

## More than a political slogan: the value of *kastom* in extension for sustainable agriculture in Vanuatu

Chris Radcliffe<sup>1</sup>, Norah Rihai<sup>2</sup>, Cesidio Parissi<sup>1</sup> & Anantanarayanan Raman<sup>1</sup>

<sup>1</sup>School of Agricultural & Wine Sciences, Charles Sturt University, Locked Bag 588, Wagga Wagga, NSW 2678

<sup>2</sup>Vanuatu Agriculture College, Charpius 3, PO Box, 218, Santo, Vanuatu  
Email: radcliffechris@hotmail.com

**Abstract.** Traditional Vanuatu *kastom* (the Bislama term for culture) has dictated sustainable agricultural practices for over three thousand years. However recent shifts toward cash cropping, growing urbanisation, population growth and climate change have raised concerns over national food security and the sustainability of the agriculture sector. *Kastom* is often used simply as a political slogan for national unification, however it may provide a way forward in enhancing agricultural extension, and in turn the sustainability of the agricultural sector. The aim of this paper is to explore the potential for extension programs to be more inclusive of *kastom* in order to more effectively promote sustainable agriculture. By demonstrating its value for sustainable agriculture, *kastom* may become more than just a political slogan. Semi-structured interviews and participant observations were methods used to collect data from smallholder indigenous farmers. Evaluation of the data suggests that, for many farmers, *kastom* continues to be an integral part of their daily agricultural practices and that many of these practices promote sustainable agriculture. The paper concludes that extension programs which complement *kastom* systems may have enhanced outcomes, however further research is required.

**Keywords:** *kastom*, extension, agriculture, Vanuatu, indigenous, culture, knowledge

### Introduction

First settled more than 3,200 years ago (Bedford 2006), Vanuatu is an archipelago of 83 islands, 63 of which are inhabited, which lies in the South Pacific Ocean approximately 1750km from Australia. Of the 235,000 people who inhabit these islands around 76% are involved in small-scale family farming (VNSO 2009). The population is predominantly (98%) indigenous, known as Ni-Vanuatu (VNSO 2009). Vanuatu has been noted as one of the least developed countries in the world (United Nations 2015). Added to this is that Vanuatu's exposure to natural hazards along with a limited adaptive capacity makes it one of the most vulnerable countries at risk to climate change (Welle, Birkmann & Rhyner 2014; SPC 2015).

The staple foods for Ni-Vanuatu are root crops, particularly yam (*Dioscorea alata* L.) and taro (*Colocasia esculenta*) which dominate the dry and wet season respectively (Lebot, Malapa & Sardos 2015). Sweet potato (*Ipomoea batatas*) and cassava (*Manihot esculenta*) are increasingly common across most regions of Vanuatu. Island cabbage (*Abelmoschus manihot*) is the most common leafy green vegetable grown.

Agriculture in Vanuatu is experiencing a significant shift from the traditional sustainable practices. Urbanisation, population growth, an increasing consumption of imported food and reduced prices for major export crops all require farmers to think more strategically about practices and selection (Harrison et al. 2016). Whilst the purpose of agricultural extension is to support and facilitate farmers to solve problems and obtain information (Davis 2008), the effectiveness of the Vanuatu extension services is hindered by a lack of qualified staff, funding for transportation and production of extension materials, and the continued use of top-down approaches (Greer Consulting 2008). Extension practices also fail to recognise the existing knowledge capital already held by many farmers, that of indigenous knowledge and *kastom* systems.

Despite the volume of food produced in Vanuatu, it is the deficiencies in vital micronutrients, which are leading to food insecurity in Vanuatu (Welegtabit 2001). The 2009 FAO declaration of the World Summit on Food Security explicitly linked sustainable agriculture to global food security (FAO 2009). As such, to improve food security in Vanuatu we suggest that sustainable agriculture be a core focus of extension services and that the existing indigenous knowledge may support this.

Sustainable agriculture centres on producing food by using, and without damaging, natural assets, requiring a balance of social, environmental and economic factors. A general definition of sustainable agriculture is given by the International Commission on the Future of Food and Agriculture (2006, p. 15) as something which 'maintains the natural resources needed, preserves communities and social and cultural systems that allow for the appropriate distribution of food, and provides the possibility of descent livelihoods in rural areas'. What is clear from this definition

is that sustainable agriculture requires a multi-pronged approach, which will include indigenous farming knowledge, technology, and the support of national and international governing policies.

Whilst there is growing evidence that the application of indigenous knowledge can result in enhanced sustainable agriculture (see Hart 2007; Lwoga, Ngulube & Stilwell 2010; Kola-Olusanya 2012), much of this research tends to focus on empirical and practical knowledge such as soil classification (see Saito et al. 2006), conservation (see Juanwen, Quanxin & Jinlon 2012) and biodiversity (see Ziembicki, Woinarski & Mackey 2013), disconnecting the knowledge from the culture in which it was embedded. Decoupling indigenous knowledge from its socio-cultural context creates an ambiguous science-like representation 'which encourages focussing on those aspects thought to mirror our science and technology and likely to prove amenable to further manipulation' (Sillitoe 1998, p.189).

