overlooked the multiple realities and practices of rice agriculture, which implies the need for entirely different policy approaches.

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Second, we attempt to look beyond the current understanding of political economy so as to see things differently. This is raised through the next question: how might a post-human political economy contribute to the practical understanding of agri-food systems? We employ what Mol (2002) terms 'multiplicity' in respect of rice: to see rice being enacted not only as an economic commodity but also as a political instrument and cultural artefact,[1] which intricately shapes different 'worlds of rice'.

A political history of rice in Indonesia

The history of rice in Indonesia has been characterized by the interplay of political power, even before the rise of its nation-state. Reid (1999), for instance, documented that, between the ninth and tenth centuries in ancient Java, rice became not only a major subsistence crop for the society but also a market commodity, and the basis of agricultural tax systems in several small kingdoms in the region. During Dutch colonialism, the Dutch East Indies had become one of the centres of production of tropical commodities among others – for example sugar, coffee and copra – and peasants were forced to plant those crops in combination, or rotation, with rice (Husken and

White 1989). This, as it turned out, helped to shape how rice farming was practised, demonstrating a shift from subsistence to semi-intensive and finally industrialized agriculture.

After its independence in 1945, and following a series of political crises over the next two decades, Indonesia, with the help of the Food and Agriculture Organization, entered the era of the Green Revolution, in which it restructured its rice agriculture through the introduction of high-yielding rice varieties (HYVs), subsidization of agricultural inputs and credit, and stabilization of farm-gate prices (Gerard et al. 2001). With these strategies, rice agriculture in Indonesia showed consistent increases in yields in the early 1980s, although only to be followed, within a decade, by a rapid decline in production. After 1990, Indonesia's economic growth began to stagnate and its resources were depleted, owing to an over-subsidized agriculture sector and a highly corrupt government (Gerard et al. 2001; Sumarto and Suryahadi 2007), reaching its worst point during the Asian Financial Crisis in 1997. This economic crisis was relieved by the International Monetary Fund (IMF)'s financial assistance; but it came at a large cost. Indonesia was forced to rescind all tariff and non-tariff barriers, as well as direct subsidies of its agricultural commodities.

More than 17 years have passed, and yet Indonesia's agricultural policies and strategies still show a lot of inconsistencies. For example, Indonesia liberalized its agriculture as a loan requirement made by the IMF (Gerard et al. 2001), but a few years later increased import tariffs and banned imported rice during harvest periods (Fane and Warr 2009). The government also experimented with contradictory agricultural policies, such as organic/hybrid rice (Dwiartama 2014) and food sovereignty/industrial food estates (Neilson and Arifin 2012). A critical political economy analysis, such as that set out by Neilson and Arifin (2012), might address the current state of inconsistencies as stemming from many familiar categories – political strategies and corruption among elites (and a role for peasants), which undermine food security, amidst the wider global economic and political shocks – and this kind of critique would almost certainly end with a prescription to rearrange elites, peasants and food system governance towards the most economically and politically effective policy approach to ensure food security and sustainable livelihoods. In this chapter, we laud these ends, but offer a different argument as to how we might get there.

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A look beyond political economy

The ongoing, and sometimes harsh, political contests that drive towards hegemony of an agricultural paradigm (traditionalism, industrialism or an alternative) seem to show that the government has failed to acknowledge the multiple realities of rice agri-food systems in Indonesia. To date, traditional rice production is still operated by many local communities in rural areas for subsistence purposes. After the Green Revolution, industrialized agriculture grew significantly,

engulfing the smaller and marginalized traditional farmers, although not entirely eliminating them. Along with the growth of agro-industry, there is also the growth of organic and alternative rice farming systems, which meet consumer demand from middle- to upper-class society in urban areas. These different agricultural systems extend beyond the farm level along the agri-food chain and, in the end, significantly influence how rice agricultural policies are being enacted in different worlds of rice.

