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- to encourage research in the drylands and the exchange of country and regional experiences, and to link up with the ongoing activities in Africa and the Nordic countries
- to enhance the cooperation between social and natural science disciplines and indigenous knowledge
- to explore the bearing of developmental policies on the environment and the possibility of devising long-term strategies for the redemption of the fragile drylands environment

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Illustration on front:
Details from a decorated gourd (in Nigeria's Traditional Crafts by Alison Hodge)
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THE STATE AND ECOLOGICAL PROBLEMS  
IN KATSINA, NIGERIA

by

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ABSTRACT
An important feature in the Nigerian and African past and recent history has been the environment and its 
continuous influence on the population. This issue is one that is much tied up with the ecological problems 
and the challenges they pose to the population. The problems are those of drought and desertification, 
deforestation, diseases, pest invasions, famine, flood and erosion all of which have been occurring at 
yearly intervals and often with devastating effects on the receiving society. Often, the phenomena have 
involved the sedentary and nomadic populations in local and international migrations in search of food, 
water and other necessities of life. With such major ecological threats resulting either from centuries of 
burning, grazing, farming or from the climatic precariousness and pronounced seasonality of the Sudanic 
savannahs, the socio-economic and political structures would most likely be dislocated. In this instance, 
the stability of the state in power would no longer be at equilibrium.

It is therefore, the aim of this paper to give a historical perspective on the ecological problems 
mentioned above and investigate and analyse the state policies and actions as they relate to Katsina State 
of northern Nigeria from 1987 up to present. How has the State reacted to these challenges and to what 
extent has it succeeded? Why has the State always been obsessed with the question of relief measures? Is 
relief a mere political “gimmick” to earn national and international sympathy and a drive for personal 
aquisition by top state bureaucrats/individuals or an expression of a reality of perennial occurrence in 
the respective region? Has there been purposeful and committed attempts or not to educate the general 
population within the environments to utilize the traditional social methods available to curb the 
m menacing hazards on the ecology and thereby preserve the undisturbed sections?

INTRODUCTION: HISTORY, ENVIRONMENT AND SOCIETY UP TO 1987
Geographically, Katsina State roughly lies on the coordinates of latitude 14°N and 12.5°S and 
longitude 6.5°W and 8°E. The area is situated in the extensive northern plains of Hausaland and has 
an underlying basement of a complex rock system. The climate is of tropical continental type, with 
wet and dry seasons, roughly following the movement of Inter-Tropical Discontinuity (ITD). The 
rainy season generally lasts for about four months starting from June (or sometimes even much 
earlier) to late September. The mean annual rainfall varies from 1150 mm (46") in Funtua to less than 
700 mm (28") in Daura or sometimes even lower than 345 mm (about 17"). From December to 
February the temperature is low because of the dry dust laden winds known as the Harmattan which 
blow south-west from the Sahara desert over the region. In contrast the months of March, April and 
May, when the sun is overhead, produce intense heat which raises the mean annual temperature to 
75°F or even to 37°C (99°F).

The area lies within the Sudanic-Sahel savannah zone with the northern fringes dominated by 
herbs, shrubs and extensively farmed parkland scattered all over. It can easily be seen that by virtue of 
its geographical location, the zone falls within the drought affected belt of West Africa now 
considered an ecological disaster zone.
Pest invasion, Katsina State Local Government Areas (LGAs), Nov. 1989\(^{19}\)

