

Some Aspects of the Indigenous Knowledge of Selected Sweetpotato Farming Systems in Irian Jaya

*Hubertus Matanubun, Achmad Rochani, and Agus Sumule**

Introduction

The indigenous population of Irian Jaya consists of nearly 300 ethnic groups, dispersed from the coast up to the mountainous areas (3,100 meters above sea level). The foodstuff situation can be considered quite diverse, due to the diversity of agro-ecosystems and other socio-economic and cultural factors. However, the indigenous people of Irian Jaya can be categorized into three main groups according to their staple food; viz. coastal people, who consume sago and tuber crops, lowland people with sago, banana and tuber crops as their staple food, and highland/mountain people who have tuber crops as their staple food (Karafir 1988; Rochani 1990; Tim Faperta Uncen 1992).

Among important staple foods mentioned above, tuber crops have the widest distribution in Irian Jaya. Of them, sweetpotato is cultivated in almost every agro-ecosystem, and is characterized as follows:

- sweetpotato has been cultivated for generations;
- its scale of production is quite small;
- its cultivation employs simple techniques; and
- it is mostly cultivated for home or subsistence consumption (Rochani 1990; 1992).

Indigenous people residing in the highland areas of Jayawijaya district (Baliem Valley) or Paniai district (Wissel Lakes areas) have developed intensive types of cultivation with unique techniques, such as *Wen Hipere* (Dani tribals in Baliem Valley) and *Bedamai* (Me/Ekagi/Kapauku tribals residing around Wissel Lakes area) (Soenarto 1988; Achmady 1993).

As the indigenous people of Irian Jaya have cultivated sweetpotato for generations, their indigenous knowledge about this crop has also developed and encompasses various aspects, such as knowledge on the varieties of sweetpotato, cultivation techniques, patterns of usage, social values of sweetpotato, etc.

This paper aims to discuss selected aspects of indigenous knowledge of the indigenous Irian Jaya people residing in three areas (Anggi of the Manokwari district, Baliem Valley in Jayawijaya district, and Wissel Lakes area of Paniai district) in sweetpotato farming systems. Based on the information presented, we will try to reflect on sweetpotato germplasm conservation.

* Root and Tuber Crop Research Centre, Cendrawasih University, Manokwari, Irian Jaya, Indonesia.

Aspects of indigenous knowledge system of sweetpotato farming

Agricultural systems

Agricultural systems in Irian Jaya in general can be divided into two types, shifting and settled cultivation. In Baliem Valley and Wissel Lakes areas, shifting cultivation is practiced on the hill slopes and foot-hills area, whereas settled cultivation is performed on valley floors and river banks. In Anggi area, only the shifting cultivation system is practiced, both on mountain slopes and in the flat area.

Both of the above systems of agriculture have been practiced for generations by the indigenous people of Irian Jaya, and can be seen as processes of adapting their needs to the environment in order to produce food. Shifting cultivation is a form of adaptation to low fertility. On the other hand, settled cultivation, with the application of a specific farming technique, such as *Wen Hipere* in Baliem Valley or *Bedamai* in the area around Wissel Lakes, is able to change specific aspects of an unsuitable environment so it becomes suitable for sweetpotato production. This can be seen, for instance, from the reclamation activities which involve digging ditches for better drainage as well as making higher beds.

Other factors which are also important in determining the practice of a specific agricultural system in Irian Jaya are population pressure, population mobility, and the limitation of agricultural land. In Baliem Valley and Wissel Lakes areas, the population pressure is quite high and agricultural land is limited. In contrast, the population density is lower in Anggi even though it shows a tendency to increase, plus the fact that the Sougb tribals native to the Anggi area are semi-nomadic.

Pattern of garden ownership

The patterns of garden ownership among the local people of the three areas discussed in this paper are quite different. In Baliem Valley, the ownership of gardens is basically in each lineage group, since the ownership of the productive land is also on the lineage level. Therefore, being a member of a lineage group, or having a social affiliation with it, is the only way for a person to gain a right to utilize the land owned by that lineage group. Even though the headman (*kepala suku*) has the final say, the decision to open a new garden needs to be agreed upon by the members of the lineage group (Schneider et al. 1993). After each lineage group opens its big garden, each household of that lineage group starts cultivating its own sweetpotato beds. The size of the sweetpotato garden of each household is determined by the intensity of work performed, which is also determined by the amount of labour owned by each household. This is the reason why it is common to find a larger sweetpotato garden owned by a husband who has multiple wives. Besides having sweetpotato gardens in a big garden, each household also opens its smaller sweetpotato gardens, which are usually located on the hill slopes.