We understand this from the realization that there are multiple meanings attached to rice, acquired through the assemblages formed with other actors, as shown in Figure 6.1. This figure does a particular kind of ontological work by avoiding the normal categories that are used to describe industries, sectors or economies. It does this by demonstrating the lines, relationships and assembling that 'make' the worlds of rice. Community groups attach themselves to particular rice varieties owing to cultural and dietary preferences, and thus bring meaning to rice as a cultural artefact. Pests, diseases, climate, water and soil all influence farmers and research centres when they are determining which rice should be planted in a particular area. Consumers, traders and technology negotiate the tastes, qualities and quantities of rice being produced. The government and political parties negotiate with rice as a commodity, establishing rice in a different role: rice as a political tool, influencing the many networks of Indonesian society. Assembling this alternative narrative, and building on Timmer's (2005) assertion of the three facets of rice (a food, a crop and a commodity), demands that we interrogate a new set of theoretical frameworks in ways that can take account of the multiplicity of rice revealed in Figure 6.1.

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Rice in its multiplicity

Many authors who study rice start their introduction with an expression of amazement at the adaptability of rice (for example see Hanks 1972; Bray 1986). Rice grows in a very wide spectrum of conditions. Although it is known mainly as a semi-aquatic plant that thrives in swampy areas, it can also grow in dry areas (Lu and Chang 1980; Bray 1986). In fact, certain varieties of rice are not only tolerant to water, but also benefit from flooded conditions. Mikkelsen and de Datta (1980) note that precipitation and water enhance nutrient availability, help with nitrogen fixation, and create favourable microclimatic conditions for rice growth. Some varieties have also adapted to the extent that the water level flooding the stem of rice acts as an indicator for the initiation and ripening of its fruits (Vergara 1980).

Domesticated by the early Asian settlers in about 10000–15000 BC, the annual forms of rice are thought to originate from East India, South-East Asia and South-West China (Lu and Chang 1980; Bray 1986). It is estimated that, 10,000 years later, rice had successfully replaced root crops and other cereals as the staple food of people living in Asia. In its places of origin, rice formed three eco-geographic variety groups based on their affinities to specific ecological