<table>
<thead>
<tr>
<th>LGA</th>
<th>Types of pest</th>
<th>Estimated Hq. affected</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Katsina</td>
<td>G/hoppers/Aphids</td>
<td>Not assessed</td>
</tr>
<tr>
<td>2. Kaita</td>
<td>&quot;</td>
<td>Used 1,800 lit. of fenitrothion</td>
</tr>
<tr>
<td>3. Mashi</td>
<td>G/hopper</td>
<td>550</td>
</tr>
<tr>
<td>4. Mani</td>
<td>&quot;</td>
<td>355</td>
</tr>
<tr>
<td>5. Rimi</td>
<td>G/hopper/Aphids</td>
<td>550</td>
</tr>
<tr>
<td>6. Daura</td>
<td>&quot;</td>
<td>342</td>
</tr>
<tr>
<td>7. D/Ma</td>
<td>G/hopper/Aphids/Bugs and Beetles</td>
<td>Not assessed</td>
</tr>
<tr>
<td>8. Musawa</td>
<td>G/hopper/Aphids</td>
<td>1,200</td>
</tr>
<tr>
<td>9. Zango</td>
<td>&quot;</td>
<td>400</td>
</tr>
<tr>
<td>10. M/fashi</td>
<td>G/hopper</td>
<td>400</td>
</tr>
<tr>
<td>11. Kankara</td>
<td>G/hopper/Cotton stained balluwa</td>
<td>300</td>
</tr>
<tr>
<td>12. Funtua</td>
<td>G/hopper/Aphids</td>
<td>645</td>
</tr>
<tr>
<td>13. Jibiya</td>
<td>&quot;</td>
<td>200</td>
</tr>
<tr>
<td>14. Faskari</td>
<td>&quot;</td>
<td>400</td>
</tr>
<tr>
<td>15. Ingawa</td>
<td>G/hopper</td>
<td>Not assessed</td>
</tr>
<tr>
<td>16. Bindawa</td>
<td>G/hopper/Aphids</td>
<td>&quot;</td>
</tr>
<tr>
<td>17. Batsari</td>
<td>&quot;</td>
<td>&quot;</td>
</tr>
<tr>
<td>18. Safana</td>
<td>G/hopper</td>
<td>&quot;</td>
</tr>
<tr>
<td>19. Kankiya</td>
<td>G/hopper/Aphids</td>
<td>All over the area</td>
</tr>
<tr>
<td>20. Bakori</td>
<td>G/hopper</td>
<td>Not assessed</td>
</tr>
</tbody>
</table>

Source: Courtesy of Technical Department, KTARDA Hqtrs Katsina State.

Flood and Fire Disasters

As if drought and pests invasion were not enough, the flood and fire disasters have also added other dimensions to the ecological problems of the State. Surprisingly enough, in 1989 only about 29 rainy days producing a total figure of 582 mm\(^{20}\) were experienced, yet the whole of Fago village in Daura area was swept away by flood. One cause advanced is that of the lowland nature in which the village was sited. The low gradation always attracts the erratic but often heavy tropical down-pours to flood the flat-laying villages whose drainage is very poor.\(^{21}\) The flood disaster was not limited to Fago only but was also reported to have included substantial areas of Jibiya, Dankama, Mani and Charanci.

In the case of fire-outbreaks the incidence had been minimal through the years. The first quarter of 1991, however, opened with the out-break of fire in the village of Kada in Zango Local Government Area (LGA). Fortunately, this fire incidence was the only disaster so far experienced in the State up to the time of writing this report. The true cause of the fire could not be ascertained but some information attributes it to sheer negligence by some households who did not attend to the fire properly after cooking.\(^{22}\) With the dusty wind blowing and the houses being thatch-made, the village immediately was engulfed by the flames.

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\(^{19}\) Please note that the table presented is not in its original form. For space economy, the details of towns and villages of all the Local Government Areas affected are not included. Anybody interested in the detail can contact me.

\(^{20}\) Official correspondence, Technical Department KTARDA, Katsina State.

\(^{21}\) Individual and group interviews, Fago, Daura, 20/04/1991.

IMPACT OF DROUGHT, PEST, FLOOD AND FIRE DISASTERS IN KATSINA

Apparenty, it seems difficult for one to estimate exactly the effects of drought since they transcend the material and financial figures and include the moral and spiritual sides. Nevertheless, taking the gravity of drought situations, a reasonable degree of estimates after an on-site assessment report could be considered. Undoubtedly, agriculture (cultivation and livestock-raising) for centuries has been the dominant activity of the massive population in this area (more than 85 per cent) of Katsina. The estimated 4.5 million people, 4 million cattle, sheep and goats, and 2 million poultry are supported by only 1.64 million ha of farmland out of a cultivable area of 2.4 million ha. On average therefore, each of the over 800,000 farm families has a holding of 2.5 ha. and seven domesticated animals and poultry.23 If we are to go by the thesis that the land is a limiting factor, it means the farmers have for long been under the constraint to make the best use of what they hold to survive.

