



Australian Government
Australian Centre for
International Agricultural Research

Final report

project

Identification of policy responses to minimise negative socioeconomic impacts of an avian influenza epidemic in Indonesia

project number AH/2004/032

date published August 2009

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final report number FR2009-30

ISBN 978 1 921615 28 3

published by ACIAR
GPO Box 1571
Canberra ACT 2601
Australia

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1 Acknowledgments

These projects are collaborations involving dozens of people working in teams to undertake the surveys, sort out the responses and then understand what is happening. It would be impossible to name all of the scientists, enumerators and data people however I am grateful to all of you for your efforts.

I am especially grateful to Dr Ray Trewin, formerly of ACIAR, and to Dr Tri Satya Putri Naipospos and Dr Anak Agung Gde Putra, both officials of the Directorate General Livestock Services in the Ministry of Agriculture for assistance in setting up the project. Dr David Vanzetti from the School of Asian Studies at Australian National University worked on Indonesian trade effects of AI and Prof. Rina Oktaviani from Institut Pertanian Bogor worked on country-wide effects. Dr Dwi Budi Santosa from Brawijaya University co-ordinated the field work and 'cranked' the econometrics. The survey teams were led in Bali by Suharyanto and in Lombok by Nurul Hilmianti both of whom are officers with the provincial Assessment Institutes for Agricultural Technology. These people were central to the success of the project.

2 Executive summary

Poultry losses from avian influenza (AI) have posed two economic dilemmas for the Indonesians. The first dilemma is that risks associated with the disease in the future are only understood in the most general way. A thorough risk analysis was needed to ensure the Government of Indonesia can make sound judgments about the amount of effort needed to fight the disease in future. The second dilemma concerns where such effort should be directed. Good policy requires that money used to fight the disease is allocated between the various components of the AI program so as to achieve the best possible results.

Survey responses from 1600 households were used to identify farm level financial losses from AI, exposure to extension, use of biosecurity and vaccination and how farmers were making decisions. In addition, studies were undertaken at national level to measure the impacts of AI on other industries through effects on consumers and the tourism, travel and construction industries. This information resulted in a range of suggestions for policy enhancement. These included that government agencies should integrate management of AI at farm level with their management of other poultry diseases, improve the effectiveness of extension campaigns by using media and existing farmer networks rather than individual farm visits and agencies should encourage biosecurity and vaccinations by farmers through improved extension and possibly subsidisation of farm chemicals.

Around 60 Indonesian staff from Provincial level Ministry of Agriculture agencies received training in epidemiological aspects of the AI, farm survey techniques and analysis of animal disease programs.

Information about AI obtained from the study was extended to a range of stakeholders through two workshops. The first workshop was conducted in Bali and the second was convened by the Centre for Agro-Economic Research in Indonesia (CASEP) in Bogor. Publications have been produced in English & Bahasa. Fifty copies of the Bahasa report were distributed to appropriate Indonesian government officials, researchers and officials of NGOs involved in the AI response.

The direct effects of the epidemic are on farmers and others directly linked to the poultry industry such as input suppliers, processors, sellers and consumers. Improved government policies for controlling and managing spread of the disease will increase productivity in suppliers leading to increased income. Consumers benefit from reduced uncertainty and lower prices for substitutes for chicken perceived to be 'tainted'. In this context, poultry products are a mainstay of the Indonesian diet so even small reductions in such losses would be important for reducing poverty. Improved management of AI will also reduce the indirect effects of AI on related industries such as tourism, travel and construction.

Future research should broaden the study to incorporate Provinces outside the eastern islands group. In particular, there are likely to be potential gains from enhancing policy in Eastern Java which is the 'centre' of the Indonesian poultry industry.

3 Background

In mid 2003, the AI (AI) virus, H5N1, caused devastating losses in China, Thailand and Vietnam. By mid-2004 eight countries had reported confirmed outbreaks to the Office International des Epizooties including Indonesia with outbreaks in 14 out of 33 provinces. In January 2004, officials in the Indonesian Ministry of Agriculture officially reported the disease to OIE. Since then the Food & Agricultural Organisation has reported bird deaths in eastern Indonesia in Lombok, Sumbawa and Flores.