Indigenous knowledge in Vanuatu is guided and regulated by *kastom*. The term *kastom* has become a well-used political slogan. *Kastom* is used in press releases, policies and legislation, often as a call to national unification (Miles 1998). Such catch cries seem only to create friction, as they attempt to create a national identity out of something which is geographically and linguistically specific (Jolly 2002). *Kastom* is much more than a political slogan and understanding *kastom* may provide opportunities for extension officers to support the progress of farmers toward more sustainable agricultural practices.

### **Vanuatu *kastom***

With over 80 local languages, Vanuatu is one the most linguistically diverse nations in the world (Crowley 2000). In addition, with constant migration between islands, along with the introduction of Christianity some 150 years ago, it is difficult to generalise about *kastom* beliefs and practices (Hickey 2006). What is clear is that *kastom* continues to influence, to varying degrees, all Ni-Vanuatu people.

*Kastom* systems encompasses the beliefs, attitudes and behaviours of Ni-Vanuatu, it is 'a whole way of life that dictates almost all of one's actions and provides its own particular interpretation for almost everything that happens' (McClancy 2002, p. 20). *Kastom* and agriculture coexist, yet remain strongly connected, as described by a traditional elder 'without *kastom* we cannot have agriculture and without agriculture we cannot have *kastom*'.

*Kastom* is not a set of rules which can simply be learnt, *kastom* is implicit and embedded into all facets of daily life. *Kastom* describes one's place within the landscape, the connection between soil, water and air and describes the heritage of the Ni-Vanuatu (Bolton 2003; Forsyth 2009). *Kastom* systems not only provide a governance of social, technological and economic systems, but central to *kastom* are the metaphysical beliefs held by Ni-Vanuatu (Jolly 2002). Ancestors play a pivotal role in maintaining the social and moral order of the community, indeed it is the ancestors that provide the 'power' for *kastom*. Despite the strong belief in and strict adherence to *kastom* by Ni-Vanuatu, many scientists view *kastom* as a hindrance (Cronin et al. 2004). Such views devalue *kastom* and prioritise western solutions to agricultural problems, leading to top-down scientific reductionist approaches to agricultural extension. Critics argue that the indigenous knowledge cannot be separated from culture and therefore has little value outside its cultural context (Swartley 2002). Such devaluation erodes indigenous knowledge and cultural practices, promotes the process of cultural homogenisation and diminishes the knowledge resources required to solve the growing global ecological crisis.

Some anthropologists declare that Pacific populations engaged in a revitalisation of their culture are simply 'constructing' inauthentic beliefs because the real culture has been lost due to globalisation and colonisation (Gegeo & Watson-Gegeo 1999). It may be ineffective to revitalise *kastom* to its original state, not only because much has been lost already, but also that not all *kastom* practices encourage sustainable agriculture. However, agricultural extension may promote those *kastom* practices which contribute to sustainable agricultural development.

The aim of this paper is to explore the potential for extension programs to be more inclusive of *kastom* in order to more effectively promote sustainable agriculture. By demonstrating its value for sustainable agriculture, *kastom* may become more than just a political slogan. By exploring the potential for Vanuatu agricultural extension services to work within *kastom* systems it is hoped that the paradigm of current extension approaches may shift toward promotion of more sustainable agricultural practices. The paper begins with a general examination of *kastom* and the way it dictates the beliefs and behaviours of Ni-Vanautu. We then evaluate the applicability of *kastom* for sustainable agriculture. The paper concludes with the limitations in working within *kastom*, highlighting recommendations for future consideration.

## Research Background

This paper stems from PhD research, which attempts to assess mechanisms that promote and restrict agricultural extension in developing countries. Initial findings (Radcliffe et al. 2016; Radcliffe 2017) identified that indigenous knowledge has the potential to make a significant contribution to sustainable agriculture; however, its cultural embeddedness limits its ability to be transferred. This current paper focuses on the potential for extension programs to work within the cultural context with the aim to determine the contribution *kastom* may be able to make to sustainable agriculture in Vanuatu.

## Method and study site

The cultural framework established for this research was based the Kaupapa Maori research philosophy developed by Smith (1999). The Kaupapa Maori research philosophy provides a reliable working framework for non-indigenous researchers conducting research in indigenous communities.

The study site was the island of Espiritu Santo, or just Santo as it is known locally. Santo is Vanuatu's largest island, 4010 km<sup>2</sup>, with a chain of mountains running along the West coast and a flat limestone plain on the east and south.