With the before-mentioned approximation it is possible then for us to imagine the extent of drought impact in the area from 1987 up to present. The most serious seems to have been the one in 1989 which in particular was a reminder of the 1973-74 and 1981-84 droughts. During this period (1989) the northern parts of the State covering Zango, Daura, Mashi, Mani, Bindawa, Katsina, Jibiya, Rimi and Kaita Local Government Areas were worst hit. The rainfall period in these areas was about 40-50 mm.24 These areas were closely followed by Ingawa, Kankia, Dutsin-Ma, Batsari, Safana and other Local Government Areas. Weather conditions proved very menacing in particular when there appeared an unusual dry wind for more than two weeks in the north. The rainfall was also erratic and poor. In these conditions most of the millet and guinea-corn and other cereal crops ended up with small and poorly grained heads reducing the yield to less than 30 per cent. Due to poor crop yields resulting in poor financial, food and fodder consumption, people and animals alike were put under great stress and peril. While the estimated crop area brought under cultivation in the State in 1989 was about 1,640,000 ha, the loss amounted to N 29,770,860 million. In 1990, the loss as reported was even twice as big, namely N 183,951,610 million.25

On the part of the livestock, especially the cattle, drought has led to problems of shortages in food and water supplies. Water reservoirs which used to attract significant concentration of livestock during the dry and wet seasons, receded to wide distances and to much deeper, narrower and sharper locations, thereby becoming impossible to reach. Close observation of the land indicated its bareness and lack of grass in most of the grazing areas. This reduced the productive pastoral land by over 50 per cent and resulted in lack of fodder and inflated the fodder prices. Consequently, this lack of fodder and water led to the perishing of much livestock. The loss was generally attributed to problematic delivery (dystocia) because of malnutrition, diseases or the Soki factor, slaughter due to starvation and during transportation for sale from the north to the southern parts of Nigeria (Lagos, Ibadan, Enugu etc.).26

With loss being suffered from the serious factors which plagued the entire livestock herds during the drought period, the migration of nomads was accelerated. This in tum has led to the reduction in the prices of livestock, meat and other dairy products, and a reduction of the normal intake of protein by the general populace. The dairy products could not fetch any reasonable amount to the family of the herders to supplement their income as practiced traditionally. Many of the slaughter houses (abattoirs) became empty only to render many butchers out of business, which had serious implications on their families' maintenance. In fact, it was the sedentary stock-owners who were the hardest hit because of their inability to migrate like the nomads to more favourable areas of Niger, Bauchi, Benue and Gongola.27

Associated with the impact of drought on the cultivated crops, people and livestock, there also emerged an accelerated of deforestation and desertification. The tremors sent by drought accelerated human actions over the environment for the sake of survival. In Katsina these human activities involved the cutting down of trees for fuel, buildings and food for animals, overcultivation, reduction of the vegetation cover by the domestic animals.

This occurred because deforestation exposes the layer of the soil for the Harmattan wind to carry the dust over the atmosphere which absorbs the coming radiation of moisture, consequently leading

23 Official correspondence, Technical Department, KTARDA, Katsina State.
24 Ibid.
25 Ibid.
27 Individual interview, Kurfi, Dutsin-Ma LGA, 14/04/1991; group interview, Kaita, Kaita LGA, 05/05/1991.
to less rain. There was also the problem of extensive cultivation which made the soil lose its humus content for the plants. Since the process of desertification was set in motion, the desert began to inch on the land at an alarming rate every year.28

Similar impact also resulted from pest invasions. The impact felt was in the destruction of food crops planted mainly during the rainy season. The destruction was experienced during the dry-season Fadama cultivation, but in most cases it was limited in space and extent. The pest in form of grasshoppers and aphids during the rainy seasons of 1989 and 1990, devoured millet, guinea-corn, cowpea and other plant leaves thereby reducing the capacity of the plants to photosynthesise. While some plants died, others wilted and dried up. The gravity of the devastation covered thousands of hectares of land 29 resulting in a financial loss of millions of Naira. In 1990 alone the estimate of loss reported by the State amounted to over N 183,000,000 million.30

The frequency of flood and fire disasters though not to be equalled with that of drought and pest threats, still produces serious consequences whenever it occurs on the victims and the State in general. One peculiarity of such disasters is the massive destruction especially in thatched villages. The villages of Fago in 1989 and Kada in Zango in 1991 were both razed to the ground. Even though the lives lost were few, those of animals and property and land destruction worth millions of Naira was enormous. The psychological state of despair and the likelihood of disease-outbreak before help arrived also proved problematic in the areas.31