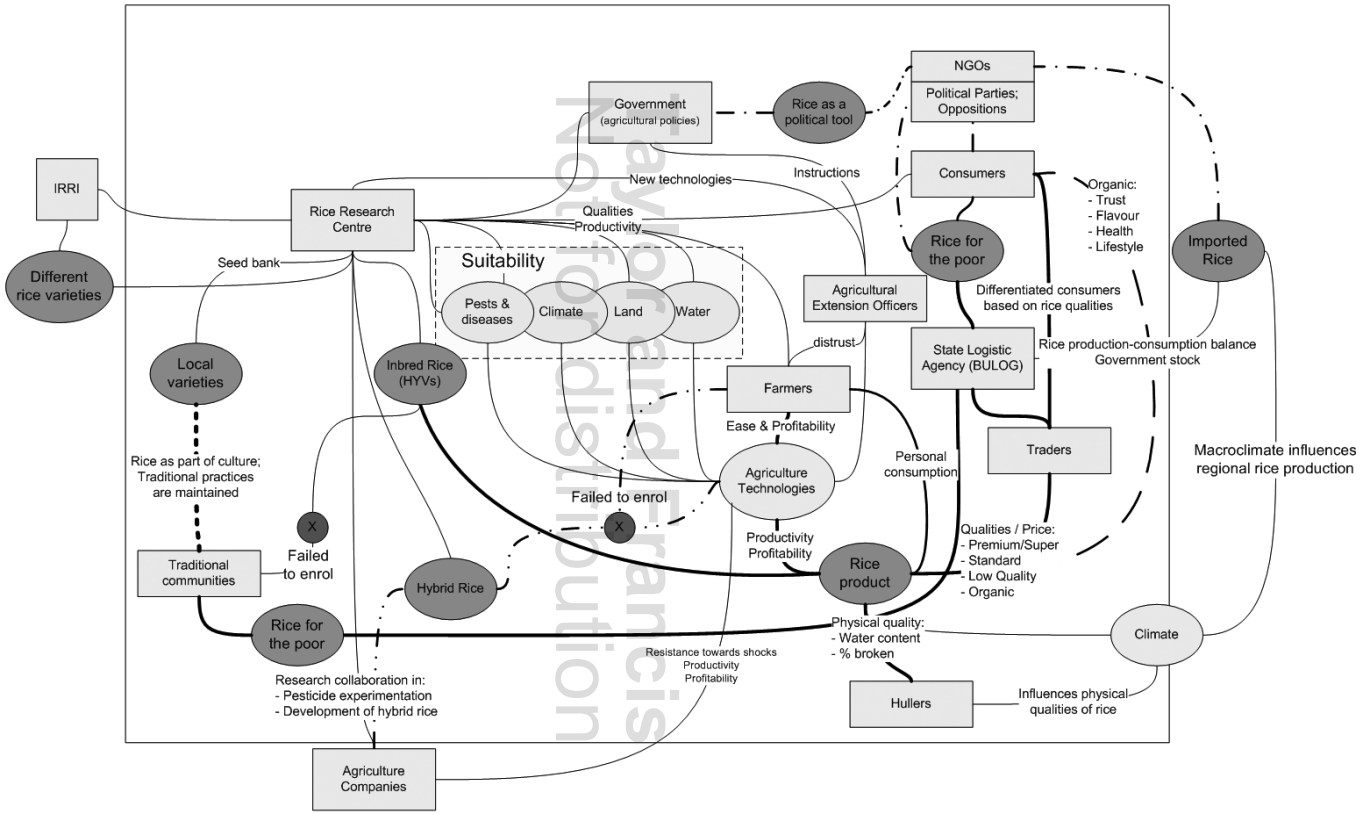

Figure 6.1 Assemblages and multiplicity of rice in Indonesia.

and geographic characteristics. The first was the *sinica* (*japonica*) subspecies, its name reflecting its origin in temperate Asia (China and Japan). The second was *indica*, including the tropical rice varieties from India and the South-East Asian region (Hanks 1972; Lu and Chang 1980). The third subspecies had only been identified in 1958 as *javanica* to designate a similar variety group to *japonica*, but with significant differences in its affinity to a tropical environment (Bray 1986).

At this point, it is necessary to detail the characteristics of two relevant subspecies of rice in Indonesia, the *javanica* and *indica*, as these are vital for our subsequent analysis of the agency of rice that contributes to its multiplicity. The *javanica* subspecies, commonly known as the traditional variety group (TV), has broad, thick-culmed grains, low tillering, tall plant stature, low grain-shattering, and hard plant tissue (Bray 1986). It is somewhat less sensitive to sunlight and temperature, and thus has a good reputation for its ability to grow on dry upland areas of swidden agriculture (Asai et al. 2009).

The *indica* subspecies, from which the modern high-yielding rice varieties (HYVs) are derived, has longer grains, profuse tillering, low to intermediate plant stature, easy grain-shattering, and a soft plant tissue. It is more responsive to temperature and often found in lower altitudes. These characteristics made *indica* rice the perfect candidate for the Green Revolution in lowland tropical areas in Indonesia, which cover a very wide area with good irrigation systems and very fertile, alluvial soil. The profuse tillering means that it has more capacity to capture sunlight for grain production; the easy shattering means it is more energy efficient when separating the grain from the straw; the long and thinly culmed grain makes it easier to hull. It is apparent that these characteristics have shaped the way in which modern agriculture is practised in Indonesia, rather than it being a mere coincidence that the technology fits with the characteristics of *indica*. The following is an elaboration of how the two subspecies shape different worlds of rice in Indonesia.

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Rice as an economic commodity

From the early 1950s, the Malthusian dilemma had oriented agriculture and food research and development to align with the productivity rhetoric and goals of the Green Revolution. The main objective of such research was to produce food commodities with higher yields and shorter growing periods. For rice, the perfect candidate was *indica*, as the once local varieties had already spread across tropical Asia (including Sri Lanka, Taiwan, Malaysia and Indonesia) (Herdt and Capule 1983). Simultaneously, many national-based research institutes in the region were developing new rice varieties; hence, the *indica* variety group provided a plethora of genetic resources for the development of HYVs.