Qualitative data used in this study was mainly drawn from purposive sampling of indigenous smallholder farmers. Data was collected over two years between 2016 to 2017 from 33 semi-structured farmer interviews, 30 farmer observations and 6 semi-structured interviews with extension officers across 13 villages on the island of Espiritu Santo. Data collection was approved by Charles Sturt University Ethics Committee and analysed through thematic analysis.

## Findings and discussion

*Kastom* agricultural systems in Vanuatu have been practised for thousands of years. Indigenous farmers have created sustainable systems which rely on low input technology, use complex biological interdependencies which suppress natural pests and use diverse farming systems.

The remainder of this paper is given to demonstrating the value of *kastom* to enhance each of the above principles of sustainable agriculture on agricultural extension.

### **Integrate ecological and biological processes**

Indigenous farmers of Vanuatu have developed, over thousands of years, an integrated system of trees, mixed cropping, natural rain-fed irrigation and extended fallow periods, all of which are governed by *kastom* systems. *Kastom* goes hand-in-hand with agriculture, the two cannot be separated. This connection is further explained by a farmer from the village of Lorevuilko:

*Kastom* governs our agricultural system, *kastom* is like an umbrella, there are many things under the umbrella. Whenever there is a community, it lays on agricultural land and land is one of the powers of *kastom*, so the community cannot have *kastom* by itself, it needs to have farmland.

It is *kastom* which governs what is planted, where it is planted and what should be integrated into the agricultural system. *Kastom* is something which belongs to the Ni-Vanuatu people, it connects them with their spirits, with their history and with their environment. Core to this connectivity are totems. Ni-Vanuatu use totems to connect with spirits and ancestors, which naturally leads to a need to protect and manage the land. A farmer from the village of Fanafo (central east Santo), whose totem was a snake, described her ability to talk to snakes and she explained that this helped her to stay connected to her land.

A key shift away from sustainable agriculture is the shortening of fallow periods, causing loss of soil fertility and leading to declining yields. This generally occurs as farmers shift from traditional crops to cash crops. By working within *kastom* systems, extension agencies may be able to promote the need for fallow periods. An example of a *kastom* system which promotes fallow periods is from the village of Lorevuilko:

After a man does the pig killing ceremony, he has to spend about 10 days doing a learning process where he gets a rank. There are 10 stages to the chiefly position. During the 10 days [of the first stage] you spend time in the *nakamal* where you get taught how to govern the farm land. In a fenced area you get instruction from *tora*<sup>1</sup> all the *kastom* laws are taught here. When you are in there you are painted, you are decorated, after 10 days you have to go out into the farmland, there you have a shower, you stand in the middle of a big farmland and wash all the paint and it goes down into the land and the land becomes *tabu* [restricted area], so for certain years this land is *tabu*, for four to five years, for the trees to grow, for the wildlife to be plenty,

<sup>1</sup> The name which describes everything is *Tora* – all of the attached culture and beliefs started with this, it is the beginning.

so we cannot enter. There has to be a ceremony performed before we can enter that land. This is a way we practice conservation. Sometimes the *tabu* is for 10-20 years, for most, to make the land fertile it will be four years. The land size could be two to three kilometres. It happens in the community, so the community talks and says 'ok we have to leave this place', it's like a rotation, we used this place but know we leave it because we want it to be rich again.

Once the *tabu* period is finished, farmers will slash and burn the area and prepare it for planting, however certain trees within this area may remain *tabu*, as a farmer from Charpius village explains:

We have some trees ..... *kastom* says 'don't cut this tree', when I study and I find out that this tree is legume I find out that *kastom* is very important.

As evidenced in the above statement, although *kastom* may not be able to describe the science behind the nitrogen fixation process of legume trees, it does understand the holistic connection between the trees, soil fertility, and crop yield.

*Kastom* systems can be used to ensure a sustainable protein supply, as outlined in Table 1. The concept of conservation is fundamental to this *kastom* system, in fact the language term '*ungu*' used in Table 1, when translated to English, means conservation.

### **Minimise the use of inorganic inputs**

Chemical inputs are not broadly used across Vanuatu; however, they are available from commercial agricultural supply stores and promoted as an option for weed and pest management by extension officers. Currently the cost of chemical inputs is restricting many farmers from purchasing these chemicals, however if Vanuatu follows in the footsteps of other Pacific nations, the application of inorganic inputs will become a routine part of the agricultural systems. Therefore, it is worthwhile exploring ways in which *kastom* promotes the use of organic inputs.

*Kastom* systems utilise the phases of the moon when planting as it is believed that the full moon acts, as a farmer states, 'like a fertiliser'. However, the opposite is true for a new moon, see Table 2.

