

House Crow Presence as Unsustainable Urban Indicator?

Kewujudan Gagak Rumah adalah Indikator Bandar Tidak Lestari?

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ABSTRACT

House crows (Corvus splendens), normally known as pest organisms due to their unhygienic and noisy characteristics, are usually found in abundance in urban areas, particularly in areas that are littered with rubbish i.e. areas with poor waste management. They forage for scraps near littered market places and poorly maintained garbage dumps, where food waste is not well managed. These areas provide abundant feeding opportunities for scavenging birds, in particular house crows. In Malaysia, hot spot areas for house crow nesting are in the Klang Valley, namely in Kuala Lumpur, Kajang and Klang which are in the Greater Kuala Lumpur area. The presence of house crows have often been regarded as unsustainable urban indicators, in particular as indicators of unhygienic conditions, which in turn are indicators of poor urban cleanliness and health. This urban issue must be addressed effectively and house crows must be controlled to avoid widespread health problems due to their increasing population. In Malaysia, shooting was the only form of control of these urban pests. However, there is often a lack of precaution taken by the authorities during shooting exercises and high risks occur during and after these events. Proper management of these pest organisms is one of the crucial issues that need to be implemented, perhaps even with stronger legislative measure by the authorities in order to avoid health problems to human and negative impacts on the environment, economy and livestock.

Keywords: Urban indicator; unsustainable; environment; economy

ABSTRAK

Gagak rumah kebiasaannya dikenali sebagai organisma perosak kerana ciri-ciri yang tidak bersih dan bising. Kebiasaannya mereka berada di kawasan bandar terutamanya di kawasan yang dipenuhi dengan sampah. Kumpulan gagak ini akan memburu kawasan berhampiran pasar yang bersepeh dan pembuangan sampah yang tidak diselenggarakan dengan baik serta sisa makanan tidak diuruskan dengan baik. Kawasan-kawasan ini sebenarnya menyediakan makanan yang mampu membuka banyak peluang untuk memerangkap burung. Di Malaysia, kawasan 'hot spot' untuk burung gagak membuat sarang adalah di kawasan Lembah Klang iaitu di Kuala Lumpur, Kajang dan Klang dan kawasan ini berada berhampiran Kuala Lumpur. Dengan wujudnya gagak rumah ini dapat memberi petunjuk bahawa kawasan tersebut merupakan bandar mampan. Namun khususnya ia juga menunjukkan keadaan tersebut tidak bersih maka boleh di gambarkan bandar miskin dari aspek kebersihan dan kesihatan. Isu perbandaran ini perlu ditangani dengan berkesan dan burung gagak perlu dikawal untuk mengekalkan masalah kesihatan yang meluas kerana bilangan penduduk meningkat. Di Malaysia, kaedah menembak merupakan salah satu cara kawalan perosak bandar ini. Walau bagaimanapun, terdapat kekangan dan langkah berjaga-jaga yang diambil oleh pihak berkuasa semasa latihan menembak untuk menjaga risiko yang terjadi sebelum dan selepas tindakan ini di lakukan. Pengurusan yang bijak terhadap organisma perosak ini merupakan isu yang sangat penting perlu dilakukan dan kemungkinan dengan langkah perundangan yang lebih kukuh oleh pihak berkuasa untuk mengawal kesihatan manusia dan kesan negatif kepada alam sekitar, ekonomi dan ternakan.

Kata Kunci: Penunjuk bandar; tidak mampan; alam sekitar; ekonomi

INTRODUCTION

Sustainable development is defined and used internationally as “development that meets the needs of the present without compromising the ability of future generations to meet their own needs” (WCED 1987). Achieving sustainable development

and ensuring environmental sustainability are key goals for the international community, as a means to ensure human well-being. The study on Options on Strategies for Sustainable Regional Development Planning and Development by Universiti Kebangsaan Malaysia (UKM), led by the Institute for Environment and Development (LESTARI)

between 2012-2013 also places human well-being as a major goal of sustainable development and sustainable regional development. This is seen in the definition of sustainable development that was developed by the study team, comprising of multi-sectoral and multi-disciplinary team of experts from UKM. The UKM experts, in 1993, defined sustainable development as development that meets inter-generational needs through effective management and utilization of human and natural resources and better environmental protection for the continuous provision of goods and services, and ensuring social equity and well being. This is supplemented by the definition of socio-economic development, that is socio-economic growth and well-being that fulfils basic inter-generational needs as well as maintain peace, security and harmony with better protection of the environment and more efficient usage of Malaysia's human and natural resources. To achieve the goals that are embedded in the definitions will require the established interrelationship between population, resources, the environment and progress be fully recognised and appropriately managed (Danko & Lourenco 2002).