Through *indica* rice, the HYVs introduced a new spirit of agriculture under the Green Revolution and re-oriented rice farming towards a more industrialized agriculture, directly connected to the domestic, and also international,

rice markets (Dawe 2001). This has brought various shocks and changes to the system. Pests and diseases emerge in various forms. Climatic change, in combination with global economic crisis, exacerbates crisis conditions (Neilson and Arifin 2012). In response to these shocks, within the last 50 years the Indonesian Centre for Rice Research (ICRR) has developed more than 200 new varieties of *indica* rice from local and regional seed banks on the basis of their resistance to pests and diseases, their suitability to extreme environments (flood, drought, saline tolerance), their productivity, and taste preferences. The first three characteristics help farmers to better adapt to climate variability than the extent to which farmers traditionally had done so. This last characteristic, furthermore, is particularly useful for creating a variety of products within the rice market and, to some extent, a flexible and diverse economy for farmers.

The majority of farmers grow 'regular' varieties to produce a household-consumption standard of rice grain (although variation in quality exists owing to the different environmental conditions in which rice is grown). Others use varieties that are less desirable for household consumption, such as IR42 and glutinous rice, which, as raw materials in the food processing industry, have higher prices in the market. In the southern region of West Java, most of the farmers own very small plots of land, decreasing the commercial feasibility of their agricultural activities. Because of limited land and low soil quality that results in lower productivity, those who farm commercially often choose to plant premium varieties, which taste better and consumers prefer, such as the aromatic *pandanwangi* rice.

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This variability also impacts on the dynamics of the rice market. The premium rice such as *pandanwangi* is limited in availability, resulting in a price that is more than 50 per cent higher than that of the regular rice in the same market. It follows that the premium rice only serves a particular market segment of upper-class consumers. Meanwhile, the regular rice constitutes more than 90 per cent of all traded rice. Therefore, the regular rice acts to shape the overall price in the market.

Interestingly, because the quality distinction is evident in rice only once it is cooked, there are no clear boundaries for the identity of rice in the market. Rice grains bear certain physical qualities (for example colour, moisture and size) that are often indistinguishable from the point of view of the typical consumer, which, however, result in very different cooking qualities (taste, texture, stickiness and so on). Different combinations of various types of rice cooked in the same pot may result in different cooking quality. In the market, retailers often mix multiple varieties of rice grains in countless combinations to formulate, in a way, new brands of rice. Between the regular and the premium rice, combinations of both in various proportions act as the intermediate qualities bridging the price points of both rice types. This creates a continuum of rice qualities and prices, and consequently also stabilizes prices.

Consumers do not necessarily select for the 'better' rice, and so we may see the qualities of rice as preferences instead of ranks. Based on a survey

by Damardjati and Oka (1992), consumers in Java preferred traditional rice varieties over the modern ones, and the price premium for the traditional far exceeded the price of the 'better-tasting' modern varieties. This is because the traditional rice varieties provide a different taste and texture (particularly as a result of their high fibre content) from those that the modern varieties have to offer. Labourers commonly also paid less attention to taste, but more to rice varieties that could give 'an enhanced feeling of satiation' (Damardjati and Oka 1992: 60). These multiple dimensions of rice cooking and taste qualities illustrate the necessity of using an economic framework that accounts for much more than just the observable market of standardized rice varieties and the logic of supply and demand.

Rice as a political commodity

The intricacies of the engagement between rice and people, whether they be farmers, traders or consumers, show the importance of rice to the whole of Indonesian society. This fact supports the belief that social and political stability could not have been achieved without stability in the rice agricultural sector (Dawe 2001; Timmer 2005). The extent to which rice has become so important to both farmers and consumers has given rice another meaning: that is, as a lucrative political commodity for the government and political elites.

As a political commodity, rice is recognized as having been a key foundation of social and political stability during the 32 years of Soeharto's authoritarian regime (1966–98). Similarly, the realization of self-sufficiency in Indonesia that coincided with the 2008 World Food Crisis (Neilson and Arifin 2012), as well as some formative regulatory moves (Fane and Warr 2009), might be considered as much a political success as a significant agricultural achievement. It is evident from this study's observations that rice is embodied within political activities in Indonesia to a greater extent than any other commodity. The material and symbolic embodiment of rice, as a native plant of South-East Asia, staple food for the population, and commodity for the farmers, is evidenced in its strong attachment to, and influence upon, the region's geopolitics.