The AI outbreak has posed two economic dilemmas for the Indonesians. The first dilemma is that risks associated with the disease in the future are only understood in the most general way. A thorough risk analysis was needed to ensure the Government of Indonesia (GOI) could make sound judgments about the amount of effort needed to fight the disease in future. The second dilemma concerns where such effort should be directed. Good policy requires that money used to fight the disease is allocated between the various components of the AI eradication program so as to achieve the best possible results.

The aim of the project was to assist the Indonesian Government with solving these dilemmas. The broad research approach was to focus on measuring the direct, indirect and international trade effects of AI against the background of the efforts that were being made to fight it. The operational approach in the project was to work with individuals in the major Indonesian agencies that were involved in managing AI in the field. Research collaboration and the associated training programs eventually involved three Indonesian Ministry of Agriculture agencies and two Indonesian universities.

The major research focus of the project was on welfare losses from reduced poultry productivity arising directly from AI poultry deaths and from the extra costs arising from managing the disease. Analysis included measurement of farm losses, identification of economic and social factors influencing these losses and the effectiveness of Indonesian policy efforts. The second round effects from AI were also evaluated. These included ripple effects in the broader economy coming directly from poultry losses and indirectly from fears associated with a human pandemic. Contractions in consumption of poultry products were evaluated along with actual and potential losses in the transport, construction and tourist industries. The third research goal of the project was to evaluate the economic impact of AI on Indonesian international trade.

The project concluded with two workshops. The first workshop was held in Bali and included officials from provincial and district levels who work on a daily basis with AI as well as farmers and their representatives and upstream industry stakeholders from the feed and chemical industries. The second workshop was held in Bogor and included national, regional and provincial officials as well as national level industry representatives. Fifty copies of a major report in Bahasa on the results of the project were distributed to stakeholders in March 2008.

4 Objectives

Objective 1: Specify & estimate biometric models of poultry farming on Bali and Lombok for (i) medium-sized broiler production, (ii) medium-sized egg production and (iii) kampung chicken production so that factors determining direct economic impacts of the epidemic at farm level can be understood.

Objective 2: Specify & estimate a Computable General Equilibrium model disaggregated by sector and industry including poultry meat and egg industries to provide impact multipliers for different scenarios of animal losses, human losses and to include consumer reactions so that indirect impacts of the epidemic beyond the farm can be understood.

Objective 3: Specify & estimate a model of international trade in poultry products which focuses on links to Indonesia so that choices about control strategies take trade implications into account.

Objective 4: Development of policy recommendations and results pertinent for extension to farmers and other stakeholders.

5 Methodology

Objective 1

Collaborators were trained in conducting household surveys and four household data sets gathered using randomised sampling techniques. There were two sets from Bali and two from Lombok. The sample sizes were 200 for each medium sized farm survey, one each from Bali and Lombok, and 600 households in each smallholder survey, again one each from Bali and Lombok. This gave 1600 households in total.

Initial data analysis was undertaken in the provincial offices of Assessment Institute of Agriculture Technology (BPTP) in Bali and Lombok. This involved entering data into spreadsheets, ensuring it was clean and deriving summaries. Econometric analysis was undertaken at the University of New England by the project leader and a colleague from Brawijaya University. The reports were written at University of New England (UNE) in consultation with BPTP staff.

Objective 2

Work on the Computable General Equilibrium model was undertaken by Professor Rina Oktaviani and her staff at Institut Pertanian Bogor. This included collection of data to update an existing Social Accounting Matrix and estimation of the models.

Reports were written at IPB in consultation with Assoc. Prof. Phil Simmons at UNE. Prof. Oktaviani presented the paper at the Australian Association of Agricultural Economists annual meetings in 2007 and 2008 to get peer feedback. The work is now being prepared for publication in an internationally peered journal.