COPING WITH THE SITUATION - THE TRADITIONAL METHODS OF CONTROL

With the failure or cessation of rains the occurrence of drought is inevitable, and the vulnerability of farmers to hunger and other socio-economic and political dislocations becomes more pronounced. The livestock is not spared from these difficulties. And since the farmers and nomads can neither invent rains nor cause it to drop from the sky, or purchase it, the only recourse for them is to cope with the situation. How have they been coping through the years? They have relied mainly on prayers offered to the Almighty God, the ultimate controller of the Universe, begging for His infinite mercy. Thus it has through the years become a common sight in Katsina for one to see people of various age categories troop to open prayer grounds and mosques to pray for rains. Old women, young women and rustics go about in the village and on town roads in tattered dresses, drumming and chanting religious songs calling for rains.32 Other traditional beliefs after consultation by the Chief Priest, the gods, oracles or ancestors have been appeased libations and the sacrifying of livestock.

Though, the prayers in several instances were thought to be efficacious, resort to other practical methods of rain-control were also tried. For instance, where indications for early cessation of rains was observed, harvests on earlier planted crops was done. Areas where late grains appeared, such as in northern Katsina in 1990, re-sowing of millet with guinea-corn and late season cowpea was done. Similarly, farmers have realised the significance of planting short-period and drought resistant varieties of crops. Mashi, Mani and Kaita Local Government Areas have for many years been planting a particular short-period black-eye cowpea known in Hausa as "Dan-Ila mai hula Makka Kusa".33

As far as deforestation and desertification are concerned the situation has been managed in a negligent manner. Individual initiatives exercised towards planting of trees for replacement of the cut-

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28 Field observation, Katsina, Kaita Daura and Jibiya. These areas have considerable portions of them covered by sand. One could observe the virtual absence of trees or even shrubs in wide sandy fields in Daura and Kaita.

29 Please refer to the tables above for details.

30 Official correspondence, Technical department, KTARDA, Katsina State. (Note, the 1990 figures of loss in Naira is a combined one from drought and pest invasions.)


32 Personal experience. I have experienced several years of drought in Katsina and Sokoto. Also as a child in the 1960s I used to join the old women's procession. As an adult however, I now participate in most of the prayers for rain.

33 Group interview, Mashi, Mashi LGA, 15/06/1991. I was also shown samples of this type of cowpea. The phrase literally means that if one wishes to go on pilgrimage to Makkah, then he should plant the cowpea type. Because of the relatively short period of yield and cultivation, one would be able to sell it and fetch good price. With the sale, it is possible to go to Makkah. In short, it is just a joke.
off ones, and to avert desert encroachment, were minimal. During the drought years of 1989 and 1990 the nomads took to cutting down of trees and gathering food from any of their livestock's environment. Cutting down trees to feed the animals has no doubt become a practice in this part of the Sahel without actually considering the consequences. Wells have been dug co-operatively all along the courses of rivers and streams to obtain water for the animals. Rather than castrating the male livestock to reduce poor breeding, many preferred to sell them to butchers and buy food for the rest. However, those who could not afford to reduce their size of livestock migrated to more conducive grazing lands in the Plateau, Kaduna and other States.34

When it comes to pest invasions, there has been local surveillance and dissemination of information through village couriers and gatherings at periodic markets. The grasshopper eggs are normally laid on farm ridges, on the base of old roots, on the base of geza plants, along burtali (communal pasture) and on the roots of fences in the farm. Therefore, the farmers dug out the eggs and destroyed them. The nymphs in their crippling stages fell into dug trenches and subsequently were burnt, covered with earth or killed by the heat of the sun. In the case of aphids, the roots of plants were dug up and destroyed.35 Except in extreme conditions, burning of crops was hardly practiced. Where aphids affected one or two farms, and before spreading to others the neighbouring plot owners congregated to destroy them by chemicals or other methods.

Anti-flood and -fire measures have proved to be more difficult. It is possible, in the case of flood, to transfer the settlement to a safer one (such as hilly type), but the inhabitants of Faga, for example, have refused. The reason for refusing was their conservative belief in not wanting to desecrate their ancestral settlements.36 As regards fire, the best showed to be to ensure that it never even started. Therefore, where it occurred (as at Kada) the inhabitants are now busy giving lectures to their wards to always put out the fire before going to sleep or going out. Localised measures of this nature are being adopted while the State actions still are being sought.

