

Some Observations on Impacts of Climate Change on Traditional Bee Honey Industry in Sri Lanka

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Collection of bee honey directly from forests is still widely practiced in Sri Lanka, and a significant number of poor families are dependent on income from wild bee honey. The colonies of honey bees (*Apis cerana*) in wild are usually nesting in tree cavities, caves, termite mounds or underground. Currently, the bee honey collection directly from the forests is a common source of cash income for families living in forest buffer zones especially in Uva, North central and Eastern provinces. However, the social, biological and economic dynamics of traditional bee honey industry is poorly understood despite its sensitivity to climate change. It is a challenge to understand the local level climate change impacts on lesser known livelihoods and translate them into policies and practices. The present observations are based on periodic field observations and informal discussions held with stake holders of traditional bee honey industry, opportunistically done at different times during 2010-2014. The informants were involved in gathering and trading of wild bee honey for sustaining their livelihoods. The geographical locations included various villages in dry zone and intermediate zone of Sri Lanka, particularly in Uva, North Central and Eastern provinces where, apparently, the practice of traditional bee honey collection is more common in those areas of Sri Lanka.

Rising temperatures, and occasionally unusual low temperatures, increasingly erratic rainfall, and more frequent and severe droughts and sometimes cyclones all have significant consequences on traditional bee honey industry. Several decades back, some 40-50 years ago, it was not unusual to find 3 or 4 wild bee hives when walking through the forest about 1km. Now, one has to walk some 2-3 kilometers to find a single bee hive in the forests with much difficulty. This clearly indicates the reduced density of bee colonies in the forest. Even if they find one, the quantity of honey volume is less. People attribute such negative consequences to several direct or indirect climate change related factors. Excessive drought conditions exacerbate forest fires spreading over large areas killing wild bees and destroying the hives in large numbers. Where there is a good forest patch, more and more people now explore the area for bee hives. After a severe drought season, farmers affected by crop failures, put more efforts in collecting wild bee honey as a source of cash income. Increasing number of honey gatherers means the viability of wild honey bee population is at stake. Usually, cash hungry people pay less attention to sustainable honey extractive methods

followed by their forefathers who always were careful to use less destructive harvesting practices that enabled recovery of bee hives after a short period. Burning and cutting of trees to collect maximum volume of bee honey severely affect the forest structure making it less suitable for the survival of wild bees. Abundance of mature forest trees with suitable tree cavities is a must for sustaining a healthy honey bee population in forests. Regenerating or disturbed forests with abundance of juvenile trees or shrubs are not the best habitat for wild honey bees. Cutting of trees is not only done by honey collectors, and many people who find difficulties in getting income from agriculture, livestock farming, inland fishery or other small scale rural industries like brick making, becomes part of illegal timber trade for some time of the year when vagaries of climate is severe. Depredation of crops by elephants also become severe during the drought season and put pressure on farming community. All such climate driven human invasions into forests for honey gathering exceed the limit of forest's capacity to produce bee honey sustainably. In addition to dwindling numbers of wild bee hives, the volume of bee honey harvest becomes lower due to several factors. Nowadays, the size of the bee hive has become smaller and said to be a result of lower birth rate of honey bees, death of bees and excessive removal of honey combs and honey comb parts by destructive bee honey collectors.

Destructive honey gathering practice limits the regeneration capacity of hives due to poor hive condition and the strength of bee colony. Burning of hives in tree cavities destroying the tree itself results in total collapse of the hive killing all the mature and immature bees.

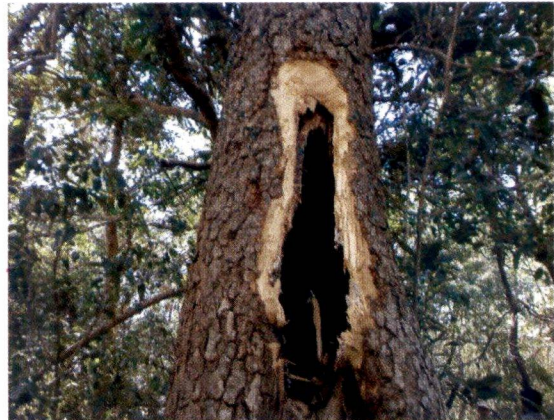


Figure: A severely damaged forest tree after extraction of wild bee honey in destructive manner.

It is well known that bee honey industry is plant life based industry, and bees wholly depend on plants for their food. There are number of important wild plant species providing habitat needs for the best performance of bee hives. Healthy life cycle of bee colony as well as production of honey and wax depends on bee resource plants from which honey bees obtain nectar and pollen as main food. Therefore any undesirable change in plant life in surrounding area of the bee hive put stress on bee colony. Absence of superior bee resource plants like Mora (*Dimocarpus longan*), Weera (*Drypetes sepiaria*), Mee (*Madhuca longifolia*), Palu

(*Manilkara hexandra*), Karanda (*Pongamia pinnata*), Kon (*Schleichera oleosa*) and Madan (*Syzygium cumini*) which are sought

after by illegal timber traders and fire wood gatherers limits the productivity of hives. Climate change mediated spread of invasive plants like Podisinnomaran (*Chromolaena odorata*), Hwarinuga (*Alstonia macrophylla*), Ratathanakola (*Panicum maximum*), Japan jabara (*Eichhornia crassipes*), Salvinia (*Salvinia molesta*) and Hinguru (*Lantana camara*) reduces the resource area for honey bees. Such invasive plants do not sustain healthy wild honey bee population or their honey production. Sometimes presence of certain undesirable flowering plants in the surrounding area results in a bitter taste of honey, and puts a lower market value. The introduced plant *Acacia auriculiformis* planted in barren lands for improving tree cover has become a lethal species for honey bees in account of sticky substances of its flowers, affecting the movement of wings of bees. Usually, there is mass flowering of *Acacia auriculiformis* even during severe drought seasons when other native plants may not produce healthy bloom session under such situation, and that attracts more bees to *Acacia auriculiformis* - a journey to death !. Moreover, climate change vulnerabilities encourage people to clear more natural areas for more food crops, and extensive use of insecticides to control pests. While insecticides directly kill bees, extensive monoculture landscapes like paddy fields are not supportive to wild bees. Hence, the present scenario of traditional bee honey industry demands several field level actions such as;

- Introduce sustainable and less destructive harvesting methods for wild bee honey.
- Promote bee keeping among communities reducing pressure on wild bees and forests.
- Minimize use of insecticides in sensitive localities and promote eco agriculture.- Use bee friendly plant species and establish bee friendly landscapes in available spaces.
- Arrest deforestation.

Finally, it is necessary to mention that professionals will need to become more proactive in future and try to understand local level climate change impacts like traditional bee honey industry more systematically. Honey bees being a valuable pollinator, have an added stake in our economy to the tune of some billions of rupees of agro products. Cushioning of traditional bee honey industry from climate change effects needs proper scientific understanding, public awareness, policy directives, regulatory processes and engagement of land managers as well as local community.

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