In the Wissel Lakes area, sweetpotato gardens are owned individually. This is related to the fact that productive agricultural land is owned individually by the local people (Pospisil 1962). In Anggi, households which are closely related to each other collectively open a big garden. On that big garden area, each household would open its own garden. Even though there is a clear line drawn between family plots, it is not clear to what extent this line shows the real ownership of each plot (Sawer et al. 1993).

Sweetpotato farming systems

Sweetpotato farming systems of each of these three areas are basically determined by the agricultural systems adopted by the people. Therefore there are more similarities to be found between the sweetpotato farming systems in Baliem Valley and Wissel Lakes areas, than in

Anggi (Figure 1).

Besides the differences shown in Figure 1, there are three other differences regarding planting, maintenance and harvesting of sweetpotato in Baliem Valley, Wissel Lakes and Anggi areas, which are worth discussion here. In Baliem Valley, the planting materials (sweetpotato vine cuttings) are planted in mounds on the top of the beds. Usually 3 to 5 cm cuttings from the same variety are planted on the mounds. In the Wissel Lakes area, no mounds are made, but sweetpotato vines (length 1 to 1.5 m) are planted directly on the beds. Besides pushing the end of each vine into the soil, the stem is covered with soil at several intervals. In Anggi area, because no tilling is conducted, the locals use sticks to make holes in the ground before the cuttings of sweetpotato vine are planted.

There are three main maintenance activities in the sweetpotato farming system of Baliem Valley: (i) weeding, which is conducted at least twice during the production process; (ii) nutrient conservation through spreading of the mud retrieved from the closed ditches evenly on the surface of the bed; and (iii) cutting and reversing of sweetpotato vines. In the Wissel Lakes area only weeding is intensively done, whereas in Anggi the weeding activity is a minor activity.

Harvesting of the sweetpotato tubers is quite different among these three locations. In the Baliem Valley, only big tubers are collected, whereas the small ones are left in the mounds. Using this technique, the harvesting can take place between months 10-14. In the Wissel Lakes area, harvesting is conducted once on one to three beds. Usually all tubers are collected. This is one of the reasons why the size of sweet potato beds in Wissel Lakes area is much smaller and shorter than in the Baliem Valley. After each bed is harvested, it is usually prepared for a new planting. In Anggi, each garden of sweetpotato may last up to two or three years, since the harvesting is conducted whenever the vines still bear tubers, until the garden is covered by weeds or forest trees.

Indigenous knowledge and sweetpotato germplasm conservation

Theoretically, indigenous knowledge has two forms of influence on germplasm conservation of sweetpotato, namely that which supports and that which hinders the conservation process. If we analyze this issue within the context of agricultural systems, the settled agricultural system with intensive types of cultivation techniques is capable of maintaining a continuity and speed of the crop cycles, which in turn can maintain the number of accessions of sweetpotato. In contrast, in the shifting cultivation system with non-intensive cultivation techniques, the crop cycle is frequently prolonged and interrupted. As a result, certain accessions disappear at the next planting. This has been proved by the significant difference of accessions available in three areas discussed in this paper. According to Schneider et al. (1993), there are about 224 accessions available in Baliem Valley, whereas in Anggi only about 60 accessions were reported, and this number shows a tendency to decrease (Sawor et al. 1993). Even though there are no hard data available on the number of accessions in Wissel Lakes area, it is estimated that the number would not show much difference with the figure in Baliem Valley.

Besides agricultural systems, there are other aspects of indigenous practices which possibly affect the availability and diversity of accessions, namely maintenance and harvesting techniques. For instance, in the *Wen Hipere* system of settled cultivation, the cutting of the vines periodically would enable the cut vines to be used as planting materials for new gardens. This activity in itself contributes significantly in maintaining the number of accessions of a given area. In contrast, as the indigenous people in Anggi rarely conduct any maintenance activity except weeding, combined with their harvesting technique, there will be

fewer accessions available in a garden which is ready to be fallowed. As a consequence, there are more possibilities for accessions of sweetpotato in areas such as Anggi to be reduced.