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Rice as a political commodity serves as a means to cater to the needs not only of farmers and the agricultural sector, but also of a wider group of people, including the rural and urban poor. This has been achieved through a government project called the Rice for the Poor programme (*Beras untuk Keluarga Miskin*, RASKIN). RASKIN is a targeted subsidy of discounted rice distributed every month to poor families throughout Indonesia. The rice is sold to the beneficiaries for a quarter of the average rice price. As rice purchases account for more than 50 per cent of disposable income amongst the urban poor, affordable rice offers significant relief to such families, and helps in alleviating the impact of economic shocks (Irhamni and Nuryakin 2009; Neilson and Arifin 2012). The RASKIN programme has expanded, not only in urban and suburban areas, but also, and most importantly, in rural areas, in which the

number of poor families is greater and they are known to be net consumers of rice (Irhamni and Nuryakin 2009).

Interestingly, in traditional communities RASKIN is not necessarily seen as the rice for the very poor. It has acquired an entirely different meaning. In traditional communities, which are most often self-sufficient in rice, some people are lured to purchase RASKIN because buying rice means that they do not have to work hard to produce and prepare it, which occupies much of their time and energy. As not many people in the traditional communities have money to purchase the rice, RASKIN rice has instead become a commodity for elites in the community. In a way, consuming RASKIN rice in these traditional communities is seen as a privilege for the affluent, evidence that they can have what the poor cannot.

What interests us in understanding this is that rice, in the form in which it was intended to be, can be translated into an entirely altered meaning, given its attachment to different actors. Rice brings within itself qualities that in the end can be perceived differently by every actor. Here, even RASKIN – a rice that through its quality embodies a symbol for the poor – is translated into an object of affluence and privilege as other actors attach themselves to it.

Rice as a cultural artefact

Rice in traditional communities helps to enact an entirely different world. This is not only the result of the way that traditional communities practise different ways of farming, but also because of the characteristics of traditional rice varieties that have rendered this traditional agriculture relevant to the people. The focus of this section shifts from the *indica* to the *javanica* rice variety group, more commonly known as the 'traditional' varieties. As implied by its name, *javanica* rice was, and in some areas still is, the most acceptable variety of rice in the island of Java. As an integral element of local lifeways, it helps to shape how farming and culture are practised in pockets of local communities in upland areas in Java. The traditional *javanica* rice has been deeply entangled with the life and practices of Javanese people. For centuries, rice has influenced Javanese culture in many ways – through their foods, ceremonies, agricultural practices and philosophies (Soemarwoto 2007).

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The Javanese people recognize Dewi Sri, the rice or prosperity goddess, as of central importance to their agricultural activities (for more details see Wessing 1988). In their culture, Dewi Sri is not an external power regulating the performance of rice in the paddy (as most cultures perceive the influence of their deities). She herself is the rice, or the embodiment of rice. Thus, it is not peculiar that the traditional Javanese farmers treat rice in a very deferential manner, through a set of rituals and taboos surrounding this particular product, even around the ways of cooking and consuming it. For them, rice is irreplaceable; as they say, 'Without rice, we could not live.' The way they engage with rice is shown in their attempt to conserve its landraces.[2]

In one traditional community in West Java, the community leader informed us that they had more than 500 landraces, classified according to their sacredness (*buhun*, ancient; *biasa*, regular), their affinity to water–soil regimes (in wetland or dryland), and the elevation at which they are planted (as also noted in Soemarwoto 2007). The sanctity of rice also influences cultural protocols. For example, *buhun* rice, more so than the regular rice, has to be planted as a prerequisite for farming, using *huma* (the dryland rice farming) and with very stringent rules on the procedures of planting. In that sense, *buhun* rice is maintained as a constant reminder of the community's cultural values.