The focus of this paper is the discussion on house crow (*Corvus splendens*), in particular whether or not its presence should be regarded as an unsustainable urban indicator. In Malaysia, hot spot areas for house crow nesting are in the municipality of Klang, Kuala Lumpur and Kajang, all of which are situated in Greater Kuala Lumpur or the Klang Valley. The presence of house crow in the national capital is a cause for concern as the birds are considered as pests wherever they are present.

The house crow is an invasive bird in many parts of Asia. Invasive birds are defined as non-indigenous species that have spread from the point of introduction and become abundant (Kolar & Lodge 2001). They can have serious impact on the native biodiversity, native ecosystems and humans. In Peninsular Malaysia, house crow was first introduced into Klang town with the intent to control caterpillars in agricultural farms, but they soon took to foraging on refuse in urban areas (Willey 1904; Soh et al. 2002). Within a few decades, they had successfully established an alarming population size in several cities and towns in Malaysia. Therefore it is important to understand their behaviour and growth as well as life pattern, in order to understand the level of them being 'pests' and whether or not they should be considered as an unsustainable urban indicator.

With increasing number of crows in the urban areas, it is increasingly important to understand how urban activities affect ecosystems, with urban habitats becoming increasingly relevant to biodiversity research. Species richness and abundance of exotic and generalist bird species increase with increasing urbanisation, while the reverse is often true for native and specialist birds (MacGregor-Fors & Ortega-Alvarez 2011). Birds' communities are also increasingly dominated by a subset of species with increasing urbanisation.

According to Soh et al. (2002), the house crow has been categorised as pest species in both native and foreign countries. Its diet is omnivorous which includes insects, termites, locusts, grain, nectar, fruit, offal, carrion, eggs and young birds. They may live either as solitary or colonial nesters. There are some common invasive species characteristic like house crow such as facultative colonial nesting, communal roosting and congregation of food resources.

Jones (1996) suggested that successful invasive birds have high reproductive rates and maintain high flock densities. In Peninsular Malaysia, the peak-breeding season of house crows was observed to extend from April to July (Nordin & Yusof 1980). In Singapore, house crows prefer public housing and commercial areas. These show that crows are attracted to these land uses because of the high amount of anthropogenic food that can be found there. There is evidence that the existence of extra food cause increased fecundity and survival in other species of crows (Marzluff & Neatherlin 2006)

The crows' invasions have attracted the attention of wildlife managers because of the bird's well documented negative impact on native wildlife, agricultural crops, and by harbouring of pathogen that cause enteric disorders, even human health (Archer 2001). In Malaysia, studies on house crow reported a distance to roost of 8.5km in Kuala Lumpur (Chia 1976). Studies in Singapore recorded a shorter distance to roost (maximum = 3.5km). Paired adult house crows possess significant smaller activity areas in contrast to birds that do not form pair bonds. This suggests that they either establish themselves in higher quality sites, or that they are more dominant when competing for temporary abundant food within their home ranges. By understanding their movement patterns and habitat preferences, crows' management practices can be more focused and successful.

METHOD FOR SUSTAINABILITY ASSESSMENT

According to Basiago (1999), there is a close link between the key elements of sustainability. The implementation of measures for sustainable social and environmental conditions results in economic sustainability as well. Therefore planning, management and policy-making must be conducted in such a way as to ensure healthy economic growth, citizen satisfaction and adequate maintenance, development and redevelopment of infrastructure (Daniell et al. 2005). Additionally, sustainable development is about achieving social, economic and environmental equilibrium over spatial and dynamic horizons (Hellstrom et al. 2000),

In order to determine whether or not the house crow (*Corvus splendens*) functions as an unsustainable urban indicator, it is necessary to evaluate the sustainability of the urban area before the presence of crows. Assessing sustainability is one of the most crucial steps that should be taken before any sustainability- enhancement planning is carried out. According to Barton's (2004) concerns, sustainability is evaluated via the analysis of a selected group of parameters or indicator, using existing or case-tailored models capable of producing reliable, reproducible and defensible solutions, given a certain set of input data and a series of case specific constraints. To assess whether or not house crow is to be regarded as an unsustainable urban indicator, several items should be put into consideration for the assessment: the species to study, the study areas, historical data sources, sanitary state of urban areas and estimation of food waster production Vuorisalo et al. (2003).