Harvesting technique may also contribute significantly to the availability of sweetpotato accessions. As has been stated above, in Anggi harvesting takes place until a given garden produces no more sweetpotato tubers. Since a garden will be left over to be grown with weeds and forest trees, this may negatively affect the availability of accessions in the area. In contrast, harvesting techniques of both *Bedamai* and *Wen Hipere* systems may positively contribute to maintaining and even increasing of sweetpotato accessions. In *Bedamai* system, the harvest is conducted for a whole bed. The vines of the harvested bed would then be used again as the planting materials for the same bed. This means that the number of accessions can be maintained. In the *Wen Hipere* system, only the big tubers are harvested. Up to a point, the whole bed (which is usually much bigger and longer than the beds of the *Bedamai* system) will be tilled, and the planting materials will be brought in from other beds/areas. A large quantity of planting materials is usually needed. As the result, the number of accessions may increase due to this activity. Lastly, there are two more issues that are considered to be important in maintaining and even increasing the number of sweetpotato accessions. The indigenous people of the three areas described here usually plant various varieties of sweetpotato in a given place. This practice may enable cross pollination to take place, which in turn will result in the creation of new accessions. Since in the *Wen Hipere* system there are more accessions than in *Bedamai* and in Anggi systems, it can be concluded also that there is greater possibility of creation of new accessions in the *Wen Hipere* system through cross pollination.

It is also understood that among the indigenous people who practice *Wen Hipere* and *Bedamai* systems, there are customs which influence people to utilize parts of a given variety of sweetpotato for specific purposes, such as for medicine or in certain cultural ceremonies. However, there is an indication also that these practices, especially the cultural ceremonies, tend to be conducted to a lesser extent than in previous times, probably due to modernization and the influence of introduced religion. If this indication is valid, then it can also be concluded that the existence of certain varieties of sweetpotato is under threat, since they may disappear in the future. This situation is also worsened by the fact that, due to limited production in certain areas, people tend to plant sweetpotato varieties which are known to have a high yield, as can be seen in certain parts of the highland of Paniai district, or in Kurima subdistrict of Jayawijaya district.

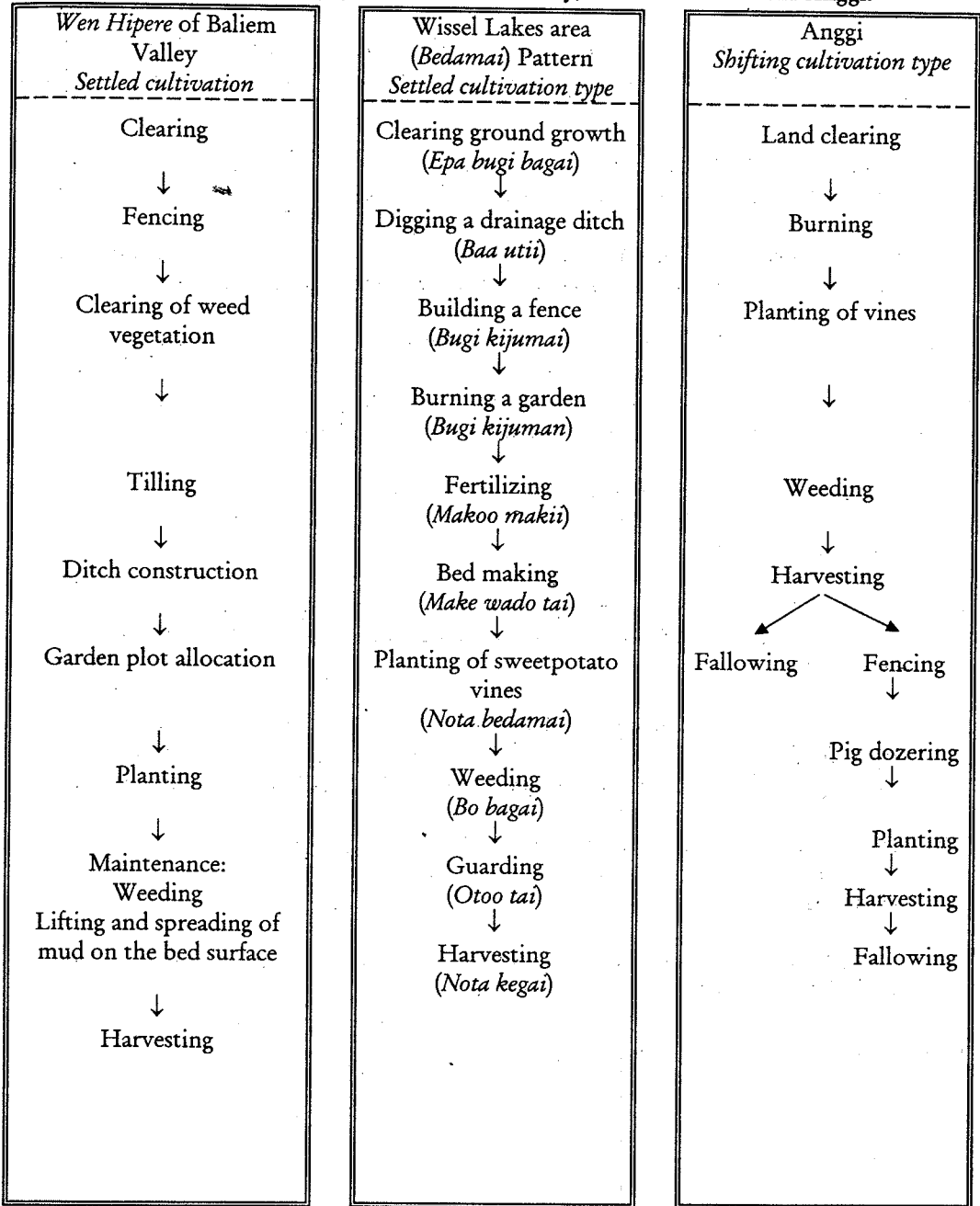
Implication for future development of research on indigenous knowledge