**Table 1. *Kastom* rules which manage protein intake**

<b>Language term</b>	<b><i>Kastom</i> practice</b>
<i>Ungu vatu</i> (stones/rocks)	The community constructs a rock/stone wall along the coastal line in order to encourage a crustacean habitat. People will often place branches, leaves, rotten fruit and coconut flesh into the crevices of the wall to encourage population growth. During drought periods families will collect the larger crustaceans to eat, leaving the smaller ones to grow.
<i>Ungu gai</i> (tree)	<i>Kastom</i> requires at least one fruit bearing tree per household to remain untouched during the fruiting season. This tree is used to encourage flying fox ( <i>Pteropus anetianus</i> ) and other birds to feed on the tree. The family will use a bow and arrow to selectively harvest the flying fox and other birds.
<i>Ungu wai</i> (water)	A <i>kastom</i> practice is to divert a river flow into a pond and then blocking the entrance with stones leaving fish, prawns and eels to grow. After a time the water is drained out and the mature animals are harvested and the others are left and the water is then redirected back to fill up the pond.
<i>Ungu tahi</i> (sea)	Similar to <i>ungu vatu</i> , but this process involves a large rock wall from the shallows to the reef. This area is <i>tabu</i> for several years until the Chief allows the community to harvest the fish and shellfish which have sheltered in the area. Once harvest is complete, the area is repaired and left for another two or three years.

**Table 2. *Kastom* regulated agricultural activities during moon phases**

<b>Moon phase</b>	<b>Agricultural activity</b>
<i>Vula goro</i> (full moon)	Planting of crops that are not yam, such as banana, kava, cocoa and coconut
<i>Vula mate</i> (new moon)	No planting during this time. It is believed that all living things are releasing their waste during this moon phase.
<i>Vula halabotu</i> (waning crescent)	The time when living organisms come out to feed, plant roots 'wake' to feed.

The increase of cash crops such as kava, cocoa, coffee and coconut is resulting in the more traditional staple crops being shifted to less fertile soils; as an agricultural extension officer explains 'people are locating [the cash crop] on the fertile soil and then they develop the unfertile

soil for [traditional crops]'. According to extension officers, such shifts are resulting in lower yields and increased use of inorganic inputs such as fertilisers. The yield reduction of traditional staple crops planted, such as yam (*Dioscorea* spp.) and taro (*Colocasia esculenta*), is resulting in families consuming what crops are being grown and not storing them in readiness for *kastom* ceremonies or times of drought, as an agricultural extension officer explains:

We used to preserve food, breadfruit [*Artocarpus altilis*] in a pit here, yam in a pit there and then there is food in the ground, now days there is no food preservation. Once we started losing that, we started losing everything. If we start getting this back using technology, then we can get back *kastom*

Inorganic input may be reduced through extension officers promoting food preservation techniques. In times of drought when there is a food shortage people store fermented fruits and use alternative foods such as wild yams (*Dioscorea nummularia*) and cycad (*Cycas rumphii*) fruits which are found in the jungle and not normally eaten. During good seasons the Paramount Chief places a *tabu* on harvesting wild yams as a measure to ensure they are available during drought. Promoting *kastom* systems for food preservation, whilst incorporating new techniques and technology of food preservation, may improve food security, particularly during food shortages, such as after cyclones or during droughts.

Traditionally, farmers had large numbers of pigs and chickens and were able to sustain these numbers by feeding them yams and taros from the food storage. Today, many pigs and chickens are being feed on imported products from the agricultural supplies store, a cost which significantly limits the number of chickens and pigs that each farmer has. Promoting *kastom* systems of food storage and preservation for animal food may reduce the need for imported feed and may also increase the quality and numbers of animals, all of which has the potential of enhancing community food security.

Whilst traditional crops such as yam, taro and sweet potato require less inorganic inputs compared to cash crops such as cucumber, watermelon, lettuce and cabbage, cash crops allow indigenous farmers and their family access to education and medicine. Therefore, we suggest that extension officers work with communities using the *kastom* systems to establish sustainable agricultural practices such as integrated pest management systems, conservation tillage, integrated nutrient management programs, livestock integration programs and water harvesting techniques.

### ***Make use of the knowledge and skills of farmers***

For thousands of years the *kastom* systems of Vanuatu have provided mechanisms for the passing of indigenous knowledge from generation to generation. Indigenous knowledge is local, empirical, holistic and dynamic (Ellen & Harris 1996; Antweiler 2004). Indigenous knowledge is shared orally through the telling of stories and songs (Rao 2006), which has been its strength throughout history. However, in today's society of western education, books, electronic data, and documentation, the strength of indigenous knowledge has become its weakness. Thus, extension officers should focus on developing in-situ knowledge preservation. In-situ knowledge preservation promotes activities which call on the need to preserve indigenous knowledge (Godoy et al. 2005). In order to do this, extension officers must first identify the *kastom* systems and then the agricultural knowledge and skills of the farmers. Extension officers should become involved in *nakamal* meetings and kava ceremonies. It was suggested by an extension officer that extension officers should be from different islands to the communities they enter as being a stranger gives them automatic status and respect.

There are many in-situ indigenous agricultural practices which can be encouraged, as these serve to enhance sustainable agriculture and food security. Due to the constraints of this paper examples from only three areas will be reviewed; cropping, soils and pest management.