The people–rice relationships emerge not only through those symbolic interactions, but also through the materiality of rice. The physical features of traditional *javanica* rice – hard stem tissue, a long growing period, and low-shattering grains – have shaped traditional agricultural practices. The first two features impact on the way traditional farmers in South-East Asia use small 'finger knives' to cut the rice stalks off the straw (Hanks 1972). For traditional farmers, rice harvesting is a personal process between farmers and their crops. The 'finger' knife allows them to treat each stalk in a respectful, cautious manner, while, from a practical perspective, also giving them the opportunity to distinguish good rice varieties from bad for the purpose of selecting breeding stock.

Another physical feature of the traditional rice is its low-shattering grain. This characteristic is useful for storage, because farmers store the dried rice in stalk bundles, and an easy-shattering rice variety is impractical for this type of storage method. The stalk bundles are put in a small barn designed specifically for storing rice, which retains a particular temperature and humidity. Storing rice in stalk bundles inside this barn helps to lengthen the shelf-life of the rice for years. In many traditional communities in West Java, for instance, community members also allocate some portions of their harvest to be put into a communal rice barn. In circumstances where rice production is compromised owing to climatic shocks, the community relies on this communal barn, from which anyone can borrow rice at any time, and return it with the same amount he/she has borrowed after the next harvest period. With rice providing the basis of their local knowledge, a strong relationship of rice and people has created a system, or network, adaptive enough to withstand environmental shocks (such as climate change and pest infestation) through practices of maintaining the variability of rice varieties, and making use of the durability of rice for risk-sharing.

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These examples of cultural practices (landrace conservation, traditional rice harvesting, and communal barns) are enacted on the basis of the multiplicity of rice, as a symbol, crop, food and cultural artefact. This assemblage is inextricably woven into centuries of co-assembly between humans and nature. The examples also illustrate the co-production or embedded nature of rice with local communities and how these exist in addition to (and should be equally valued and promoted along with) the forms of economy and production that fall under more orthodox categories of explanation.

Conclusions

To conclude, we would like to make the point that acknowledging the diversity and multiplicity of rice also demands facilitating a diversity of actions. The case presented here has demonstrated that each meaning of rice (economic and political commodity as well as cultural artefact) is manifested in different agri-food assemblages, or worlds, of rice. In regard to these multiple realities, this chapter follows the discussion initiated by Mol (2002) on the multiplicity of a disease. In her account, multiplicity is never simply a matter of recognizing different perspectives. Multiple realities are produced by particular practices that relate to each other and that adhere to distinct assemblages of human and non-human actors. These multiple realities also raise the possibility of conflicting practices that hinder a given political performance. The manner through which multiplicity enhances the agri-food systems depends on how these realities 'dovetail together . . . or include one another in complex ways' (Law 2008: 152).

The argument in this chapter also challenges many economic and political analyses that favour navigating Indonesia away from a rice-centred to a more export-oriented agricultural policy (McCulloch and Timmer 2008). Instead, this chapter has suggested that rice is indeed irreplaceable to Indonesians, as evidenced by the complex interconnectedness of rice and society in multiple practices. The fact that, through its multiple meanings and practices, rice is so deeply embodied and intertwined with Indonesian society implies that separating rice from society is practically impossible, and that all of the actors connected to rice will do whatever it takes for the continuance of rice agri-food systems in Indonesia. There should be no single paradigm for Indonesia's rice agriculture, nor for other agricultural commodities. It has been proven with rice that different policies and strategies cater to the needs of different groups, and are in line with the characteristics of different rice varieties. Without acknowledging that rice is multiple, agricultural policy will always invite tensions and deadlocks located in the realties that have been ignored. In the end, we suggest that the role of a post-human research agenda in political decision making comes as a shift from 'controlling' to 'working with' the non-human actors. Our acknowledgement, as social scientists, of the multiple realities of the materiality with which we engage is a political act that encourages more diverse and aware policy making and an openness to other pathways towards resilience, survival and security.

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Notes

1 In Latourian terms, 'artefact' implies embodied actions and knowledge within a material object (see Latour 2005).

2 We agree with Rini Soemarwoto (2007) in using the term 'landraces' instead of 'varieties' or 'cultivars', as they are identified based on the community's traditional method, and a further analysis might determine that two or more landraces represent a single variety, or vice versa.

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