Objective 3

A model of international trade flows in poultry products was developed by Dr David Vanzetti at the School of Asian Studies at the Australian National University. Dr Vanzetti presented the paper at the Australian Association of Agricultural Economists annual meetings in 2007 to get peer feedback on the work and is currently publishing the work in a peer reviewed journal.

Objective 4

The final reports on Indonesian commercial and public policy were undertaken by:

1. Dr Agung and his staff at the Disease Investigation Centre in Bali
2. Dr Sudaratmaja and his staff at the Assessment Institutes for Agricultural Technology (BPTP) in Bali
3. Dr Soegiarto and his staff at the Assessment Institutes for Agricultural Technology (BPTP) in Lombok
4. Professor Oktaviani and her staff at IPB
5. Associate Professor Simmons and Dr Budi Santosa at the University of New England

These reports were based on integration of empirical results obtained from the surveys with interviews with local livestock authorities and with upstream and downstream industry people. A major Indonesian language report was written and 50 copies were distributed in early 2008 to coincide with the two workshops held in Bali and Bogor.

6 Achievements against activities and outputs/milestones

Collaborators trained in conduct of household surveys

Objective 1: To conduct four surveys of Indonesian Poultry Producers to obtain data for biometric modelling and other producer information

no.	activity	outputs/ milestones	completion date	comments
1.1	Training of enumerators ~ survey 1	(1) Class room training on AI (2) Class room training on interview techniques (3) Field training and piloting of surveys	June 2006	Three days training in class room environment plus one day computer training for data cleaning and computer conducted at BPTP (Bali)
1.2	Training of enumerators ~ survey 2	(1) Class room training on AI (2) Class room training on interview techniques (3) Field training and piloting of surveys	Nov 2006	Three days training in class room environment plus one day computer training for data cleaning and computer conducted at BPTP (Lombok)
1.3	Training of enumerators ~ survey 3	(1) Class room training on AI (2) Class room training on interview techniques (3) Field training and piloting of surveys	Sept 2007	Three days training in class room environment plus one day computer training for data cleaning and computer conducted at BPTP (Bali)
1.4	Training of enumerators ~ survey 4	(1) Class room training on AI (2) Class room training on interview techniques (3) Field training and piloting of surveys	Nov 2007	Three days training in class room environment plus one day computer training for data cleaning and computer conducted at BPTP (Lombok)

PC = partner country, A = Australia

7 Key results and discussion

7.1 AI and poverty

The effects of AI on the broader Indonesian economy can be expected to be minimal in the future in the absence of a viral mutation leading to a human pandemic. Direct losses are still important to individual AI-affected farmers however are not consequential at a macroeconomic level and have not been so. In addition, AI has had little effect on Indonesian international trade nor is it expected to.

The survey indicated losses to Balinese & Lombok smallholders from AI are relatively small compared to total incomes for these households. AI is not the major constraint on increasing smallholders' consumption of animal proteins. In the context of poultry production, the major disease threat to the Indonesian poultry industry remains Newcastle disease and the latter is still an important cause of poverty.

The major farm losses from AI in the early years of the disease were price related reflecting consumer panics. Prices dropped by around 75% in the flu seasons of 2003-04, 2004-05 and 2005-06 and all farmers, including those with disease free status, suffered since everyone got the same price. In the last two AI seasons these price effects have diminished or disappeared in Bali and Lombok reflecting that consumer effects are no longer so important. In this regard, consumers panicked following the AI outbreaks in the early years of the disease however prices indicate news about AI is no longer affecting consumption. Consumers are learning to live with the disease and, apparently, from the virtual absence of consumer deaths, are able to protect themselves against it. Notably newspaper reports of human deaths from AI in Bali in 2007 did trigger a local market crash, albeit short lived.

AI caused significant fear-related shocks to tourism, travel and construction industries in the early stages of the disease however these have abated as more is known about the risks associated with the disease. AI did not significantly affect Indonesian trade in poultry products which has been thin in recent years.