There are two main issues that need immediate attention based on the discussion presented in this paper. These issues need to be incorporated into future work on understanding indigenous knowledge about sweetpotato.

- It appears that our understanding about indigenous knowledge tends to be limited to technical aspects. Non-technical knowledge such as farmers' preferences, decision making processes (including the factors which affect them), sweetpotato status in relation to other indigenous food crops, and socio-cultural values of sweetpotato have not been intensively researched.
- Our research is still focused on the main production areas of sweetpotato, even though, as mentioned above, sweetpotato is cultivated in almost all Irian Jaya ecosystems.

Many of the issues discussed in this paper still need in-depth study. It is therefore important to conduct thorough research on each of those issues so that more comprehensive information can be gained.

Figure 1 Sweetpotato farming systems in Baliem Valley, Wissel Lakes area and Anggi.*



* Adapted from: Schneider et al. (1993), Pospisil (1962), Parinding (1993), and Sawor et al. (1993).

References

- Karafir, Y.P. 1988. *Pola-pola ekonomi pedesaan di Kabupaten Yapen Waropen*. Makalah disajikan dalam Seminar Hasil-hasil Penelitian Indonesia Bagian Timur. LIPI-LEKNAS. Jayapura.
- La Achmady. 1988. *Ubi jalar, jenis kultivar dan sistem pembudidayaan di Lembah Baliem Kabupaten Jayawijaya*. Makalah Seminar Ubi-Ubian Irian Jaya. Manokwari, 27-29 July.
- Parinding, I.C. 1993. *Pola pencuraban kerja pada usahatani ubi jalar di Kecamatan Tigi Kabupaten Paniai*. Fakultas Pertanian Universitas Cenderawasih, Manokwari.
- Pospisil, Leopold. 1962. *The Kapauku Papuans of West New Guinea*. Yale University. USA.
- Rochani, A. 1990. *Analisis usahatani ubi jalar pada masyarakat Suku Ekagi (Kapauku) di Kabupaten Paniai*. Pusat Studi Ubi-Ubian Universitas Cenderawasih, Manokwari.
- Rochani, A. and Pekei, Dominikus L. 1990. *Survey dasar sosio-ekonomi dalam rangka proyek CCAD di Kabupaten Biak Numfor dan Kabupaten Yapen Waropen*. Kerjasama Faperta Uncen dan CCAD/FAO INS/88/011, Biak.
- Rochani, A. 1992. *Pemanfaatan pendapatan tunai rumah tangga petani/nelayan di Kabupaten Baik Numfor and Yapen Waropen*. Kerjasama Faperta Uncen dan Bappeda Tingkat I. Irian Jaya. Manokwari.
- Sawor, Thera, Chadikun, P., Atmodjo, Ery, Situmorang, E.R., Prain, G.D. and Mok, Il Gin. 1993. *Methods for interdisciplinary collection of *Ipomoea batatas* germplasm and associated indigenous knowledge in Anggi, Irian Jaya, Indonesia*. UPWARD, Los Banos, Laguna.
- Schneider, J., Widyastuti, C.A. and Djazuli, M. 1993. *Sweetpotato in the Baliem Valley, Irian Jaya: a report on collection and study of sweetpotato germplasm*. International Potato Centre, Bogor.
- Sonarto. 1988. *Wen hipere, suatu sistem budidaya ubi jalar (*Ipomoea batatas* (L) Lamb.) di Lembah Baliem Irian Jaya*. Fakultas Pasca Sarjana Institut Pertanian Bogor, Bogor.
- Tim Faperta Uncen. 1992. *Survei dasar sosio-ekonomi dalam rangka proyek CCAD di Kabupaten Manokwari dan Paniai*. Kerjasama Faperta Uncen dan Bappeda Tingkat I, Irian Jaya, Manokwari.