Cropping Indigenous knowledge of wind direction guides farmers selection of crops to be planted, as one farmer explains:

We have four directions of wind, two are good and two are bad for us. When the wind is good we know the harvest will be very good, the good wind comes from the south-east and south-west, it will be a good season and good rainfall. When the wind comes from the other direction it affects the crop, this means that there is not enough production to make a ceremony. When the wind is bad, people make a plan to plant wild taro.

In preparation for droughts, farmers will often clear small rings in the jungle or heavily weeded area, approximately two metres in diameter and plant taro, using the soil cover to reduce evaporation rates and retain moisture.

Although many farmers base planting on the Gregorian calendar, some continue to base farming activities based on *kastom* calendars. As an example, villages use environmental indicators for planting and harvest, see Table 3.

**Table 3. *Kastom* calendar**

Month	Natural activity	Agricultural activity
<i>Mariri</i> (April first half)	Yam vines start to yellow	Harvesting of sweet potato
<i>Langisi</i> (April end half)	Headsets of yam rise above the soil	
<i>Taurang Tirigi</i> (May)	Further yellowing of yam vines	Clearing and preparing the new Yam garden
<i>Taurang Lavoa</i> (June)	Complete yellowing of the yam vines	First yam harvest (land diving to celebrate harvest)
<i>Gaidorodoro</i> (July)	Yam vines dry out	Harvest remaining yams, sugarcane, papaya and cassava
<i>Rara memea</i> (August)	Flowering of Dapdap tree ( <i>Erythrina loureirii</i> <i>G Don</i> )	Cleared gardens are burned burnt debris removed
<i>Udu rara</i> (September)	Emerging of the Palolo worms ( <i>Palola viridis</i> ) from the coral reef	Planting of Yam
<i>Udu matala</i> (October)	Peak of Palolo worms population	All plants remain dormant
<i>Udu malageha</i> (November)	New growth, seeds sprout	Pineapple harvest
<i>Bora tirigi</i> (December)	Juvenile fish are plentiful and cicada (Cicadoidea) form under the soil.	Cassava is planted, mangoes are harvested
<i>Bora lavoa</i> (January)	All plants are growing, houseflies ( <i>musca domestica</i> ) are plentiful.	Yams are growing. Bananas, taro and sweet potato are consumed. Prior to these crops being introduced people would rely on the conserved area known as Maliudu. The Maliudu is also an area prepared to support the community during natural disasters.
<i>Ulugaitavu</i> (February)	Yams vines strengthen and grow beyond the stakes	
<i>Vula barai</i> (March)	Yam vines become mature and strong	

**Soils** Farmers are aware of the various soil types and are generally able to name three or four soils in the soil horizon. However, the soils are often known only in the local language, resulting in confusion if English or Bislama soil names are used by extension officers.

Ni-Vanuatu farmers recognise the importance of soil, in fact it is generally termed as 'mother', referring to its role in supplying food to them and their family. There is a general consensus among Ni-Vanuatu farmers that soil fertility has dropped over the past ten years and parallel to this, farmers have also noticed a drop in yields.

Methods of soil improvement are generally based on mulching and growing cover crops, although some continue to practice traditional techniques of adding crushed coral or sea weed and sea grass to the soil prior to planting. Despite these efforts, the shortening of fallow periods among smallholder farmers is fast leading to soil degradation. To cater for shortening fallow periods, some farmers use *Mucuna pruriens* as green manure for fallow as it is easy to remove at the end of the fallow compared to other options such as *Laplap purpureus*.

Farmers also use mixed cropping and crop rotation systems as a means to improve soil fertility. They recognise that planting the same crops in the same gardens leads to poor yields and mixed cropping can decrease pest problems. Mixed cropping provides a logical use of land and labour resources, both of which are limited.

**Pest Management** Pests are an ever-present issue in Vanuatu gardens, however farmers have developed a variety of methods of pest management. Techniques such as border crops, soil mounds and clearing are commonly used to manage pests (Table 4).

There are also many *kastom* practices that villagers believe protect gardens from pests and diseases, as well as improving yield. Following are examples of some of the *kastom* rules for yam gardens:

- Women who are menstruating are not to enter the garden.
- Women who have recently given birth are not to enter the garden.
- No one who has eaten cold food can enter the garden.
- When working in the garden you cannot eat food which has been prepared the previous day.
- You cannot talk to anyone whilst working in the yam garden.
- Men working in the yam garden cannot have sex with their wives the night before planting yam.