7.2 Provision of Extension by Indonesian Authorities

The surveys indicated adoption of biosecurity and purchasing of vaccines is likely to be an effective & profitable strategy for both smallholders and sector 3 farmers to reduce AI losses. The issue is that levels of adoption have been low amongst sector 3 farmers and non-existent with smallholders producing kampung chickens. Improved extension of information to smallholders about vaccines and other biosecurity measures could be effective. While adoption of bio-security and vaccination were, in principle, profitable options for smallholders, incentives are needed to reduce costs of biosecurity. This could possibly involve subsidies for vaccines and other relevant chemicals.

Very few Sector 3 poultry producers received much help from extension services after AI started in Bali and Lombok. Most reported learning about the disease from the media, relatives, neighbours, feed suppliers and the like. Few had visits from extension officers with visits, when they did occur, being to farms already struck. Since very few of these farmers had good biosecurity practices, increased provision of extension services could be expected to be beneficial. Local authorities reported undertaking ring vaccination programs however few respondents were recipients of this service reflecting complaints from authorities that they were chronically under-resourced.

7.3 Targeting of AI Policy

From a statistical standpoint, smallholders affected by AI had no outstanding features (such as being small in scale etc) that would allow better targeting of extension or other AI related policy. This suggests policies should be broad based rather than having just a few expensive household visits by government officials. Broad based approaches could use the media, village farmer groups and networks and industry associations to disseminate information.

7.4 Need to Integrate Animal Disease Policies

Indonesian government agencies might operate more effectively if they adopted an integrated management approach to poultry diseases based on a 'portfolio of diseases' approach. Such an approach might overcome the considerable overlap in extension and veterinary services provided on a 'disease by disease' basis. In fact, existing animal health services usually are integrated in Indonesia however AI appears to have been dealt with as a stand alone disease. Presumably this reflects the panic over human pandemics and international reaction when the disease first got going. The result has been a poorly resourced, thinly spread program missing most farmers. The approach may also have resulted in diversion of scarce resources away from other important animal health programs.

8 Impacts

8.1 Scientific impacts – now and in 5 years

The results of the project have been extended to GOI officials at national, provincial and local levels through two workshops and an Indonesian language report. This is expected to result in better understanding of costs and risks associated with AI leading to improved prioritisation of government policy.

Management of AI needs to be integrated with other disease management programs so scale economies can be achieved helping farmers. This result, as well as other results on the ineffectiveness of some local level AI programs will hopefully lead to better prioritisation of animal health policies at district and provincial levels.

8.2 Capacity impacts – now and in 5 years

Improved skills in conducting surveys of farmers, analysis of results and policy analysis should result in improved policy formulation by the Assessment Institutes for Agricultural Technology in Bali and Lombok. These organisations are directly involved in innovation and its extension to farmers so tools for understanding the needs of farmers are of central importance.

8.3 Community impacts – now and in 5 years

8.3.1 Economic impacts

The direct effects of the epidemic are on farmers and others directly linked to the poultry industry such as input suppliers, processors, sellers and consumers. Improved government policies for controlling and managing spread of the disease will increase productivity in suppliers leading to increased income. Consumers will benefit from reduced uncertainty about the safety of poultry food products. In this context, poultry products are a mainstay of the Indonesian diet. Even small reductions in such losses would be highly significant.

Improved management of AI will reduce the indirect effects of AI on related industries such as tourism, travel and construction.

8.3.2 Social impacts

Improved policies for AI should have a social impact by increasing incomes, increasing consumer choices and reducing human deaths.

8.4 Communication and dissemination activities

Two workshops were conducted in this project. The first workshop was conducted in Bali and included provincial and district stakeholders from Bali and Lombok. It was convened by the Assessment Institute for Agriculture Technology (Bali) and included representatives from the Provincial Governments of Bali and Lombok, the Disease Investigation Centre (Region 6), District Livestock Offices in Bali and Lombok and local industry stakeholders and farmers.

