

Tobacco cultivation and its effects on forest cover in Amazai union council

Irshad Khan Abbasi ¹

Rasool Mohammad ²

In Buner Virginia tobacco is generally dried in specialized barns. The gradual increase in tobacco production from the 1960s put mounting pressure on the forest. There are about 20,000 tobacco-drying barns in Buner and 3000 only in Chamla Valley where the project operates. Each barn is constructed to cure about 2100 kg of leaves per season from one hectare of land. The leaves contain 80-85% moisture. On an average, 1 kg of cured leaves is obtained by using at least 3.5kg of fuel wood. About 2100 kg of cured leaves consume 7351 kg of wood. Only in Chamla Valley 22050 tons of wood is consumed per season, compared to 147 million tons of wood required in the entire district. Pollutants like CO₂, NO and CO, Nicotine and particulates emit from the barns affecting the clean environment of the valley. In Chamla Valley 36000 cubic meter (7 M. Gallons) and in Buner 200,000.00m³ (47 M. Gallon) moisture per month is produced which is condensed with gases creating acidic action in the air. The tobacco stem, which is generally used as fuel for domestic purpose, has 2-3% nicotine quantity. This way, the nicotine quantity increases enormously in the atmosphere. The ash of stem fuel is also toxic. A total of 54 m stems produced in Chamla Valley (360 m produced in Buner) shows the magnitude of environmental problem. The stems could instead be used for preparing plant-based nicotine sulphate insecticide.



Swabi, Charsadda, Nowshera and Buner districts of NWFP. The climatic conditions of district Buner were ideal for poppy cultivation. People preferred to cultivate poppy as a cash crop in the past since it brought them immense financial returns. As a result of an international campaign against the cultivation of poppy in early 60's, tobacco cultivation gradually replaced poppy cultivation. Tobacco was introduced in late 50's and early 60's in Pakistan. In case of Buner, it took more time, in 1982 as a result of the United Nations funded 'Buner Area Development Project', poppy cultivation



Tobacco is one of the major cash crops of Pakistan, particularly in NWFP. Generally two types of tobacco are grown in NWFP, i.e. Barley and Virginia. Barley is mostly grown in Swat Valley. Virginia is mostly grown in Mardan,

¹Project Coordinator, CBRM

²Regional Coordinator CBRM Buner

was eradicated from the area. Tobacco, with its high returns, was able to provide a good replacement for poppy cultivation.

Tobacco curing process has an adverse effect on forest and environment. Various alternate fuels have been tried but due to high cost, low calorific value and un-sustained supply these are not proved successful. An assignment awarded by CBRM to the Building and Construction Improvement Program (BACIP, an Aga Khan Organization) for energy conservation and design of fuel efficient Barns for curing of tobacco leaves came up with the following conclusions:

A tobacco drying barn is a square shaped structure measuring 16'x 16' or 18'x18' and 16' to 21' high. It is constructed with wood and clay. It is observed that 20% of heat produced at the furnace gets lost at the lid because no insulation is provided. The heat is also lost through wall opening at various stages. The farmers waste a lot of time in changing shifts, as barns take long in cooling down. The process is hazardous to human health due to long exposure to heat and humidity. There is hardly any control over



fuel consumption and the quality of leaves produced is not standardized. The farmers end up losing a lot of produce due to rejected quality and with high cost for drying leaves.

Modification

In order to overcome the above-mentioned problems, the following amendments were suggested in the traditional barns:

- i. Furnace lid should be well insulated so that no heat is lost.
- ii. Burnt bricks with cement plaster and whitewash from inside and mud plaster from outside should be used to control



- the heat loss and also the penetration of moisture during rain.
- iii. Roof should either be lean or pitch slope on both sides for draining rainwater so that condensed drops should not fall over the leaves.
- iv. Floor should be well insulated beneath, water tight and non-absorbent.
- v. Openings and shutters should be air tightened and pivoted at intake and outtake. Doors should have more than two shutters so that it can be used accordingly, each shutter of the size 1'-6" x 7'-0".
- vi. Roof ventilator may be of 12" x 12" and one that can be opened in parts of 2'-0" width.
- vii. The appropriate size of Barn may be 16' x 16' x 18'.
- viii. The leaves holding sticks should preferably be metallic with clamps so that heat can be uniformly applied even near the mid rib.
- ix. Exhaust chimney may be placed inside after proper protection and caging by metallic wire mesh so that the heat remains inside.
- x. Light or white color should be painted over the door and ventilators.
- xi. Inspection window with double plate with vacuum and proper seal should be provided. This will ensure that the doors are opened less frequently for checking how the leaves are doing.
- xii. Damper may be provided at inlet and outlet of furnace chimney respectively.
- xiii. Moistening should be made immediately after completion of

curing. No gap shall be provided, so that in one go the process should go on without any loss of fuel. The amended barn had a quality to quickly bring the temperature down due to ventilation facility.

So far, three such barns have been constructed in selected locations for demonstration purposes. Basically these barns are used in a specific season, however can also be used for storage purposes due to their finished floors and wall. In these barns as per last and current year observations, the following very encouraging results have been achieved.

The local masons were engaged in introducing modification in barns on a demand basis. The carpenters were trained for all woodwork including ventilators, doors and windows. The manufacturers were trained in pipe fixture and metal sheet work involved in the barns including furnace insulated lid etc. However, the passive response of the Tobacco Board and Companies is a major challenge in encouraging replication of barns for adoption on a mass scale. The idea in the following year is to multiply this number to manifolds through various ways, such as:

to provide subsidy to farmers for investing in barns' modifications as their corporate social responsibility.

4. Farmers are linked to SME banks for soft loans on easy terms.



Factors	Improved Barns	Traditional Barns	Remarks
Time consumption for curing 730 chokey of bottom level	84 hours	108 hours	Improved barn takes 22% less time than traditional one
Firewood consumption in mounds	11 mounds	17 mounds	35% less than traditional one
Quality of produce ash	23 kg	60 kg	39% less than traditional one
Moistening in the context of time, labor, & health hazards			Decreased up to 30%. It improved the quality of smoke and reduced Carbon Dioxide emission up to 40% due to complete burning and fuel conservation.

1. Farmers are encouraged to introduce modifications in their barns on their own.
2. The Pakistan Tobacco Board and NWFP Forest Department are approached for convincing them to promote modified barns as a policy for buying leaves. The process has already begun at the Forest Department level.
3. The private sector is encouraged