STATE RESPONSES - POLICIES AND ACTIONS TO ECOLOGICAL PROBLEMS IN KATSINA, 1987 TO PRESENT

Whereas the previous section discussed the unofficial measures, this section intends to discuss how the State has responded to the ecological problems. As drought occurred in the years between 1987 and 1990 the State always sent a high-powered delegation to the Federal Government to indicate the seriousness of the situation and also asked for immediate assistance for relief operations. Having been informed by the Technical Department of KTARDA and the Ministry of Agriculture, the State dispatched officials to all the affected areas for an on-spot assessment of the situation. With the creation of the Katsina State Emergency Relief Agency, the Federal Government immediately granted the Agency the sum of N 7 million for assistance to victims of natural disasters. Between 1987-1998 about N 4 million worth of assorted grains was given out as relief. About N 270,000 worth of animal feeds, N 100,000 worth of chemicals, seven water tankers to each of the then 7 Local Government Areas (1 per LGA) and N 500,000 to the State Water Board for rehabilitation of the bore-holes were distributed.37

It is interesting to see that only members of the Agency were responsible for relief distribution. Therefore, before embarking on any endeavour the monitoring committee had to do its assessment of the situation, give a comprehensive price list of items and give recommendations. These steps were always taken in order to avoid clashes of interest between officials of the State and Local Governments. In 1989 and 1990 the Agency claimed that no drought phenomenon had been reported to it, hence it gave out no assistance.38 The State on the contrary remained silent about information pertaining to relief. Such behaviour makes one think about the myth of shrouded state assistance to the deprived. Hence, it goes to prove right the criticism levelled against those responsible saying that, even if aid existed it would be limited only to a few influential herders. Investigations have revealed that most of the farmers, especially those in remote villages, denied ever having received any aid. The

35 Official information, Department of Agriculture, Mani LGA, 14/06/1991.
37 Ibid.
38 Ibid.
State however, was always given the impression that the distribution went smoothly. But, only those who mattered got the aid. Another valid point to take up are the fertiliser rackets of 1989/90 and the present 1991 one which led the State to decentralise the Farmers Supply Company's (FASCOM) powers in distributing to individual LGAs. As reported in one of the dailies (Reporter) sometime in May and June 1991, the fertiliser that was meant for farmers in the State was being sold at N 200 (instead of N 35 only) per bag, and clandestinely smuggled out to the neighbouring Niger Republic.

In analysing deforestation and desertification, one finds the afforestation programme embarked on by the State to be the opposite kind of case. It was implemented in order to arrest the dangerous development of desert encroachment. About four agencies are operating this project since its inception in 1987. The State is assisted by the Federal Government of Nigeria (FGN), the European Economic Community and the World Bank. The EEC/FGN have 25 nurseries, the State 34 and the World Bank 6. Usually over 5 million assorted seedlings are raised annually for the purposes of shelter-belts, woodlots, trees on farmland, windbreaks, extension programmes and tree planting campaigns.

It is interesting to note the commitment of the State in combating desertification through these elaborate projects is strong, but the way in which some of the officials run it remains an enigma. In most of the project reports there is encroachment on the left-over forest reserves and in many areas there is non-participation by the populace. Newly planted seedlings and young plants are often destroyed. At this juncture one begins to wonder whether there is likelihood of connivance with some forest officials in cutting down trees for their financial gains. For example, in Katsina town the massive tree plantation which started from Kofar Sauri and was linked with Kofar Durbi and the rest of it which surrounded the Old City Walls, have all been depleted. The plantations comprised mainly of neem and acacia species. Other species were also included. The plantation also had excellent rows of giginya (borasses palm) trees towering high along the banks of the dried stream. Their number used to be in hundreds, but could now be counted to less than 50. These are rare species in any ecological setting and they are of high economic value in relation to food, roofing materials and environmental beautification. It is really pathetic that they have now diminished. An official inquiry relates this destruction to the local population, but another reliable source associates prior knowledge of the destruction to come from forestry officials. Similarly, the beautifully standing madattai (mahogany) trees along the road from Kofar Sauri leading to the Government Reserve Quarters in the outskirts of the town, have all been cut down. New ones have not been replanted. These plants had long been there, since before Nigerian Independence in 1960 and now are destroyed. All of these actions have turned the afforestation programme by the State into a paradox of development.