**Table 4. Methods of pest management**

<b>Pest</b>	<b>Management technique</b>
Ants ( <i>Formicidae</i> )	Planting spring onion as a border crop
Rats ( <i>Rattus norvegicus</i> )	Placing a border of sweet potato around the garden of yam Building large mounds around sweet potato Placing <i>nangalate</i> leaf around the stem of the plant
Taro cluster caterpillars ( <i>Spodoptera litura</i> ), taro leaf blight ( <i>Phytophthora colocasiae</i> )	Placing the leaf of the <i>Parpar</i> plant in the taro garden Placing ash/spit on the leaves of the taro
Pigs ( <i>Sus</i> species)	Planting of the Coleus plant ( <i>Plectranthus scutellarioide</i> ), known in Bislama as <i>Hoanga</i> , as it shimmers in the moonlight, scaring the pigs.
Yam beetles ( <i>Coleoptera</i> )	Burning and removal of debris

*Use peoples' capacity to work together* *Kastom* connects the past, the present and the future, it provides people with a place, a belonging, a position in society. However, *kastom* only functions to the extent of the community's capacity to work together. Community cooperation remains strong across many communities and it was not uncommon to walk through a village where the entire community was working together to clean an area of the village or repairing the road leading to the village.

Black magic and sorcery is implicit in *kastom* and, at times, is used to repair relationships and maintain social cohesion. For example, if a pig was found to have a sore leg it would mean that the farmer was having an argument, if they apologised, then the pig would be healed. If a garden was doing poorly and the farmer was in dispute, then he would need to apologise to the person he/she was in dispute with and the garden will then improve.

Despite the cooperation within communities, the capacity for different communities to work together is often limited, with trust between communities often strained by conflicts and political rivalries. It is therefore suggested that extension for sustainable agriculture will be better addressed if each community develops its own sustainability plan.

#### **The next step in valuing *kastom***

As evidenced in this paper, *kastom* is a valuable commodity and may provide a mechanism through which extension officers can promote sustainable agricultural development, however it will require shifting the professionalism of agricultural extension. Extension officers would be required to work in two worlds, the political and scientific world of the west and the traditional and spiritual world of Ni-Vanuatu culture. If this could be achieved, extension officers, in collaboration with communities, could develop local solutions to local problems, build community capacity, promote social cohesion and enhance the sustainability of agricultural practices. Such shifts in professionalism will require long-term training, departmental support and improved access to technology, transport and finance.

In the short term there are several techniques, as suggested by extension officers and farmers, which may assist in the transition toward working with *kastom*, including:

- Extension officers should be from a different island than the community they are working with. As an extension officer suggested 'it is easier if you are from a different island, if you are from the same island they may not trust you or have confidence in you, when you come in [from a different island] you come in with a status, someone to be respected'.
- Work with the communities to form councils to take place of the traditional *nakamal* system. Rightly or wrongly, extension officers felt that the youth do not value the *nakamal* system;

however, youth do hold a respect for community councils. The council should be based on *kastom* systems and incorporate local governance structures.

- Investment in technology relevant to sustainable agriculture including using SMS messaging for market prices and weather details.
- Using audio/video to develop a repository of *kastom* knowledge and practices related to agriculture.
- Promote gender equity within communities as a way to value women's role within communities.
- Use kava sessions to build a relationship with the community, as people who do not drink kava are automatically considered an outsider. Kava sessions provide an opportunity for extension officers to learn the local *kastom* systems as well as for the extension officer to share their understanding of sustainable agriculture.
- There are restrictions on who undertakes *kastom* ceremonies, and therefore who receives *kastom* knowledge, but there are other *kastom* methods of accessing *kastom* knowledge, as described by a farmer on the East Coast of Santo:

The *kastom* knowledge is secret, but there is another way, when I plant taro and I ask someone for knowledge, they say 'no its secret for my son', but when you make a *kastom* ceremony [exchange such as pig or mat], you buy this secret because there is a power for this secret, I cannot give it to you, you must make a *kastom*. If there is no *kastom*, then sometimes it cannot work, if the secret is very powerful you can get sick.

Recognising and valuing *kastom* for sustainable development requires a national movement which should include a focus on cultural events which celebrate *kastom* practices, *kastom* knowledge should be embedded into the national educational curriculum and local *kastom* governance systems should be strengthened. To quote a Vanuatu traditional elder from Hickey (2006, p. 21) 'European conservation approaches always seems to cost a lot of money, whereas our traditional system of sustainable management is within our own means'.

#### **Limitations of linking *kastom* and agricultural extension**

Despite the many advantages there are a number of limitations which affect the success of extension approaches that incorporate *kastom* systems to enhance sustainable agriculture.

Firstly, there is the issue of intellectual property, that is, who owns the knowledge and should there be reward for sharing this knowledge. However, in establishing fair and equitable sharing of benefits arising from indigenous knowledge, extension officers may be guided by the Nagoya Protocol (United Nations 2011), a supplementary agreement to the 1992 Convention on Biological Diversity, in particular Article 5 and Article 7.

Secondly is the declining respect in the traditional governance systems. A Church Pastor describes *kastom* chiefs that 'they have become very selfish and full of hate, and they deal unfairly with people, they will always favour some people and not those they are arguing with'. Facilitating the strengthening of *kastom* leadership and governance and facilitating community conflicts will help settle community division.