IMPACT OF HOUSE CROW AS A PEST AVIFAUNA

In the cities, bird communities are often highly homogenized, especially in the highly urbanized centers. When widespread, highly mobile species congregate in high densities close to human habitations and may create significant problems such as health risks. Migratory and urban birds for example, were a source of concern for health authorities during the avian flu outbreak in recent years (Sodhi & Sharp 2006).



a)



b)

Pictures of house crow near the feeding ground (a) and a group of crows at the dumpsite

Source: news.bbc.co.uk

The existence of an invasive bird population such as house crow may affect the community of human population living there. The rapid increasing numbers of House crow (*Corvus splendens*) population will be considered as increasing number of problems from various perspectives. According to (Jackson & Cowburn 2011) in Kenya, *Corvus splendens* may cause lots of problems: (a) to human - risk of health, menace to the society, damaging infrastructure; (b) to the economy - damaging agriculture, damaging tourism; and (c) environmental disturbance, even destruction – overpowering indigenous bird populations, disturbance of turtle nesting.

In Singapore, there is much concern on excessive noise from roosts of house crows that also cause annoyance. Meanwhile in Malaysia, the establishment of house crows populations cause several negative impacts as well such as potential crop pest, competing with native species, communal roosts annoy residents and reduction in native biodiversity (Yap & Sodhi 2004). The presence of invasive birds could compound the survival pressures on the avifauna through predation, disturbance or competition for resources.

Diseases that can be passed from animals to humans and vice versa are called zoonotic diseases. According to Jacob et al. (2011) there are several zoonotic diseases that might be transmitted from the avian including house crows, which are; allergic alveolitis, avian influenza, avian tuberculosis, campylobacteriosis, chlamydiosis, cryptosporidiosis, giardia, New Castles disease, salmonellosis and sarcocystis. There are several hemoprotozoa that are normally reviewed among avian, which are *Plasmodium*, *Hemoproteus*, *Leucocytozoon*, *Atoxoplasma*, *Trypanosoma*, *Aegyptianella*, *Babesia* and *Akiba*. The frequent hemoprotozoa that have been found in the blood of house crows are *Aegyptianella*, *Leucocytozoon*, *Proteus* and *Trypanosoma corvi* (Cooper 1996; Rae 1995).

Public perception also exists that the house crow may spread pathogen to humans. The accumulation of their faecal dropping is thus perceived as a health hazard (Peh & Sodhi 2002). Although Cooper (1996) has found no evidence that the house crow plays a role in pathogen dissemination, however there are proven presence of *Campylobacter sp.*, *Salmonella sp.*, *Mycoplasma gallisepticum* and *Mycoplasma synoviae*. For the detection of *Campylobacter sp.* and *Salmonella sp.* swabs were taken either from the intestine of cloaca. Meanwhile for the detection of *Mycoplasma gallisepticum* and *Mycoplasma synoviae*, swabs were taken either from the choanal cleft or trachea.

MANAGEMENT OF HOUSE CROW

House crows (*Corvus splendens*) have been listed as crop pests and are undesirable due to their communal roosting behaviour or fouling of buildings and other property. They also have potential for competing with native birds species as well. The possibility of a need for the control and management of this avian species may arise with the establishment of populations in pest proportions now or in future. It is timely therefore, to discuss possible methods of controlling bird populations and a few studies of habitat modification as feasible long-term control programmes in Southeast Asia and beyond.

In Peninsular Malaysia, the hot spot areas for house crow nesting are in the Klang Valley or what is referred to as the Greater Kuala Lumpur, being densely located in Kuala Lumpur city centre, Kajang and Klang. As a measure for controlling

the crow population, the shooting method was the only method used to control the population of house crows that keep on increasing from time to time. This procedure was carried out by the local authorities at the few selected hot spot areas. However, there seems to be a lack of precautionary step taken during the shooting procedures due to the direct exposure to biological elements of house crows when collecting the death house crow. These might increase the risk of pathogen infection to the human health.

According to Yap & Sodhi (2004) there are several methods that are usually used to control the birds population, which are: (1) Direct control of bird populations: Direct methods to reduce the bird population such as killing, poisoning, use of baits, explosives and scaring are not effective in the long term. Use of guns is common in rural areas, but are not always feasible in cities, which is the reason why urban control killing is done after having trapped or netted the birds. Usage of toxic chemical may not kill immediately. However dead or dying birds and toxic substance themselves are threats to the public health when children and household pets get into contact with them (Johnston & Janiga 1995); (2) Sterilization of birds: Sterilization of birds depends on guaranteeing action of the chemical in delivering the material to the wild population. There is also the lack of species-specificity of the chemicals; (3) Scaring and bio-acoustic techniques: Usage of sound and scarecrow dummies are known to be effective for short periods. This method would not last long due to the birds that habituate to such stimuli within a few days (Johnston & Janiga 1995); (4) Habitat modification: Habitat manipulation has been espoused as the proper way to manage wildlife species. However, comprehensive information about the entire biology of birds is required for an effective habitat control programme (Johnston & Janiga 1995). The type of information required would depend on the nature of the disturbance caused by the invasive species. Habitat modification can take many forms, such as exclusion, agricultural and horticultural methods and food removal (Johnston & Janiga 1995).