On the question of pest invasions one can see exceptionally energetic policies and their execution by the State. Official records of KTARDA and the Ministry of Agriculture were all filled with the issue of chemicals or insecticides for distribution to the affected areas. Whenever surveillance reports reached the headquarters, the State at least provided between 50 to 60 per cent assistance in the form of chemicals. The chemical mostly used is fenitrothion ULV. According to reports it has been found effective in eradicating most of the grasshopper and aphids species in the area. For example in August 1989 when there was an outbreak of pest in Mashi, Mani and Bindawa LGAs, about 430 litres of the chemical was used to control it. Similarly, in the same year (1989) in Zone II of KTARDA, (namely in Daudume, Funtua, Mahuta F, Bakori and Dutsin-Ma) about 800 litres of the same chemical was employed in control. Without any doubt the eradication of pest with chemicals is important, but what about the long time side-effects of its continuous application? From all indications it appears that these chemicals are being over-used for fear of harvest losses. However, it is possible that a time will be reached when the perennial pests may develop immunity to the chemicals thereby resulting in ineffectiveness. What about the problem of increasing acidity and reduced fertility of the soil as caused by the chemicals? The State has a lot of such questions to answer in future. Other forms of action undertaken by the State have been the posting of extension workers on pest control to various

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40 Official information, Forestry Division, Ministry of Agriculture and Natural resources, Katsina state, 17/06/1991.
42 Official correspondence, Technical Department, KTARDA, Katsina State.
affected areas to advise farmers on how to use the chemical spray, and the organising of communal efforts for the destruction of pests.

In the flood of 1989 in Fago, the State Emergency Relief Agency constructed temporary shelters with corrugated sheets for the villagers. About 40 per cent of cash donation was also well given to the flood victims of Jibiya, Dankama, Mani and Charanci. The relief included some food stuffs. The 1991 Kada village fire, after an assessment made by the State, led to the Agency donating 2,000 bags of maize, 620 blankets and N 1 million cash to 310 affected families. Out of the one million naira cash relief, N 250,000 has been released by the State and has already been distributed. In situations where cash is involved difficulties always arise. However during this exercise even the local government officials, who are notorious for corruption, were made to on-lookers. The Agency officials were responsible for handling the cash and kind relief in person to each victim after thorough scrutiny. No State, local government or traditional rulers were involved. This approach was credited to have introduced some sanity in the government circles by making the relief to reach the victims alone.

CONCLUSIONS

Drought, deforestation and desertification, pest invasions, flood and fire disasters are phenomena which have kept re-surfacing in the Sahelian Katsina. At each occurrence, the increase of hardship and pain on the people and animal has been enormous. Therefore, to control or mitigate drought problems both the short-term and long-term measures have to be effected. The short-term measures involve small-scale irrigation schemes, pasture development, earth dam construction and sinking of wells. However, efforts have to be made through Health and Sanitary Extension Workers to prevent the infestation of these water reservoirs which can transfer diseases such as guinea-worm and a host of others. The wells sunk should be cemented at the mouth and covered with corrugated iron or galvanised sheet frames that will not rust nor waste easily. Samples of the water from these reservoirs should be taken periodically to the City Hospital or to the Water Board's laboratories for analysis against infestation.

In case of food support and other relief methods as short-measures, experience has shown that it never lasts. For example, after the 1972/73 drought and the subsequent ones in 1983/84, the then Kaduna State was given aid by the FGN but still asked for more. Katsina State was given relief in 1987/88 (N 7 million) and again asked for more. What is important is that a more serious and permanent containment plan of action should be drawn by the State with a view to solving the problem. Such possible plans of action should include massive food production and storage, water supplies, afforestation programmes, etc. The production of food for animals and human beings alike should not take place without the State developing efficient methods of storage. Therefore, storage facilities such as rumbu (grainary) and modern silos should be constructed. While rumbuna (pl.) are sited in each village under the custody of Magaji (the village head), under or on-the-ground types of silos of considerable size should be constructed in all LGA and State headquarters. The stored cereals and fodder could serve as strategic reserves during drought.

Long-lasting water supplies such as big dams, if rivers are available, and bore-holes should be constructed. It is fortunate in this line of thinking that a new Ministry of Water Resources in the State has been established. The Ministry should be asked to solve this problem of water shortage for the survival of farmers and livestock. If there are problems in this angle even federal and international assistance should be sought by the State. As for the livestock, the over-emphasis often made of massive production through sophisticated technical means, not adaptable to local conditions, should be de-emphasized. The State through its Veterinary Officials should realise the level of technology available to the general population of nomads and farmers and improve on it. Certainly, vaccination to immunise the livestock against diseases such as rinderpest, etc. should be done and survey teams should be on the alert for its outbreak. To improve the health and production of more livestock, large grazing-reserves should be delineated. The pasture grounds should during all rainy season be planted with gamba or Kyasuwa grass for the purpose of fodder for the dry season. Supplementary feed stores with regulatory pricing should be established in many of the areas where cattle concentrate. The feed, if accessible to every nomad, would help alleviate the sufferings encountered during shortages. This is so made because the present system, where nomads trek long distances searching

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for food and water, does not augur well for them and the animals. It is often in this process that
disease-carrying livestock infect healthy ones.