Thirdly is the decreasing respect for *kastom*. Many farmers felt that the decrease in the respect for *kastom* is being accelerated by the western education systems and the western ideals that urban populations hold. It is suggested that *kastom* practices may gain respect by including indigenous knowledge and activities, which includes involvement of traditional elders, into school curriculum and post school training, although this is also fraught with its own issues.

Fourthly are the failings of current agricultural extension approaches. Departments need to refocus extension approaches from top down to bottom up and from teaching to facilitating. This shift will require re-training and upskilling extension officers.

Finally, is the lack of government funding for agricultural extension programs. Improved funding for transportation, technology and training will significantly enhance the effectiveness of working within *kastom* systems to improve sustainable agriculture development.

#### **Conclusion and recommendations**

As with many Pacific nations, climate change, population growth and shifts to urbanisation in Vanuatu are raising food security concerns. Sustainable agriculture has been identified as a solution to food security, however current top-down agricultural extension approaches in Vanuatu are failing to engage change among farmers. *Kastom* governs agricultural practices and it is argued that by working within *kastom* systems and communities through a bottom-up approach, agricultural extension officers can further promote sustainable agricultural practices.

This paper demonstrated the way in which principles of sustainable agriculture fit within the *kastom* systems. *Kastom* integrates ecological and biological processes, uses non-renewable

inputs, uses farmers knowledge and skills and *kastom* requires the collective capacity to work together, all of which are essential for sustainable agriculture.

By working within *kastom* systems, agricultural extension programs may promote active participation in farmer groups, provide space and time to create new knowledge and develop a trust between farmers to share their knowledge. By respecting farmers' priorities and realities, empowerment and self-determination can be achieved which may also enhance sustainable agricultural practices. Change can come from within communities and *kastom* will no longer simply be a political slogan, however further research into the application of *kastom* in agricultural extension is required.

### **Acknowledgements**

We are grateful for the ongoing support of the Vanuatu Agriculture College, particularly the field assistance of J Tari and L Bouletare. We are indebted to the farmers and extension officers of Vanuatu and their willingness to take the time to share their cultural beliefs, values and traditions with me.

### **References**

- Antweiler, C 2004, 'Local knowledge theory and methods: an urban model from Indonesia' in *Investigating local knowledge: new directions, new approaches*, ed. A Bicker, P Sillitoe & J Pottier, Ashgate Publishing, Burlington, VT, USA, pp. 1-34.
- Bedford, S 2006, *Pieces of the Vanuatu puzzle: archaeology of the north, south and centre*, 23<sup>rd</sup> edn, Australian National University, Canberra.
- Bolton, L 2003, *Unfolding the moon: enacting women's kastom in Vanuatu*, University of Hawai'i Press, Honolulu.
- Convention on Biological Diversity 1994, Text of the convention, Available from: <<https://www.cbd.int/convention/text/>> [15 June 2016].
- Cronin, SJ., Gaylord, DR, Charley, D, Alloway, BV, Wallez, S, & Esau, JW 2004, 'Participatory methods of incorporating scientific with traditional knowledge for volcanic hazard management on Ambae Island, Vanuatu', *Bulletin of Volcanology*, vol. 66, no.7, pp. 652-668.
- Crowley, T 2000, 'The language situation in Vanuatu', *Current Issues in Language Planning*, vol. 1, no. 1, pp. 47-132.
- Davis, K 2008, 'Extension in Sub-Saharan Africa: overview and assessment of past and current models, and future prospects', *Journal of International Agricultural and Extension Education*, vol. 15, no. 3, pp. 15-28.
- Ellen, R & Harris, H 1996, 'Concepts of indigenous environmental knowledge in scientific and development studies literature – a critical assessment, APFT working paper', East-West Environmental Linkages Network Workshop 3, University of Kent, Canterbury.
- FAO 2009, 'World summit on food security', Available from: <<http://www.fao.org/>>, [16 August 2016].
- Forsyth, M 2009, *A bird that flies with two wings: the kastom and state justice systems in Vanuatu*, Australian National University, Canberra.
- Gegeo D & Watson-Gegeo K 1999, 'Adult education, language change, and issues of identity and authenticity in Kwara'ae (Solomon Islands)', *Anthropology and Education Quarterly*, vol. 30, no. 1, pp. 22-36.
- Greer Consulting 2008 'Review of Vanuatu's agriculture extension services', Available from: <<https://www.mfat.govt.nz>> [9 May 2015]
- Godoy, R, Reyes-García, V, Byron, E, Leonard, WR, & Vadez, V 2005, 'The effect of market economies on the well-being of indigenous peoples and on their use of renewable natural resources', *Annual Review of Anthropology*, vol. 34, pp. 121-138.
- Hart, T 2007, 'Local knowledge and agricultural applications: lessons from a Ugandan parish', *South African Journal of Agricultural Extension*, vol. 36, pp. 229-248.
- Harrison, S, Karim, S, Alauddin, M & Harrison, R 2016, 'The contribution of agroforestry to economic development in Fiji and Vanuatu', in *Promoting sustainable agriculture and agroforestry to replace unproductive land use in Fiji and Vanuatu*, eds S Harrison & MS Karim, Australian Centre for International Agricultural Research, Canberra, pp. 9-18.
- Hickey, F 2006, 'Traditional marine resource management in Vanuatu: Acknowledging, supporting and strengthening indigenous management systems', *Traditional Marine Resource Management and Knowledge Information Bulletin*, vol. 20, pp. 11-23.
- International Commission on the Future of Food and Agriculture 2006, *Manifesto on the future of seeds*, Available from: <<http://www.navdanyainternational.it>>, [3 July 2016].
- Jolly, M 2002, *Women of the place: kastom, colonialism and gender in Vanuatu*, Routledge, London.
- Juanwen, Y, Quanxin, W, & Jinlong, L 2012, 'Understanding indigenous knowledge in sustainable management of natural resources in China: Taking two villages from Guizhou Province as a case', *Forest Policy and Economics*, vol. 22, pp. 47-52.
- Kola-Olusanya, A 2012, 'Environmental conservation: Espousing indigenous knowledge system as a model for caring for the Earth', *Journal of Educational and Social Research*, vol. 2, pp. 359-367.
- Lebot, V, Malapa, R, & Sardos, J 2015, 'Farmers' selection of quality traits in cassava (*Manihot esculenta* Crantz) landraces from Vanuatu', *Genetic Resources and Crop Evolution*, vol. 62, no. 7, pp. 1055-1068.