Picture of local authority staff doing house crows shooting
Source: www.selangorku.com

Previous studies indicate that house crows may have several selected preferences for their nesting place. House crows may select trees with larger crown volume because they offer better concealment of nests from potential overhead predators, such as raptors. However, the biggest threat to their nests clearly come from below the canopy. However, although the canopy volume for most of the nesting trees maybe large in size, the interior of the crown are relatively sparsely foliated. Hence, it is important to note that although breeding house crows seem to have preference for trees with larger crown volume, it is probably not to conceal their nests.

Soh et al. (2002) have made a conclusion that density is only crucial in correctly identifying some nesting trees where the above seven other variables cannot—(built environment percentage, disturbance index, distance to nearest bin centre, crown volume diameter at breast height, open space percentage and distance to nearest food centre) but on its own it has little importance in distinguishing nests from random trees. This suggests that the other variables take precedence in nest site selection decisions, but a minimal degree of shadiness would be necessary in shielding the eggs and nestlings from exposure to the sun and its adverse effects.

The built environment is the most important factor, the concordance is high at 83.1% and this suggests that house crows have a strong preference for selecting more urbanised settings for nesting. The attractiveness of built environments to breeding house crow is probably linked to the availability of food. Since built environments are likely sources of greater food abundance, breeding crows need not travel far within an urban setting to look for food to nurture their young.

The importance of disturbance index variable emphasises the close association crows have with human settlements. Heavy pedestrian and vehicular traffic do not deter crows from nesting in such areas. In fact, there is a higher proportion of nesting occurring in more disturbed environments. However, it is more likely that crows select such areas not because of high disturbance level per se, but because they are attracted to the larger wayside trees that line the busy pedestrian walkways, roads or parking lots.

Bin centres are important sources of food for crows. Bin centres can thus serve as a ready and constant supply of food scraps. The fact that a high proportion of nests are located in close proximity to bin centres again reiterates the point that nesting crows probably select nest sites near feeding sites. At two study sites in Malaysia, Nordin & Yusof (1980) observed that crow nests were located close to a municipal rubbish bin and at the central market.

Referring to the observations, by Soh et al. (2002) suggested that it would be advisable to plant alternative tree species (e.g. palms) that do not share similar morphological characteristics - upward pointing and V-shaped terminal branches. Another possible management measure that should be taken may be to regularly prune trees with larger crown volume, thicker trunks and denser canopies, to upset ideal nesting conditions for the house crows. However, it is clearly shown that the most direct approach would be to seek out and actively destroy nests.

Nordin & Yusof (1980) suggest that the distance to food source might play a significant role in brood size reduction. Since the relocation of bin centres away from nest sites is not feasible due to high costs and inconvenience, a simpler solution would be to implement minor alterations with regard to the design of the existing bin centres. Educating the public to cultivate the habit of proper waste disposal is also strongly encouraged. Lastly, it should be added that authorities might be needed to consider the roost preference of the house crows in Peninsular Malaysia in order to achieve more comprehensive management.

CONCLUSION

There is still no significant evidence on the widespread of house crows disease among human. However, precautionary steps still have to be taken

in order to avoid health problems to human and provide negative impacts on the environment, economy and livestock. The local authorities might be need to consider the roost preference of the house crows in Peninsular Malaysia in order to achieve more comprehensive management. By understanding the crows' movement patterns and habitat preferences, management practices can be more focused and successful. The presence of house crows have proven to be undesirable because of the disease factor to human and livestock. Even the acts of controlling their numbers by shooting could invariably cause harm to human if they are not properly carried out. It is without doubt that their presence casts a doubt about the sustainability of an area, particularly on cleanliness, safety and health. Without validation exercises with the local population, it can be safely concluded that the presence of house crow is an unsustainable urban indicator. It is recommended that more studies should be carried out on this matter.

ACKNOWLEDGEMENT

The authors would like to thank the project Options for Sustainable Regional Development Planning that is coordinated by LESTARI of UKM (Project Code XX-02-2012) and The Sustainable Community Capacity Building research group that is also helmed by LESTARI of UKM (Project DPP-2013-070) for supporting and sponsoring their participation in EMUR 2013.

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Received: 12 July 2015

Accepted: 10 February 2016