The afforestation programmes, despite lapses in some quarters, should be reviewed and pursued
with extra vigour. The whole practice of “Tree Planting Campaigns” which look more like “Tree
Planting Jamborees” of government officials together with their attendant pageantry, should be
discouraged. Rather a more realistic approach or concept of local mobilisation should be found so as
to put a halt to the wastage of public funds through launching and reception campaigns. The Forest
Extension Workers at local level in alliance with the community could do greater wonders. The
agencies, national and international (EEC, World Bank, etc.), operational in the schemes should
continue to assist towards rehabilitating the deflated forests.

Finally, during fieldwork, an extremely disheartening situation has been witnessed which resulted
from the indiscriminate destruction and uprooting of old and shady trees right from their base. These
trees have formed a canopy all along the major streets of Katsina Town and recently of Sokoto. In the
name of development, through road construction works, these important ecological features are now
being destroyed at an accelerated rate. Road construction companies such as Julius Berger (Nigeria)
Ltd. in Katsina and Roads Nigeria Ltd. and Triacta Nigeria Ltd in Sokoto have all caused considerable
damage. In Sokoto on Birnin Kebbi road, while coming from the airport, more than 90 per cent of the
woodlots, windbreaks and tree avenues have been destroyed by Triacta to create space for road
dualisation. The State should, even before such works start, enter into agreements with the companies
on their paying of compensation and tree replanting. Otherwise, if action is not taken, the construction
companies will leave us with barren lands prone to desert encroachment.

In the case of pest invasions, a very strong and permanent surveillance and monitoring
department should be established. With renumerations and possible provision of transport (bicycle,
motor-cycle, etc.) as incentives, reliable local agents could be created to serve the people. The
traditional methods of destroying egg-pods, uprooting etc. should encouraged. The chemical spray
affair should always be used as a last resort when all other methods have failed. This is important for
the prevention of increasing toxicity of the already exhausted top soil. Chemical fertiliser brands
(super phosphate, NPK, etc.) are now increasing the acid contents of the soil, therefore caution should
be exercised in applying more. It is apparent that this will endanger the quality of food and water and
may even lead to animal infestation.

The flood and fire affair should be tackled seriously by the State through public enlightenment in
public places. In towns through the media, and in villages through the village heads, hamlet and ward
heads, as well as town criers and in periodic market meetings. Where the State observes signs of flood
in the near future, such as of settlements on low and flat-lands, the inhabitants should be re-settled on
uplands nearby. In this way the people will not complain of being moved from their ancestral lands.
As for fire, preventive measures which involve putting it off before going out or to sleep should be
adhered to by the local population. Its out-break should always be reported with utmost haste to
prevent massive destruction.
## APPENDIX

