

Despite its encouraging economic growth in recent years, Papua New Guinea's social indicators remain among the worst in the region. Ranking 156 in the human development index (UNDP 2013), nearly 40 per cent of Papua New Guineans live in poverty (World Bank 2009).

Up to 90 per cent of the population is reported to depend mainly on subsistence agricultural for survival (FAO 2014), much of which involves the raising of livestock. However, animal production in Papua New Guinea is fundamentally limited by poor husbandry and disease. In addition, suboptimal laboratory services and limited animal health capacity places a major constraint on the ability of government to assist smallholders to reach higher levels of production.

This *In Brief* describes the development of a bibliographic database of research conducted and documented on animal health in Papua New Guinea. It provides a summary of the breadth of animal health research to date and offers some insights into the distribution of this research across species. The database has been created to assist in the design of a new research-for-development project on the provision of services to smallholder livestock owners in Papua New Guinea. The project is currently being developed with funding support from ACIAR.

References were found in the first instance by consulting people with experience in agriculture and animal health in Papua New Guinea and by reviewing earlier compilations of literature on similar subjects. Each article identified and collected was then used to locate further sources by examining its reference list. Basic search terms were entered into two major databases: CAB Abstracts (containing more than 7.4 million life sciences records from 1973 onwards) and AgBib (with a Papua New Guinean agricultural literature focus, maintained by the Australian National University). Examples of basic search terms include names of common domestic species (e.g. 'cattle') along with words relating directly to health such as

'disease' and 'nutrition'. Some key journals (e.g. *The Papua New Guinea Journal of Agriculture, Forestry and Fisheries* and its predecessors, and *Harvest*) were also examined issue by issue for articles relating to animal health.

Although the database focuses on domestic animals, research findings relating directly to disease in wild animals are also included. Work that simply describes newly discovered wild species or illustrates biological or population data of a wild species only, with no reference to health or disease, is excluded. Work relating to zoonotic disease (i.e. disease that can be transmitted between animals and humans) is included, although papers on human health only with no reference to zoonotic disease or animal health are excluded, except in the case where the involvement of animals as hosts is of major importance. Work that relates to animal production is included, although work that purely focuses on sociological and cultural aspects of animal ownership is omitted. Pure entomological studies that are judged to have little relevance to domestic animal or human health are also excluded. There is no date specification, so any studies meeting the above criteria, regardless of publication date, are included.

Where possible, hard copies of articles were located and scanned; details were entered in the sheet 'Hard Copy Available'. Where hard copies could not be located, details were entered in a separate sheet and labelled 'Grey Literature'. Where the location of hard copies was identified but the author could not physically attend the premises, details were entered in a third sheet 'Literature Alternative Sources'. In each of the sheets, details were divided into categories and ordered chronologically.

In total, 547 publications related to animal health in Papua New Guinea were identified and listed. Of these, 141 articles could not be located in libraries in Australia (and are listed as 'Grey Literature'). Most articles were published between 1971 and 1991 — articles published before 1961

and after 2000 are less common. The slow decline in publications after 1991 is probably caused by a combination of cuts in funding for agricultural research, along with governance issues that have plagued the country since its independence in 1975.

Zoonotic disease is the most common subject in articles published on animal health in Papua New Guinea, despite the fact that articles were eliminated if animal health was not mentioned or if the involvement of an animal host was not considered important.

Poultry, cattle and pigs feature most prominently after zoonotic diseases, which is expected given their significance in Papua New Guinea. When the estimated population of each livestock species in Papua New Guinea (Bourke and Harwood 2009) is compared to the number of articles published on that species, ratios are very similar for small ruminants, poultry and cattle — at about one article for every 1070–1100 animals. However, using these criteria, pigs are essentially understudied with one article per 25,000 animals.

A significant proportion of the literature identified is so-called 'grey literature' — articles that have not been formally published in peer-reviewed journals and that are often available in only a small number of hard copies in a few offices and libraries. Such articles are difficult for researchers to access and can easily become lost (e.g. as collections in offices on research stations deteriorate or are discarded). In total, 25 per cent of the papers identified cannot be located and appear not to be formally published. This figure is likely to be an underestimate, as there is almost certainly a greater body of unpublished work that could not be located by the method used to compile this bibliography. Part of the aim of compiling the bibliography described was to identify and digitise as much grey literature as possible, within the constraints of the method and resources available, before it becomes forgotten or lost. Such research has limited ability to inform current researchers and users of research, including policy-makers, when it remains unpublished or, worse still, becomes lost. Research is expensive and often seen as a luxury in developing countries,

and it is to be hoped that further work will be undertaken to identify and digitise more articles on animal health in Papua New Guinea to ensure it is available in the future. The bibliography is available through the SSGM publications [website](#), and for further information on the location of hard copies, researchers can contact Dr Mike Nunn at <mike.nunn@aci.gov.au>.

The compilation of such a wide breadth of literature from a developing country context highlights the role grey literature plays in such settings and the risk that this entails of information being lost. It demonstrates the importance of collating literature into accessible bibliographies that highlight gaps, preserve grey material, and inform those designing future projects (both pure research projects and research for development projects).

Author Note

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