- Lwoga, E, Ngulube, P & Stilwell, C 2010, 'Understanding indigenous knowledge: bridging the knowledge gap through a knowledge creation model for agricultural development', *South African Journal of Information*, vol. 12, no. 1, pp. 174-185.
- McClancy, J 2002, *To kill a bird with two stones, a short history of Vanuatu*, Vanuatu Cultural Centre, Port Vila.
- Miles, W 1998, *Bridging mental boundaries in a postcolonial microcosm: identity and development in Vanuatu*, University of Hawaii Press, Honolulu.
- Radcliffe, C, Parissi, C, & Raman, A 2016, 'Valuing indigenous knowledge in the highlands of Papua New Guinea: a model for agricultural and environmental education', *Australian Journal of Environmental Education*, vol. 32, no. 3, pp. 243-259.
- Radcliffe, C 2017, 'The sustainable agriculture learning framework: an extension approach for indigenous farmers', *Rural Extension & Innovation Systems Journal*, vol.13, no. 2, pp. 41-51.
- Rao, S 2006, 'Indigenous knowledge organisation: an Indian scenario', *International Journal of Information Management*, vol. 26, pp. 224-233.
- Saito, K, Linquist, B, Keobualapha, B, Shiraiwa, T, & Horie, T 2006, 'Farmers' knowledge of soils in relation to cropping practices: A case study of farmers in upland rice based slash-and-burn systems of northern Laos', *Geoderma*, vol. 136, no. 1, pp. 64-74.
- Sillitoe, P 1998, 'The development of indigenous knowledge: a new applied anthropology', *Current Anthropology* vol. 39, no. 2, pp. 223-252.
- Smith, L 1999, *Decolonizing methodologies: research and indigenous peoples*, Zed Books, New York.
- SPC 2011, *Food security in the Pacific and East Timor and its vulnerability to climate change*, Secretariat of the Pacific Community, Noumea.
- Swartley, L 2002, *Inventing indigenous knowledge: Archeology, rural development, and the raised field rehabilitation project in Bolivia*, Routledge, New York.
- VNSO 2009, *National Population and Housing Census*, Vanuatu National Statistics Office, Port Vila.
- United Nations 2015, 'Least developed countries factsheet', Available from: <<http://www.un.org>>, [19 March 2016].
- Welegtabit, SR, 2001, 'Food Security Strategies for Vanuatu', *Working Paper Series 58*, Coarse Grains, Pulses, Roots and Tuber Crops Centre, Bogor, Indonesia.
- Welle, T, Birkmann, J & Rhyner, J 2014, 'World risk index 2014', Available from: <<http://webcache.googleusercontent.com>>, [24 October 2016].
- Williams, D & Muchena, O 1991, 'Utilizing indigenous knowledge systems in agricultural education to promote sustainable agriculture', *Journal of Agricultural Education*, vol. 32, no.4, pp. 52-57.
- Ziembicki, MR, Woinarski, JCZ, & Mackey, B 2013, 'Evaluating the status of species using Indigenous knowledge, Novel evidence for major native mammal declines in northern Australia', *Biological Conservation*, vol. 157, pp. 78-92.