### List of towns and villages affected by pests, Katsina State, 1989

<table>
<thead>
<tr>
<th>LGA</th>
<th>Town/Villages</th>
<th>Types of pest</th>
<th>Estimated Hac. affect</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Katsina</td>
<td>Katsina, Dankama, K/Shaigar, B/Ruga,</td>
<td>G/hoppers/Aphids</td>
<td>N.A.</td>
</tr>
<tr>
<td></td>
<td>Gamjin-Makaho, Yanhoho, Matsai,</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Kagadama, Waige-Waige, Bado</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2. Kaita</td>
<td>Kaita, Danaka, K/Shaigar, B/Ruga,</td>
<td>G/hoppers/Aphids</td>
<td>Used 1,800 litres of</td>
</tr>
<tr>
<td></td>
<td>Gamjin-Makaho, Yanhoho, Matsai,</td>
<td></td>
<td>fenitrothion</td>
</tr>
<tr>
<td></td>
<td>Kagadama, Waige-Waige, Bado</td>
<td></td>
<td></td>
</tr>
<tr>
<td>3. Mashi</td>
<td>Jigawa, Dunya, Babaraini, Sankaya,</td>
<td>G/hopper</td>
<td>550</td>
</tr>
<tr>
<td></td>
<td>Sabuwar-Rijiya</td>
<td></td>
<td></td>
</tr>
<tr>
<td>4. Mani</td>
<td>Bagiwa, Muduru, Tsagem, Mani, Magami,</td>
<td>G/hopper</td>
<td>355</td>
</tr>
<tr>
<td></td>
<td>Jani, Makau</td>
<td></td>
<td></td>
</tr>
<tr>
<td>5. Rimi</td>
<td>Babangaya, Dabagawa, Nasara wa, Makurda,</td>
<td>G/hopper/Aphids</td>
<td>550</td>
</tr>
<tr>
<td></td>
<td>Fardami, Radda, Tokawa, Turawa</td>
<td></td>
<td></td>
</tr>
<tr>
<td>6. Daura</td>
<td>Daura, Isa-kaura, Madobi, Tambu,</td>
<td>G/hopper/Aphids</td>
<td>342</td>
</tr>
<tr>
<td></td>
<td>Sukwanawa, Sharifawa, Daberan, Mai'aduwa,</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Koza, Bumbun, 'Yar'Manuwa, Rada,</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Jakura</td>
<td></td>
<td></td>
</tr>
<tr>
<td>7. D/Ma</td>
<td>Wangarawa, Kuki, Karofi, Birchi,</td>
<td>G/hopper/Aphids/Bugs/Bettles</td>
<td>N.A.</td>
</tr>
<tr>
<td></td>
<td>Dabawa, S/Gari Turare</td>
<td></td>
<td></td>
</tr>
<tr>
<td>8. Musawa</td>
<td>Musawa, Kuru, Faras, Dissi, Gwarjo,</td>
<td>G/hopper/Aphids</td>
<td>1,200</td>
</tr>
<tr>
<td></td>
<td>Jikamshi, Gingin, Danjanku, Magoji,</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Dankado, Sayaya, Karaduwa, K/Waida</td>
<td></td>
<td></td>
</tr>
<tr>
<td>9. Zango</td>
<td>Gamji, Yanduna, Garni, Yardaji, Walawa</td>
<td>G/hopper/Aphids</td>
<td>400</td>
</tr>
<tr>
<td>10. M/Fashi</td>
<td>Rugoji, Tura</td>
<td>G/hopper/Aphids</td>
<td>400</td>
</tr>
<tr>
<td>11. Kankara</td>
<td>Garbi, Ketare, Gundawa, Zango, Mabai</td>
<td>G/hopper/Cotton stained baluwa</td>
<td>300</td>
</tr>
<tr>
<td></td>
<td>Zango, Mabai</td>
<td></td>
<td></td>
</tr>
<tr>
<td>12. Funtua</td>
<td>Funtua, Mahuta, Maska, Gaya, Dandume,</td>
<td>G/hopper/Aphids</td>
<td>645</td>
</tr>
<tr>
<td></td>
<td>Tudun Iya</td>
<td></td>
<td></td>
</tr>
<tr>
<td>13. Jibiya</td>
<td>Gurbin-Baure, Tsanyawa, Bugaje</td>
<td>G/hopper/Aphids</td>
<td>200</td>
</tr>
<tr>
<td>14. Faskari</td>
<td>Faskari, Daudawa, Kwankiro, Kamfani,</td>
<td>G/hopper/Aphids</td>
<td>400</td>
</tr>
<tr>
<td></td>
<td>'Yar Nassarawa, Gazari, Makers, S/Unguwa,</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Tsamiya, Kadisau</td>
<td></td>
<td></td>
</tr>
<tr>
<td>15. Ingawa</td>
<td>Ingawa, Kurfeji, Yandoma</td>
<td>G/hopper</td>
<td>N.A.</td>
</tr>
<tr>
<td>16. Bindawa</td>
<td>faru, Dallaje, Kamri, R/Bade</td>
<td>G/hopper/Aphids</td>
<td>N.A.</td>
</tr>
<tr>
<td>19. Kankiya</td>
<td>Reported outbreak all over the LGA</td>
<td>G/hopper</td>
<td>All over the area</td>
</tr>
<tr>
<td>20. Bakori</td>
<td>Yankwani, Guga</td>
<td>G/hopper</td>
<td>N.A.</td>
</tr>
</tbody>
</table>

Source: Courtesy of Technical Department, KTARDA Hqtrs, Katsina State.
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