The second workshop was convened by the Centre for Agro-Economic Research in Indonesia (formerly CASER now CASEP) in Bogor. This provided the national level policy perspective for senior Ministry officials based in Jakarta and national level industry association representatives.

The most important publication pathway is the Bahasa report of results from the project distributed to appropriate Indonesian government officials, researchers and officials of NGOs involved in the AI response. Fifty copies of this report were printed and distributed to key stakeholders.

Some peer reviewed journal publications have also been undertaken. These will put results from the project on the durable public record in libraries contributing to knowledge used to develop policy actions when new animal disease epidemics occur.

9 Conclusions and recommendations

9.1 Conclusions

Direct losses from AI for Balinese and Lombok farmers producing poultry products are relatively small compared to total incomes for these households.

As Indonesians learn more about AI two major sources of welfare loss from AI will diminish. First, price effects, initially the major source of loss to farmers are diminishing as consumers overcome fears about infection. Second, fears of a human pandemic had critical effects on activity in the travel, construction and tourism industries. These fears are now diminishing, unwisely or not.

Indonesian international trade has not been affected by AI to date and is unlikely to be affected in the future.

Purchasing more vaccines and undertaking biosecurity are likely to be effective & profitable strategies for smallholders to reduce AI losses.

Farmers have not been well served by extension agencies in regard to AI and need to be better informed.

There are no definitive indicators of vulnerability to AI that could be used to better target extension services.

9.2 Recommendations

Losses to Balinese smallholders from AI are relatively small compared to total incomes for these households. Controlling AI is not the major constraint on increasing smallholder consumption of animal proteins. Smallholders need improved government support in a range of animal husbandry areas which should be prioritised more highly than managing AI. These might include more intensive husbandry practices across a range of animal species and better genetics and breeding and development of integrated programs to deal with a range of animal diseases, not just AI

Purchasing more vaccines and undertaking biosecurity are likely to be effective & profitable strategies for smallholders to reduce AI losses. However, if AI is to be managed effectively more government support for smallholders is needed. In particular, improved extension of information to smallholders about vaccines and other biosecurity measures would be effective.

Incentives are needed to reduce costs of biosecurity and vaccination. Policies such as subsidies for vaccines and for other relevant chemicals should be considered.

Extension about AI needs to be more broadly targeted. Broad based approaches such as media campaigns and using farmer networks and groups are likely to be more effective than expensive household visits by government officials.

9.3 List of publications produced by project

Vanzetti, D. 2008. The potential trade impacts of AI on the Indonesian poultry sector, Bulletin of Indonesian Economic Studies, (forthcoming)

Balai Pengkajian Teknologi Pertanian Bali, 2008. AI: Pengkajian, Kebijakan Pemerintah dan dampak sosial ekonomi, Prosiding Workshop, ISBN: 978-979-1415-14-9

Oktaviani, R, 2008. Impact of AI (AI) on poultry and other related sectors in the Indonesian economy: a recursive dynamic CGE approach. Contributed paper to the 52nd Annual

Conference of the Australian Agricultural and Resource Economics Society, 8-10 February 2008, Canberra, ACT

Oktaviani, R, 2007, AI and its impact on the Indonesian economy: a CGE approach, Contributed paper to the 51st Annual Conference of the Australian Agricultural and Resource Economics Society, 8-10 February 2007, Queenstown, NZ.

Simmons, P.R., 2006, Perspectives on the 2003 and 2004 AI Outbreak in Bali & Lombok, *Agribusiness*, 22(4), 1-16.

Simmons, P.R., 2006, The Effect of AI on Sector Three Poultry Farms in East Java: Survey Results, 50th Annual Conference of the Australian Agricultural Economics Society, Manly, February.

Simmons, P.R., 2005, Perspectives on the 2003 and 2004 AI Outbreak in Bali & Lombok, 49th Annual Conference of the Australian Agricultural Economics Society, Coffs Harbour, February.